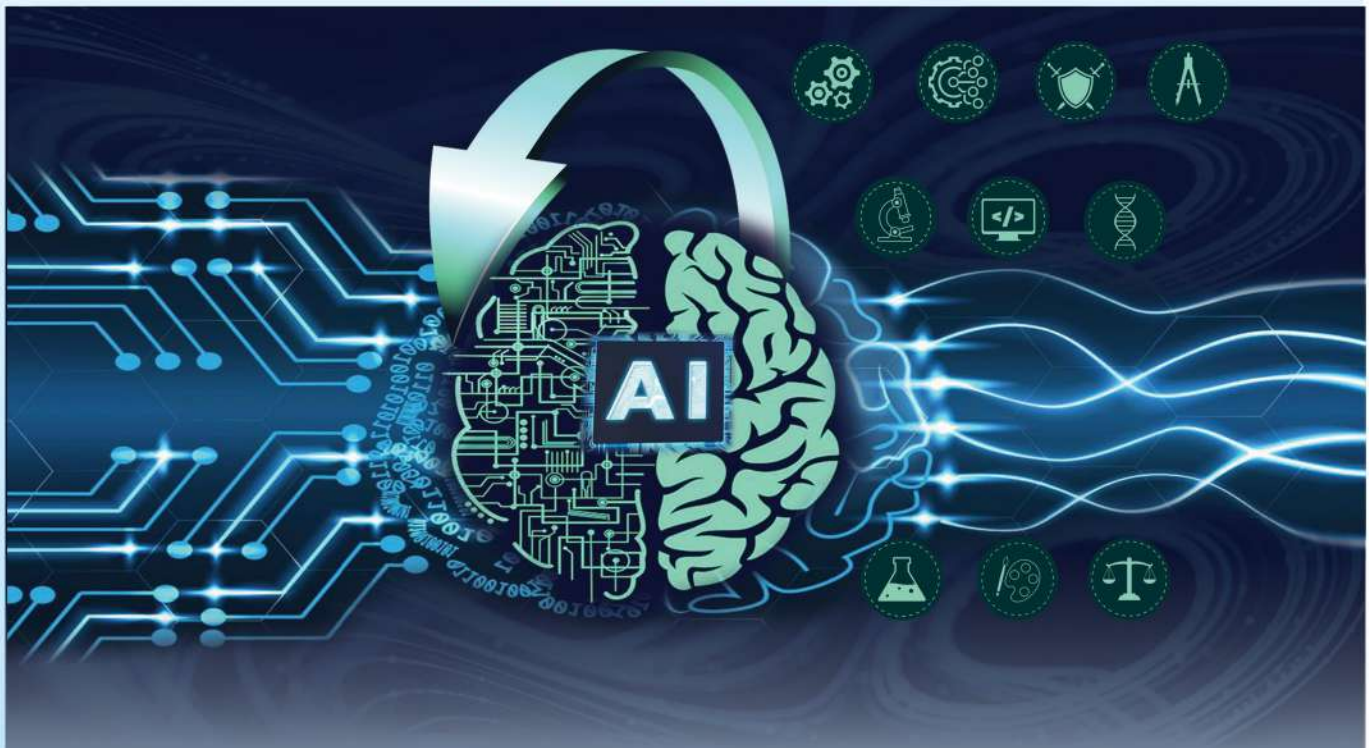**KDU IRC**
INTERNATIONAL RESEARCH CONFERENCE

17th INTERNATIONAL RESEARCH CONFERENCE

Unravelling the Paradigm Shift:
Revolutions in the Era of AI

26TH - 27TH SEPTEMBER 2024

MANAGEMENT, SOCIAL SCIENCES AND HUMANITIES

ABSTRACTS

General Sir John Kotelawala Defence University

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ABSTRACTS

General Sir John Kotelawala Defence University
Ratmalana, Sri Lanka.

KDU PRESS

Message from the Chief Guest

I am truly honoured to welcome all the distinguished participants to the 17th International Research Conference (IRC) at General Sir John Kotelawala Defence University (KDU). This annually organized conference serves as a unique milestone showcasing the rich research culture deeply embedded within KDU. As a prestigious seat of learning, novelty and innovation remain at the heart of KDU's mission. Therefore, 'Unravelling the Paradigm Shift: Revolutions in the Era of AI' has been chosen as the key theme of IRC 2024.

Moving ahead with the momentum of modern-day research, we are set to uncover the extensive impacts of artificial intelligence, not just in defence but across every facet of national interest. Currently, AI has become a driving force, reforming our defence strategies, transforming healthcare, and restructuring our educational frameworks and infrastructure.

Investing in research is essential for national advancement, promoting innovation, formulating policies, and offering solutions that address our most pressing challenges. Hence, the IRC serves as a vital platform that fosters such great endeavours, contributing significantly to national development. Our responsibility as defenders of national security is profound, extending beyond traditional roles to include the ethical integration of advanced technologies that ensure our nation's safety and prosperity.

KDU stands as a symbol of a rich and diverse research culture across many disciplines. It is also a hub for high-quality research, upholding international standards of academic excellence. This conference represents a critical meeting of minds where leading experts converge to define strategies for our future. Each discussion and presentation at this event is a step toward securing a thriving, prosperous future for our region.

I extend my best wishes to all for a successful and productive conference, eagerly anticipating the innovative ideas and transformative insights that will undoubtedly arise.

GENERAL SHS KOTTEGODA (Retd) WWV RWP RSP VSV USP ndc
Chancellor General Sir John Kotelawala Defence University

Message from the Keynote Speaker

Brain health is a holistic concept encompassing cognitive, sensory, social-emotional, behavioural, and motor functions, enabling individuals to achieve their full potential. With one in three people globally affected by a brain disorder, the urgency for preventive brain health initiatives is evident. Since the inception of World Brain Day in 2014, there has been a renewed global focus on this critical area. The World Federation of Neurology (WFN), in collaboration with key organizations such as the American Academy of Neurology (AAN), the European Academy of Neurology (EAN), and the Asian Regional Consortium of Headaches (ARCH), has led the charge to raise awareness and promote brain health worldwide.

This keynote address will outline the journey of World Brain Day and its impact on the global brain health movement, with a specific focus on prevention. It will explore the evolution of brain health concepts and the alarming prevalence of brain disorders, emphasizing the need for urgent, coordinated action. Central to this effort is the role of artificial intelligence (AI) in enhancing preventive brain health strategies. AI-driven technologies are increasingly being used to predict, diagnose, and monitor brain health conditions, enabling earlier interventions and more personalized approaches to prevention.

The address will highlight the author's pioneering work in community-based programs, public health campaigns, and international collaborations. It will underscore the critical role of prevention, early intervention, and AI-powered tools in improving quality of life and reducing the global burden of brain disorders. The ultimate goal is to advance comprehensive brain health initiatives that leverage cutting-edge technologies to ensure a healthier future for all.

Professor Tissa Wijeratne
DR OAM MD PhD FRACP FRCP(London) FRCP (Edin) FAAN (USA) FEAN (EAN) Professor and Chair, Director, Senior Neurologist, Department of Neurology, Western Health, Victoria, Australia Co-Founder and Co-Chair, World Brain Day, World Federation of Neurology

Message from the Vice-Chancellor

Greetings to all participants, speakers, and guests of the 17th International Research Conference (IRC) at KDU. This year's IRC is centered around a timely theme that has sparked diverse dialogues in the realms of research and innovation. The theme, 'Unravelling the Paradigm Shift: Revolutions in the Era of AI', serves as an eye-opener for both eminent and novice researchers across the globe. It also highlights the critical role that advanced technologies play in shaping our world.

At KDU, we take pride in being at the forefront of defence education in Asia, a distinction affirmed by our high rankings and our pivotal role in shaping global security dialogues. KDU claims to have a unique history of providing high-quality education for both military and civilian students. It also proudly stands as a thriving hub for cutting-edge research that addresses pressing global and national issues. We strongly believe in fostering a rich and diverse research culture among KDU's students and staff, aligned with international standards. Therefore, IRC is recognszed as a key event in KDU's annual calendar, emphasizing its significance in the institution's academic and research endeavours.

This year, we aim to explore the revolutionary impacts of AI across diverse disciplines, reaffirming our commitment to leading these discussions on a global scale. The insights shared here will undoubtedly spark new research initiatives and strategic collaborations, enhancing Sri Lanka's stature as a leader in both academic and strategic domains.

I extend my sincere gratitude to all those whose collective efforts have brought this conference to a reality. Your contributions ensure that KDU plays a prominent role in the international arena, driving discussions that will shape the future of technology and strategy. I look forward to a successful event, characterized by insightful discussions and pioneering ideas.

REAR ADMIRAL HGU DAMMIKA KUMARA, **VSV**, **USP, psc, MMaritimePol, BSc (DS)**
Vice Chancellor General Sir John Kotelawala Defence University

Message from the Chairperson

It is my honour, as the Chairperson, to welcome you all to the 17th International Research Conference at KDU. This year, we explore how artificial intelligence has evolved from a technological innovation into a catalyst for transformative change across numerous sectors. With an impressive selection of 441 research papers, drawn from nearly 1000 submissions, our conference spans across 11 distinct tracks covering a wide range of disciplines. Our theme, "Unravelling the Paradigm Shift: Revolutions in the Era of AI," highlights the profound and far-reaching transformations that AI is driving—from reshaping urban infrastructure to revolutionizing healthcare. The conference is designed to promote interdisciplinary dialogue, addressing not only technological advancements but also the ethical, social, and economic implications of these developments. One of our key objectives is to create a platform where researchers, professionals, and thought leaders can come together, exchange ideas, and foster collaborative initiatives that will push the boundaries of innovation. I am deeply grateful to all our keynote speaker and the plenary speakers, other presenters, , participants, and the entire organizing team for their tireless efforts and contributions. Your dedication to advancing knowledge is what brings this conference to life, positioning it as a critical forum in global research. Together, we are charting a path toward a future where technology and society grow hand in hand, reshaping the landscape of not just research but our daily lives. Let's engage in meaningful discussions that will inspire new perspectives and drive impactful solutions. Here's to a successful conference, rich in insight and collaboration. Finally, I would like to extend my best wishes to all the presenters, authors, and participants joining the KDU IRC 2024, whether on-site or online. I hope each of you finds this conference not only informative and enjoyable but also an encouraging opportunity to experience the warm hospitality of KDU throughout these two fruitful days.

Dr. Nirosha Wedasinghe
Ph.D(KDU-SL), MIT(CStud-Aus),B.Sc in Comp IS (London Met -UK), SMIEEE(US), MBSC(UK), MCS(SL), FISDS(Japan) Senior Lecturer cum Director -Centre for Gender Equity and Equality General Sir John Kotelawala Defence University Conference Chair-IRC 2024

Message from the Secretary

As we gather for the 17th International Research Conference at KDU, I extend a warm and heartfelt welcome to all participants, researchers, and thought leaders. This year, we proudly present 441 research papers selected from nearly 1,000 submissions, spanning across 11 tracks in diverse fields such as Defence and Strategic Studies, Medicine, Health Sciences, Engineering, Technology and Computing, Basic sciences, Law, Social Sciences and Humanities, and the Built Environment and Spatial Sciences. Our theme, "Unravelling the Paradigm Shift: Revolutions in the Era of AI," reflects the profound ways that AI is transforming our world, becoming integral to our lives and work. The discussions here aim to explore how AI can address global challenges, drive innovation, and foster interdisciplinary collaborations that will shape the future. Looking ahead, the future of IRC lies in broadening its horizons. We aim to increase international participation, diversify the scope of research, and establish global research consortia to tackle real-world problems that extend beyond the borders of Sri Lanka. The insights gained here must lead to actionable outcomes, particularly in formulating policy recommendations in areas such as AI in defence, public health, and education. This conference is more than just a forum for discussion; it is a platform where the brightest minds collaborate to drive change. I extend my heartfelt thanks to all our speakers and participants for their dedication and contributions. Together, we are not only shaping the future of research but also crafting solutions that will impact society on a global scale. Here's to a successful and inspiring conference that drives innovation, shapes policy, and sparks meaningful collaboration.

Dr. HM Prasanna Herath
Ph.D. (USJ), RN(SLNC), B.Sc(Nursing) Hons (UPSL), CTHE Senior Lecturer Faculty of Allied Health Sciences Erasmus coordinator General Sir John Kotelawala Defence University Conference Secretary- IRC 2024

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ORAL PRESENTATIONS

Optimizing Cold Chain Management in Sri Lanka's Pharmaceutical Industry: A Fuzzy Logic Approach to Enhancing Transportation and Storage

TD Sooriyaarachchi[1#] and DR Perera[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]dulanjalee.s@kdu.ac.lk

In the logistics industry, the cold chain system plays a major role in ensuring the quality and safety of temperature-sensitive products such as pharmaceutical items and other perishable goods (Vukašin et al., 2024). This study focused on analysing how to optimize Cold Chain Management (CCM) within Sri Lanka's private sector pharmaceutical industry with an emphasis on storage and transportation. Rout (2024) indicates that the high costs associated with the cold chain process, transportation and storage inefficiencies, lack of skilled professionals, and regulatory inconsistencies can hinder efficiency and complicate operations. The objective of the study was to analyse how to enhance the decision-making process and reduce product spoilage during storing and transporting functions while ensuring that medications reach patients in optimal condition and protect the merchantable quality. Through a comprehensive literature review, the key variables were identified, the use of the fuzzy logic framework was highlighted, and the challenges in maintaining the quality were addressed. The study contributes to the existing body of knowledge by applying this novel methodology which can be used by any developing country that has logistical challenges and other limitations. The findings give practical insights into the concerns of the decision-makers providing a blueprint focusing on travel time, packaging, skillful personnel, temperature maintenance, and infrastructure availability. The study couples two intangible benefits and identifies three extended benefit scales such as low, medium, and high. In conclusion, the effective use of fuzzy logic in enhancing CCM offers an adaptive and structured method for improving product quality and provides a valuable tool for improving the management of temperature-sensitive products.

Keywords: *Cold Chain Management (CCM), fuzzy logic, pharmaceuticals, transportation, storage, private sector*

ML-Powered Application For Predicting Flight Delays: Insights From Sri Lankan Airlines

GVY Anuththara[1#] and DR Perera[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]Yasasi.a@kdu.ac.lk

Flight delays in Sri Lanka's aviation industry significantly impact operational aspects, finances, and passenger satisfaction. Factors such as maintenance issues, weather conditions, airport congestion, and air traffic flow contribute to delays. A prediction system can replace the traditional method used to analyze delays with ML algorithms including Cat Boost and others. ML is a subset of artificial intelligence that uses technology to minimize the consequences of flight delays. Literature verified that a predictive model can deploy proactive actions to minimize delays. The study objectives were to analyze variables and identify where ML adoption is required to mitigate flight delay repercussions using fuzzy logic theory. Fuzzy is used to quantify the qualitative benefits of the airline industry concerning the degree of occurrence of delays. We utilized two sets of couple variables to realize the flight status through the fuzzy logic approach. The results were categorized into five fuzzy linguistic variables in flight status: late, very late, moderately late, cancelled, and on-time performance, evident in several specific study cases. Based on these findings, the study proposes utilizing machine learning (ML) algorithms associated with the fuzzy logic system to predict flight delays with two primary outcomes: delayed or cancelled. The study concludes that an ML-powered predictive system for robust air operations is essential. It will augment cost savings and customer satisfaction in the aviation industry in Sri Lanka. The algorithm and the model deployment in the other fields of logistics are futuristic.

Keywords: *artificial intelligence (AI), flight delay, machine learning (ML), fuzzy inference system, benefits realization*

Predictive Model to Identify the Productivity of Colombo Port Based on Ship Movement

CH Liyanaarachchi[1#]

[1]Ocean University, Sri Lanka

[#]charith.liyanaarachchi@gmail.com

Transportation significantly impacts national development, influencing both national integration and the global economy. The maritime industry, especially ports and terminals, plays a pivotal role. The Port of Colombo, a key transshipment hub on the main international shipping route, is crucial for international trade. It comprises a state-owned terminal (Jaya Container Terminal) and two privately owned terminals (South Asian Gateway Terminal and Colombo International Container Terminal), each with varying facilities and productivity levels, influencing demand from shipping lines. This study analyzed 300 terminal performance reports from these terminals, focusing on berth productivity, vessel productivity, and crane productivity. Data analysis was conducted using Google Colab, employing graphical interpretations, descriptive statistics, multivariate analysis, ANOVA tests, linear regression, and five prediction models to calculate productivity at all three terminals. The findings indicated a significant impact of crane productivity, berth productivity, and vessel productivity on terminal performance. Further investigation revealed that waiting time significantly affects crane productivity. Additionally, it was found that optimizing crane scheduling and reducing vessel turnaround time can further enhance terminal productivity. Results showed that CICT has superior crane productivity compared to JCT and SAGT.

Keywords: *productivity (BP/CP/VP), regression models, waiting time*

Enhancing Port Competitiveness through Digitalization and Sustainability Initiatives: The Case of Port of Colombo

SACP Subasinghe[1#] and WWAS Fernando[2]

[1]Staff Officer I (Repair), Naval Headquarters, Colombo 01, Sri Lanka
[2]Department of Transport Management and Logistics Engineering, Faculty of Engineering, University of Moratuwa, Sri Lanka

[#]subasinghe2009@gmail.com

Digitalization makes port logistics activities more competitive in the maritime supply chain. The main objective of this study was to identify the impact of the directions of digitalization on port competitiveness in the presence of sustainable initiatives in the port of Colombo. The study focuses on five main directions: automation, connectivity, ICT, safety and security, and environment management, and investigates the impact of these directions on port competitiveness using regression analysis. The mediating role of sustainability initiatives has also been analyzed through the Hayes Process Macro. Data was gathered from the most relevant parties in the maritime logistics service, such as the shipping line, SLPA, SL Customs, and terminal operators in Colombo port. Results show the positive influence of these directions, and ICT, safety and security were the ideals among these directions. Automation, connectivity, and environmental management impact port competitiveness through sustainability initiatives due to the full mediation effect. Also, the impact of ICT, safety, and security on port competitiveness is partially mediated by sustainability initiatives. Both have direct and indirect relationships with each other. Considering the higher level of impact of sustainability initiatives on port competitiveness, the study can conclude that the port operation is aligned with sustainability in the Colombo port. However, automation, connectivity, and environment management need more concern by developing infrastructure, investment, governance practices, trading partnerships, legal frameworks, and capacity building in port of Colombo.

Keywords: *digitalization's directions, sustainability initiatives, port competitiveness, port sustainability*

Leveraging Artificial Intelligence for Human Resource Management in the Sri Lanka Navy: A Bibliometric Analysis

HK Dassanaike[1#], YA Iddagoda[2], and H Dissanayake[3]

[1]Sri Lanka Navy
[2]University of Sri Jayewardenepura, Sri Lanka
[3]Wayaba University, Sri Lanka

[#]hasantha.dassanaike@gmail.com

This study aims to identify the primary topics and present dynamics in the field of Artificial Intelligence (AI) and Human Resource Management (HRM) and make recommendations for improving the HRM mechanism integrating AI. A bibliometric analysis was conducted on a selection of 505 studies from the Web of Science database to determine how AI is linked to HRM from 1996 and 2024. In this study, researchers identified the most influential articles and writers based on their citations, publications, and geographical locations. Additionally, it identified how they assess existing themes, identify concerns for growth in the literature, and recommend future study options. This study had six objectives relating to the review of articles discussing AI and HRM: to determine the direction of articles, which journals are leading in the field, the pioneer authors on the subject, the total number of publications, increasing trends, and international distribution, which papers have the greatest impact on citations, and to find the pertinent author keywords. The literature review was carried out by examining highly cited relevant articles from the Web of Science. The bibliometric analysis found two main research gaps. The paper concludes by proposing future studies and recommendations.

Keywords: *artificial intelligence (AI), bibliometric analysis, Human Resource Management (HRM), leverage*

Balancing Academic and Professional Responsibilities: An Exploration of Stress Factors Among Full-Time Working Undergraduates At General Sir John Kotelawala Defence University, Sri Lanka

AHE De Silva[1#] and L Liyanage[2]

[1]Faculty of Graduate Studies, General Sir John Kotelawala Defence University, Sri Lanka
[2]Faculty of Management, Social Sciences and Humanities, General Sir John Kotelawala Defence University, Sri Lanka

[#]hashinidesilva1998@gmail.com

This study examined multiple stressors affecting undergraduate students who are balancing full-time employment with academic commitments. Using an exploratory, qualitative methodology, the study examined the academic, personal, socio-cultural and economic stressors experienced by students enrolled in the weekend BSc in Management program at General Sir John Kotelawala Defense University. The study's data collection included nine semi-structured interviews, and purposive sampling was used to gain a deeper understanding of the lived experiences of these students. Theoretical frameworks by Selye and Folkman underlie the study, highlighting stress as a physiological and cognitive response to various demands. The purpose of this study was to identify specific stressors, their impact on participants' academic success rates and the current mental health and coping strategies of the participants. These aspects are useful in formulating institutional policies and service support to eliminate stress and enhance the overall performance of students. The results of the study are useful to educational institutions, managers, industries, and policymakers. In addition, the study contributes to the broader discourse on student mental health, particularly in the context of full-time working professionals studying/ pursuing higher education. Regardless of its contributions, the study acknowledges the inherent limitations of qualitative research, and by addressing these limitations, it aims to provide a solid foundation for future studies and practical applications to improve the academic and professional experiences of working undergraduates.

Keywords: *coping strategies, psychological wellbeing, stress factors*

Exploration of the Problems Faced by Cargo Operations in Sri Lankan Airlines

GKG Balasuriya[1#], LPDAS Pathirage[1], and NT Sirisoma[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]39-blm-0006@kdu.ac.lk

In the dynamic realm of supply chain and logistics in the digital age, this study aims to explore the operational challenges within Sri Lankan Airlines cargo operations and propose strategic solutions to enhance operational efficiency. The study focuses on three pivotal areas: documentation, handling perishable cargo, and digitalization. This qualitative study employed thematic data analyses, gathering data by conducting interviews with the Sri Lankan cargo operations management team where a purposive sampling technique was used. Documentation bottlenecks were discovered, emphasizing excessive paperwork, rigorous evaluations prone to human errors, and communication gaps leading to fines. For perishable cargo, challenges such as the absence of a cold chain management system, limited freezer areas, and inadequate storage were identified. Digitalization barriers include outdated tracking systems, lack of cargo checking machines and communication challenges during SLACDP system implementation. The study highlights the urgent need to streamline operations and adapt to the digital era. Proactive recommendations support adopting e-AWB, electronic signatures, and unified communication platforms to revolutionize documentation processes. Upgrading the automated temperature monitoring system is proposed to ensure real-time data alerts for perishable cargo. Collaborations with airlines and freight forwarders are recommended for a steady supply of containers, overcoming space constraints in the cargo warehouse. The need for a modern, cloud-based cargo tracking system and automation tools is emphasized, recognizing the current technological constraints in the developing country context. For future research, the study suggests exploring diverse samples, conducting quantitative studies, and extending the focus beyond a single airline or country.

Keywords: *digitalization, documentation, perishable cargo*

Assessing the Perceived Logistics and Spatial Feasibility of Establishing an Export Processing Zone in Trincomalee, Sri Lanka

S Lakshan[1#], MKN Dulanjalee[1], MSF Shazika[1], and AHS Sharic[1]

[1]General Sir John Kotelawala Defence University

[#]39-blm-0031@kdu.ac.lk

This study assesses the feasibility of establishing an Export Processing Zone (EPZ) in Trincomalee, Sri Lanka, by evaluating the perceived logistics and spatial feasibility, based on insights from an expert panel. The research focuses on key factors such as transportation infrastructure and land suitability, using a structured framework. The expert panel's perceptions were critical in assessing the overall and component-wise viability of creating an EPZ in Trincomalee, with their evaluations informing the calculation of the Perceived Logistics and Spatial Feasibility Index (PLSFI). Trincomalee demonstrated strong potential, achieving a PLSFI score of 0.67, closely aligning with the established Katunayake EPZ's score of 0.68. The expert panel identified strengths in Trincomalee's road infrastructure, effective rail system, port services, and a well-structured land use plan, with a focus on sustainability. However, challenges such as moderate transport growth were noted. The study concludes that, based on the expert panel's perceptions, Trincomalee has significant potential to become a competitive EPZ, contributing to Sri Lanka's economic growth. It is strongly recommended that policymakers prioritize the development of the Trincomalee EPZ, with a focus on enhancing transportation networks and attracting strategic investments to capitalize on the region's logistical advantages.

Keywords: *Export Processing Zone, Perceived Logistics and Spatial Feasibility Index, Trincomalee*

Enhancing Educational Outcomes: The Role of Instructional Leadership in Education Management

AS Thennakoon[1#]

[1]Department of International Studies, Faculty of Social Sciences, University of Kelaniya

[#]anjali$_2$023@kln.ac.lk

Instructional leadership plays a crucial role in shaping educational outcomes by influencing teaching practices and student learning. Traditionally, instructional leadership has been defined by direct involvement in curriculum development and classroom instruction. The study addresses the challenge of understanding instructional leadership in contemporary educational contexts, where leaders must balance direct instructional involvement with broader organizational responsibilities. The primary objective is to explore how instructional leaders can effectively combine traditional hands-on instructional support with strategic organizational management to enhance educational outcomes. This study identifies a research gap in how instructional leaders can balance these direct instructional roles with broader strategic organizational management responsibilities. To address this gap, the study employed a comprehensive literature review and analysis of educational leadership practices to explore the multi-layered role of instructional leadership in education management. It also conducted an analysis of existing empirical studies and theoretical frameworks to examine various educational leadership practices. The analysis reveals that instructional leaders who integrate direct classroom support with proactive organizational strategies, such as teacher recruitment, professional development, and resource allocation, are more effective in promoting sustained educational improvement. Effective instructional leadership transcends traditional boundaries by integrating proactive organizational management strategies. Principals who adeptly navigate these dual roles enhance educational outcomes by creating supportive environments where teaching excellence thrives. The study concludes that instructional leadership must go beyond traditional methods, advocating for a holistic approach that merges instructional expertise with strategic management practices to optimize student learning and school performance.

Keywords: *instructional leadership, curriculum development, organizational management, classroom, education management*

Comprehensive Analysis of Global Crude Oil Market Dynamics: Leveraging Hierarchical Clustering to Explore Country-Level Patterns and Strategic Decision-Making Trends

RSP Ranasinghe[1#], AHDB De Silva [1], and HSC De Silva[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]39-adc-0043@kdu.ac.lk

This study delivers an in-depth analysis of the global crude oil industry, focusing on unveiling complex patterns in production, exports, active oil rigs, and demand dynamics from 2012 to 2022. The study addresses the significant challenges of various factors, such as market conditions and geopolitical tensions, influence the industry. This study employs hierarchical clustering and robust statistical techniques to identify distinct groupings of countries based on their rig count dynamics, production patterns, and demand. The analysis reveals that these groupings are closely tied to market volatility and geopolitical events, offering a nuanced understanding of the global crude oil industry. Additionally, the study examines varied consumption trends across different regions, highlighting the impact of divergent energy policies and economic growth trajectories. The findings suggest that these trends are crucial for stakeholders looking to make informed strategic decisions in fluctuating market conditions. By offering a comprehensive examination of the global crude oil market, this research contributes valuable insights that can aid in navigating the industry's inherent volatility. The study emphasizes the importance of comparative studies and reserve distribution analysis, suggesting that these approaches are essential for understanding the broader implications of global oil dynamics. Ultimately, this study provides a critical foundation for stakeholders to enhance their strategic planning and decision-making processes within the complex global crude oil market.

Keywords: *global crude market dynamics, hierarchical clustering analysis, crude oil industry*

Audit Committee Characteristics and Firm Performance Measured by Return on Assets: A Study on Listed Food, Beverage, and Tobacco Companies in Sri Lanka

Jethusan J[1#] and Premi P[2]

[1]University of Colombo, Sri Lanka
[2]University of Peradeniya, Sri Lanka

[#]jethusanjeevakumar@gmail.com

One of the essential components of the corporate governance framework that aids in regulating and overseeing management in the company is the audit committee. The purpose of the research is to investigate the impact of audit committee on the firm's performance. This study used a quantitative method to analyse how listed Sri Lanka food, beverage and tobacco companies fared in terms of their audit committee performance. Thirty publicly listed food, beverage and tobacco companies in Sri Lanka made up a sample from 2017 to 2021. In this study, data were gathered from secondary sources, and multiple regression analysis was used to investigate the hypotheses. According to the finding, audit committee characteristics like audit committee size and audit committee meetings have a significant impact on return on assets. Also, specific audit committee traits in Sri Lanka are important for a company's performance in terms of Return on Assets especially with regards to food, beverage, and tobacco industries. The results will be useful to regulators in other countries who are looking for ways to increase the effectiveness of audit committees, overall firm governance, and investor trust in the firms.

Keywords: *audit committee, return on asset, listed Companies*

ID 632

Exploratory Study on How Short Video Platforms Affect Gen Z's Purchasing Intention for Electronic Devices in Colombo District

AWHMDT Bandara[1][#] and MMLC Gunathilake[2]

[1]Faculty of Graduate Studies, Sir John Kotelawala Defence University, Sri Lanka
[2]Faculty of Management, Social Sciences and Humanities, Sir John Kotelawala Defence University, Sri Lanka

[#]dilshanbandara9452@gmail.com

The study investigates the impact of short video platforms (SVPs) on the purchasing intentions of Gen Z consumers in the Colombo district, specifically regarding electronic devices, through a detailed analysis. With the objective of identifying characteristics of short video platforms (SVP) that affect purchasing intention for electronic devices of Gen Z consumers in Colombo district, a quantitative method was used via structural questionnaires to collect data from 142 Gen Z participants. The results indicate that despite SVP relevancy for Gen Z, simple usage positively does not lead to the growth of purchasing intentions. The characteristics and quality of content significantly affect purchasing behaviors; more so, elements such as influencer marketing and brand accessibility on SVPs, with influencer endorsements appearing more natural and unscripted, make it the most effective way of consumer persuasion against previously dominant advertising approaches. In addition, engaging brand presence as well as the general quality of content contributes to the SVPs helping in creating positive brand attitudes with Gen-Z consumers. These findings have certain managerial implications for the companies interested in targeting Generation Z consumers through the appropriate online media advertising that responds to the specific characteristics of this 'digital native' generation.

Keywords: *Gen Z, purchasing intention, short video platforms, social media influence, User Generated Content (UGC)*

Adoption of Digital Marketing by Micro-Entrepreneurs in Gampaha District, Sri Lanka

MAKR Mudannayaka[1#] and L Gunathilaka[1]

[1]Department of Management and Finance, General Sir John Kotelawala Defence University, Sri Lanka

[#]k.mudannayaka@gmail.com

Despite the growing importance of digital marketing, research specifically focusing on its adoption by micro-entrepreneurs in Sri Lanka is limited. This study addresses this gap by exploring how environmental, organizational, and technological factors (TOE framework) impact the adoption of digital marketing strategies among micro-enterprises in the Gampaha district. Data were collected from 384 micro-entrepreneurs using structured surveys and analyzed with SPSS. The TOE framework was utilized to assess the impact of various dimensions on digital marketing adoption. The analysis revealed that the TOE dimensions account for 75.2% of the variance in digital marketing adoption, with organizational factors having the most significant impact (= 0.596). Specific organizational factors, such as readiness and resource availability, were particularly influential. The findings highlight the critical role of organizational readiness and favorable environmental conditions in adopting effective digital marketing strategies. Management implications include the need for secure data practices and tailored digital strategies to enhance market responsiveness and competitive advantage. This research fills a significant gap in the literature, providing valuable insights for microentrepreneurs, policymakers, and future researchers by identifying key factors that facilitate or hinder digital marketing adoption. Future studies should explore these findings across different industries and incorporate mixed-methods approaches to deepen the understanding of digital marketing's impact on microenterprises.

Keywords: *micro entrepreneurs, environmental dimension, Organizational dimension, technological invention, TOE framework, adoption of digital marketing*

Adoption and Usage of Social Media as a Marketing Tool for Long-Distance Bus Operations in Sri Lanka

KT Vimukthika[1#] and TM Pathirana[1]

[1]Edith Cowan University, Sri Lanka

[#]t.kelaniyage@ecu.edu.au

This study investigated the use of social media as a marketing tool by long-distance bus operators in Sri Lanka. Despite the potential for enhancing customer engagement and service delivery, social media adoption in the Sri Lankan public transport sector remains limited. Through qualitative research, this study identifies key barriers to using social media for this purpose, including low awareness, perceived high costs, and a lack of technical expertise. The study applied the Technology Acceptance Model (TAM) and the Diffusion of Innovations Theory to analyze these factors. The findings suggest that effective social media usage can improve passenger satisfaction by providing real-time updates and accurate information. Recommendations for improving adoption include conducting awareness programs, offering targeted training, implementing pilot projects, and fostering collaborations with technology providers. By addressing these challenges, the study highlights the potential of social media to transform public transport communication and operations, leading to increased passenger trust and a more efficient transport system.

Keywords: *bus operations, marketing, public transport, social media, Sri Lanka, technology adoption*

Productivity of Army Vocational Training Before the Retirement of Other Ranks on Effective Employment in the Civil Society After Retirement

YGTM Ambakumbura[1#], NK Weerasinghe[1], and PADSW Ponnamperuma[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]ambakumbura.t@kdu.ac.lk

Vocational training provided before retirement establishes the fundamental basis for effective employment prospects and a well-functioning post-retirement life. This study assessed the relationship between productivity of the Army vocational training provided for Other Ranks (ORs) before their retirement and the effective employment prospects that they found in civilian life after retirement. This descriptive cross-sectional survey consisted of 151 ORs who retired within 5 years from 2020 and followed vocational training courses. A self-administered questionnaire obtained the data. The results revealed a significant and positive impact on of vocational training on productivity . The findings align with existing literature that emphasizes the role of vocational training programmes in equipping individuals with the skills and qualifications needed for civilian employment. Moreover, investments in vocational training are significantly beneficial.. The study also indicated that social support partially mediates the relationship between productivity in vocational training and physical and mental wellbeing. The study provides valuable insights into the factors that sharpen effective employment and underscores the pivotal roles of vocational training, physical and mental wellbeing, and social support in fruitful transition to civilian employment. Thus, a collaborative approach by military organizations, government agencies, and community-based organizations should be implemented to ensure a more prosperous transition for ORs from military to civilian life.

Keywords: *vocational training, productivity, effective employment*

Challenges Faced by Farmers in Digitalising the Organic Vgetables and Fruit Supply Chain in Sri Lanka

GSH Costa[1#], PB Kalutarage[1], UVB Rajapaksha Silva[1], and Kalpana Ambepitiya[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]swethacosta46@gmail.com

Digitalisation, which emerged with the introduction of electronic technologies and computers in the mid-20th century, has profoundly impacted industries globally. However, Sri Lanka's agricultural sector remains notably underdeveloped in this regard. This study analysed the challenges faced by organic farmers in the digitalisation of the supply chain for fruits and vegetables and explords the potential role of artificial intelligence (AI) in overcoming these obstacles. Snowball sampling was used to conduct in-depth interviews with organic farmers. Braun and Clarke's Thematic analysis for data evaluation theories were consulted. The study identifies a critical barrier: the limited technological knowledge among farmers, which undermines the effectiveness of digital tools. This paper outlines the key challenges faced by organic farmers and proposes a strategic framework for incorporating AI to boost efficiency and sustainability within the organic supply chain. The recommendations aim to bridge existing knowledge gaps and facilitate the integration of digital technologies, with the potential to significantly enhance both the efficiency and sustainability of Sri Lanka's organic vegetable and fruit sectors.

Keywords: *digitalisation, organic farming sector, challenges*

Impact of Long-Term Sports Participation in Athletic Running Events; Performance at Sports Schools in Sri Lanka

RDAM Somarathna[1#]

[1]Department of Sport Sciences and Physical Education, Faculty of Applied Sciences, Sabaragamuwa University, Sri Lanka

[#]madu@appsc.sab.ac.lk

This study aimed to understand the impact of long-term sports participation on athletic running event performance and academic subject stream choices among athletes in sports schools in Sri Lanka. A descriptive survey design was applied, involving 50 advanced-level athletes selected through total population sampling from each province based on their performance in recent years. The factors considered for long-term participation included education, sports, social background, family, injuries, and nutrition. Data were collected via a questionnaire and analyzed using SPSS software with ANOVA to determine the significance of the model. The results showed that education background ($p<0.05$), sports background ($p<0.05$), and social background ($p<0.05$) were statistically significant. The majority of the athletes (70%) opted for the Art stream, with 16% in Commerce and 14% in Technology. Performance levels indicated that 68% were national-level athletes, 26% provincial, 4% district, and 2% zonal. These findings suggest the need for improved facilities and support for athletes to balance sports and academic pursuits. This study provides valuable insights into the factors influencing long-term participation in sports among advanced-level athletes in Sri Lanka. The results emphasize the importance of supporting athletes' educational and social needs to enhance their performance and sustain their involvement in sports. Improved facilities and targeted support can help balance the demands of sports and academics, contributing to the overall development of athletes.

Keywords: *advanced level athletes, long-term participation, performance, sports school*

Exploring the Migration Intentions and Motivations among Sri Lankan Youth: A Sentiment Analysis Perspective

DMG Amasha[1#], WLKD Perera[1], PLTA Gunarathne[1], and SD Udugamasooriya[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]39-adc-0024@kdu.ac.lk

Youth migration and brain drain are major issues in Sri Lanka, with young, educated people increasingly pursuing opportunities elsewhere. This study uses sentiment analysis to investigate the motivations of Sri Lankans aged 18–27 who are considering migration. The study uses a sample of 200 adults to identify socioeconomic factors impacting migration aspirations. Data were obtained through questionnaires that included demographics, educational background, preferred migration locations, and migration motivations. An AI model in Power Automate was used to conduct the sentiment analysis of the study. A Power Automate AI model was used to conduct the sentiment analysis for the study. Power BI and Python expedited the exploratory data analysis process, providing insights on various attributes such as age, gender, province, and preferred migration countries to investigate the migratory intentions of Sri Lankan youth. Advanced studies, such as 2D and 3D cluster charts and keyword analysis, helped to identify significant patterns and insights. A sentiment study revealed a mix of economic and non-economic drivers of migration, including discontent with socioeconomic conditions and growth expectations. These findings give vital insights for policymakers to design methods for retaining talent and encouraging long-term socioeconomic development in Sri Lanka, thereby addressing the root causes of brain drain.

Keywords: *K-means clustering, migration, power automate, sentiment analysis, Sri Lankan youth*

A Medical Anthropology Study on the Challenges Faced by Traditional Medical Practitioners in the Jaffna Tamil Community

G Sarththiga[1#]

[1]Postgraduate Institute of Humanities and Social Sciences, University of Peradeniya, Sri Lanka

[#]sarthisarthi1995@gamil.com

Traditional medical practitioners (TMPs) operate at the primary level of healthcare in Sri Lanka and hold a crucial role in providing healthcare services to the community. This study aimed to assess the challenges of traditional medical practitioners in the Jaffna Tamil community. A qualitative study was carried out among purposefully selected TMPs in the Jaffna Tamil community. The primary data were gathered through 15 case studies and one key informant interview and secondary data were also used in this study. The researcher strictly adhered to ethical guidelines throughout the research. The results highlight the categories of TMPs: spiritual healing practitioners, black magicians, herbalists, home medicine, bone settlers, insect bite healers and physiotherapists. Additionally, this study reveals the challenges faced by TMPs. These challenges include insufficient financial resources to sustain their practice, limited expertise in treating illnesses, patient-related issues, and a lack of proper training. Furthermore, they face additional challenges from Western medical systems, such as the exclusion of traditional medicine in hospitals and a lack of opportunities for collaboration with Western medicine practitioners. Moreover, Western practitioners may hold negative attitudes towards Traditional medicine systems. In addition, there are several challenges in their practices in integrating with the Western system due to lack of knowledge and opportunities. Therefore, this study recommends that the Sri Lankan government recognizes the role of TMPs as important resources in primary healthcare services.

Keywords: *challenges, healing practices, health, traditional medicine, Traditional Medical Practitioners (TMPs)*

Machine Learning-Based Assessment of Post-Monsoon Groundwater Quality for Sustainable Agricultural Practices

UR Weerasinghe[1#], MC Wijayasinghe[1], BRS Mendis[1], and CS Mallawaarachchi[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]39-adc-22-0002@kdu.ac.lk

This research paper explores the applicability of machine learning algorithms and data visualization techniques in assessing groundwater quality for sustainable agriculture in Telangana, India, during the post-monsoon period. Groundwater is an integral part of agriculture. Still, its quality degrades due to a variety of factors. The chemical composition of groundwater is essential for the healthiness of the soil and crop growth. In this study, we employ K-Nearest Neighbors, logistic regression, random forests, and support vector machines to categorize groundwater quality according to its chemical properties. Additionally, data visualization methods were used to comprehend the temporal and spatial changes in groundwater quality. The data set used in this study, which includes measurements of different ions, pH, E.C., and TDS from multiple Telangana districts between 2018 and 2021, was obtained from Telangana Open Data. The data was from post-monsoon season, a time of great groundwater recharge and a broad range of groundwater quality. The findings help farmers and other stakeholders to choose the right crops, irrigation systems, and livestock to raise to improve sustainable agriculture practices in the face of declining groundwater levels and quality.

Keywords: *groundwater quality assessment, machine learning algorithms, data visualization, sustainable agriculture*

Modelling Night Occupancy of Domestic Tourists in the Colombo District of Sri Lanka

KMUB Konarasinghe[1#]

[1]Postgraduate Institute of Humanities and Social Sciences, University of Peradeniya, Sri Lanka

[#]udayakonarasinghe@gmail.com

Domestic tourism is an important segment that ensures the sustainable development of the tourism industry in Sri Lanka. Colombo district marked the second-highest domestic occupancy in the country. This study focused on forecasting night occupancy of domestic tourists in the Colombo district of Sri Lanka. Monthly data of night occupancy of domestic tourists from January 2008 to December 2020 were obtained from the Sri Lanka Tourism Development Authority (SLTDA). Sama Circular Model (SCM), Seasonal Auto-Regressive Integrated Moving Average (SARIMA) and Winter's three-parameter models were tested. The ACF and the Anderson-Darling normality test were used for model validation. The results revealed that the SCM satisfies the model validation criterion, whereas SARIMA and Winter's do not. It is concluded that the SCM is the best-fitting model for forecasting night occupancy of domestic tourists in the Colombo district of Sri Lanka. It is strongly recommended to forecast the night occupancy of domestic tourists in other districts as well.

Keywords: *Sama Circular Model, domestic tourist, night occupancy*

An Assessment of Women's Representation in Planning and Decision-Making at the Executive level

RBPM Rathnayake[1#]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]prabodharathnayake71@gmail.com

Gender diversity in planning and decision-making participation is essential for the economic, political, and social perspective of any society. Modern women are committing and working hard to gain respect and the economic status through certain feminine traits. This study focuses on examining the root causes behind the lack of women's participation in planning and decision-making positions at the executive level in Sri Lanka and proposes policy recommendations to overcome identified barriers. Qualitative methods were used such as reviewing literature. As the key factors, literature identified the influence of higher education, the role of legal structure, and the influence of culture on the absence of women's dynamic participation in planning and decision-making positions. Generally, Sri Lankan females do not tend to enroll in academic streams where plenty of job opportunities are available. Further, the legal structure of the government and particular organizations does not have sufficient influence on women's decision-making positions, and lastly, the culture inversely affects women's participation in decision-making positions as the grass-root factor. As the policy measures, the government should facilitate policies towards enhancing women's active participation through effective higher education policies and relevant policies to prevent the burden from cultural boundaries. Women themselves should ensure their self-confidence and bend their qualifications to cope with job market requirements.

Keywords: *decision-making, executive level, planning, policy, women*

AI and Man: A Philosophical Analysis on Two Noninterchangeable Ontologies

JDA Kumara[1#]

[1]Department of Social Science, Faculty of Management, Social Sciences and Humanities, General Sir John Kotelawala Defence University, Sri Lanka

[#]darshanak@kdu.ac.lk

Artificial intelligence (AI) can be defined, in simple terms, as processes performed by machines that aim to simulate human intelligence, for example, natural language processing (NLP), speech recognition, machine vision, and deep learning. If AI, simulating the human brain, can think like human beings and imitate the thinking process, the key philosophical question to be addressed is what is meant by "thinking"? Consciousness or understanding, intentionality, and self-awareness are some concerns that arise here and they will have to be dealt with in existential and phenomenological philosophy, at the outset. AI continues to advance and makes many advanced pieces of technology akin to human thinking. Human consciousness is far different from AI, not having a plan, in its very nature can be understood as an activity that is very intentional and phenomenologically reduced. Hermeneutics was used as the methodology of this study. Interpretation of existing literature to come up with a new theory and understanding of the ontologies of humans and machines was done. Ages-old philosophical ideas about "thinking" were tested with the logic behind AI systems, questioning fundamental aspects of existence. Uncovering the underlying structures of the ontology of humans and machines was investigated as an interpretative endeavor. The autonomy of AI systems is questionable with the non-origin-heterogeneous ontology of it and it acts as automata with a plan. The human experience is "out of joint" in the Derridean sense. Such anachronism would be possible with human beings, not with machines.

Keywords: *artificial intelligence, ontology, hermeneutics, consciousness, thinking*

A Content Analysis of Elon Musk's Interview about Neuralink and Its Role in Merging Humans with AI

SAKM Subhasingha[1#]

[1]Department of English Language Teaching, University of Kelaniya, Sri Lanka

[#]madushanikalpani079@gmail.com

This study examines Elon Musk's vision for human-AI symbiosis through Neuralink. Neuralink is a brain chip that would be implanted in the human brain, it is specially known as a Brain -Machine Interface (BMI). The research gap identified is that even though previous research has explored the technical aspects of Neuralink, there is a significant gap in understanding the socio-cultural and philosophical implications of Neuralink. Therefore, this research aims to understand how Musk's vision aligns with current scientific understanding and societal values. To collect data, an interview with Elon Musk was selected through the purposive sampling method. The study employed a qualitative content analysis method to identify key arguments for the key themes built up through the research framework, "Rise of Machine Agency: A Framework for Studying the Psychology of Human-AI Interaction (HAII)" by Sundar (2020). In the results and findings, statements by Elon Musk were analyzed under three key themes: Neuralink and the future human-AI relationship, power dynamics and social inequalities, and long-term implications for societal, psychological, and existential aspects. The findings suggest that while Neuralink offers promising applications in human-AI relationships, it also raises significant concerns about power dynamics and long-term societal, psychological, and existential aspects. In conclusion, the study reveals a complex interplay of technological promise and societal concerns. While Neuralink offers potential benefits, such as enhanced cognitive abilities, it also raises significant ethical questions about human identity in the future. Future research should develop ethical frameworks to ensure the equitable use of Neuralink.

Keywords: *human-AI interface, Neuralink, socio-cultural and philosophical implications*

Effect of Social Media Usage on Behavioural Changes in Adolescents admitted to and attended the clinics of the District General Hospital Hambantota

RI Priyanjali[1#], HAR Ahinsa[1], SGC Madushani[1], KN Pushpakanthi[1], HRD Lakshani[1], HMCRK Thilakarathna[1], and KTG Kanchana[1]

[1]Faculty of Nursing KIU, Sri Lanka

[#]ridmathilakarathna95@gmail.com

Social media, an internet-based form of communication, has become an integral part of adolescents' lives, strongly influencing their behavior. Excessive usage exposes adolescents to risks such as internet addiction, cyberbullying, body image concerns, and reduced engagement in healthy activities. This study aimed to evaluate the effect of social media usage on the behavioral changes among adolescents who were admitted to or attended the clinics of the District General Hospital (DGH) DGH Hambanthota. A descriptive quantitative study was conducted among 181 parents of adolescents (age10-17) who attended to the wards and pediatric clinic at DGH Hambanthota. A self-administered questionnaire including perceived social media usage and behavioral changes, developed by the investigators were used to collect data. Data analysis was performed using SPSS v25. Among 181 participants, the majority were early adolescents (68.5%, n=124), females (55.2%, n=100), monthly income >Rs.45,000/= (59.1%, n=107), and had only one sibling (48.1%, n=87). Further, 87.8% of parents/guardians perceived that their child exhibited behavioral changes due to social media usage. Overall, "Drifting away behavior" had the highest mean (26.55±2.27), indicating it as the most prevalent and varied behavioral change observed. "Wasting time behavior" and "Addiction behavior" showed moderate mean values (14.20±1.92 and 10.88± 1.56 respectively) while "Ownership behavior" (Mean 8.5±1.20) was the least prevalent behavioral change observed. Chi square test showed that these behavioral changes were significantly associated with adolescents age (p = 0.017). In conclusion, the study underscores the significant impact of social media usage on the behavioral changes of adolescents, highlighting concerns that are increasingly relevant in today's digital age. The association between these behavioral changes and the age of adolescents points to a crucial period during early adolescence when intervention could be most effective. Further research is needed to develop effective intervention strategies.

Keywords: *social media usage, adolescents, behavioral changes*

Mental Health Awareness and Coping Mechanisms Among Engineering Undergraduates at General Sir John Kotelawala Defence University

KVND Vithanage[1#], ADU Dewmini[1], and HMDK Thilakarathna[1]

[1]Faculty of Engineering, General Sir John Kotelawala Defence University, Sri Lanka

[#]40-eng-0004@kdu.ac.lk

Abstract– This study aims to assess the level of mental health awareness among engineering undergraduates at General Sir John Kotelawala Defence University (KDU) and identify specific stressors and coping mechanisms. A Google survey with 65 participants in the study revealed varying levels of mental health awareness among students. Key findings include the identification of prevalent stressors such as academic pressure, workload, and social isolation. The study also highlights notable gaps in awareness of available resources and effective coping strategies. Participants reported using a range of coping mechanisms, including spending time in nature, engaging in enjoyable activities, connecting with others, and seeking self-help resources. However, some students preferred isolation over professional help due to the stigma surrounding mental health. This study provides new insights into the unique mental health challenges faced by engineering students at KDU and proposes tailored interventions specific to this population. Recommendations include implementing educational programmes to enhance mental health literacy, fostering a supportive campus environment, and expanding counselling services to meet the specific needs of engineering undergraduates. These measures aim to prioritize mental wellbeing and support academic success at KDU.

Keywords: *mental health awareness, Engineering undergraduates, stressors, coping mechanisms, tailored interventions*

The Impact of Teaching Speaking as a Skill for Grade 3 English as a Second Language (ESL) Learners in Sri Lanka

Mahrifa Faiz[1#], GDK Dhananjaya[1], IN Palihakkara[1], and HMN Bandara[1]

[1]Department of English Language Teaching, University of Kelaniya, Sri Lanka

[#]mahrifafaiz636@gmail.com

English, as a global lingua franca, is crucial for communication, education, and professional growth. In Sri Lanka, English is taught as a second language (ESL) from early primary education, emphasizing its importance for students' academic and future career prospects. This study investigates the impact and effectiveness of teaching speaking skills to Grade 3 ESL learners in Sri Lanka, focusing on how instructional strategies influence speaking proficiency and overall language development. Speaking is a fundamental skill that enhances cognitive abilities, social interactions, and self-confidence among young learners. The research aims to identify the impact of teaching speaking on students' speaking strategies and evaluate the overall effectiveness of these instructional practices. The study involved 10 Grade 3 ESL students from St. Francis College, Dalugama, using a mixed-method approach that included pre-tests, instructional sessions based on the "talk as transaction" theory, and post-tests. Findings indicate significant improvements in speaking proficiency, including reduced use of fillers, fewer requests for clarification, decreased reliance on mimes, and increased use of paraphrasing. These results suggest that targeted interventions and structured teaching methodologies, such as role-playing and interactive activities, can enhance speaking abilities, leading to greater confidence and fluency. The study underscores the need for continuous assessment and adaptation of teaching methods to meet diverse learner needs. However, it also highlights limitations due to the small sample size and suggests future research should involve larger, more diverse groups to provide a comprehensive understanding of effective ESL speaking instruction.

Keywords: *confidence, English as a second language, sri lanka, teaching speaking as a skill*

The Effectiveness of Small Group Discussions in Teaching Speaking as a Skill for Grade 6 English as a Second Language Learners in Sri Lanka

M Faiz[1#] and HMN Bandara[1]

[1]Department of English Language Teaching, University of Kelaniya, Sri Lanka

[#]mahrifafaiz636@gmail.com

Teaching speaking skills to English as a Second Language (ESL) learners poses a significant challenge, especially in contexts where English is not the primary mode of communication. Among various pedagogical approaches, small group discussions have gained attention for their potential to enhance speaking proficiency. The present study aims to examine the effectiveness of small group discussions in improving the speaking proficiency of Grade 6 ESL learners in Sri Lanka while identifying the impact of small group discussions on student engagement and confidence in using ESL. The study employed a mixed method approach and an experimental research design. Accordingly, sixteen Grade 6 ESL learners with first language Tamil from Al-Mubarak National School were selected as the research sample using a simple random sampling method. During data collection, the study used both quantitative and qualitative data collection methods. Quantitative data was collected through pre and post-tests while qualitative data was collected through observations. The quantitative data was analyzed by the researchers using MS Excel and the qualitative data was analyzed through a thematic analysis. The findings reveal that small group discussions significantly improve language skills, student engagement, vocabulary building, conceptualization of meaning, and constructs self-confidence in utilizing ESL. Thus, integrating small group discussions into the ESL curriculum can be instrumental in nurturing a supportive learning environment conducive to linguistic growth and learner empowerment.

Keywords: *English as a second language, small group discussions, teaching speaking as a skill*

Bridging the Gap: Data-Driven Techniques to Improve Tax Collection Efficiency

DTAN Jayasinghe[1#], MANS Machado[1], APK Lakshan[1], and SMMCB Samarakoon[1]

[1]Department of Language, General Sir John Kotelawala Defence University, Sri Lanka

[#]39-adc-0016@kdu.ac.lk

Governments that collect taxes inefficiently are financially weakened, which impacts economic growth. The "tax gap" that results from this, or the difference between the amount of tax that is actually collected and the amount that is theoretically owing, is quite costly. This study explores the ways in which data-driven research might be used to close this disparity and enhance the efficiency of tax collection. To do this, we suggest utilizing the potential of sophisticated analytics, especially network machine learning. By analyzing intricate links within taxpayer data, network machine learning enables us to find hidden patterns and abnormalities. The "true" tax burden for people and corporations will be estimated taking into account a variety of economic factors using methods such as linear regression analysis. Furthermore, clustering techniques will be used to find taxpayer groups that share traits and are more likely to violate regulations. By using taxpayer data, the project seeks to formulate a multifaceted strategy. First, using the data analysis to identify high-risk locations, focused audits will be created. This method concentrates resources on people who are most likely to be non-compliant, which maximizes the effectiveness of audits. Second, the project will use these data to develop focused campaigns that encourage taxpayers to comply voluntarily. This could entail tax filing process simplification, educational initiatives, or incentive schemes for accurate and timely tax reporting. Through the use of advanced analytics, the project seeks to create a system that is more effective and efficient by revealing hidden trends and risk concern.

Keywords: *tax gaps, tax efficiency, taxpayer, economics, linear regression, clustering*

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Non-linguistic factors affecting the speaking skills of grade seven and grade eight English as a Second Language learners in Nittambuwa, Gampaha District, Sri Lanka

HK Thumpalage[1#] and RSHN Wimalarathna[1]

[1]Department of English Language Teaching, University of Kelaniya, Sri Lanka

[#]hansanathumpalage@gmail.com

Speaking is an aspect that needs special attention and instruction in English as a Second Language teaching, yet the least addressed aspect in the Sri Lankan ESL context. ESL learners may encounter various issues affecting the speaking skills in the process of learning the language. Linguistic and non-linguistic factors are one of the many criteria that can be considered under the factors affecting the speaking skills of ESL learners. This study aims to identify the non-linguistic factors affecting the speaking skills of grade seven and grade eight ESL learners in Nittambuwa, Gampaha district. Thus, the objective of this research is to examine the non-linguistic factors affecting the speaking skills of young ESL learners within the Sri Lankan setting. A mixed method design was used in analyzing the primary data gathered through observations and interviews. The sample population consisted of twenty-five grade seven and grade eight, ESL learners. The analyzed data give insight into the most common non-linguistic factors affecting young, Sri Lankan, ESL learners. The preliminary results identified that the most common non-linguistic factors affecting the sample population were anxiety, lack of motivation, personality traits, peer influence, and environmental factors. The results further revealed that the feedback of the teacher in the classroom plays a crucial role in aggravating these very non-linguistic factors. In conclusion, the findings of this research imply that these affective non-linguistic factors significantly impact the speaking skills of ESL learners in Sri Lanka, highlighting the need for targeted attention in both classroom practice and curriculum development.

Keywords: *: non-linguistic factors, speaking skill, ESL learners*

Predicting Water Quality Conditions in Wimmera Catchment, Australia: A Machine Learning Approach Using Environmental Parameters

MC Wijayasinghe[1#], KKDAL Kannangara[1], SMMCB Samarakoon[1], and CS Mallawaarachchi[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]39-adc-0020@kdu.ac.lk

The research aims to determine the water quality condition of Wimmera catchment in Australia based on the different environmental parameters like temperature, turbidity, electrical conductivity, dissolved oxygen, and hydrogen potentials (pH). A quantitative approach on the data set extracted from the Australian government data repository was used in the study and machine learning algorithms such as Clustering, Gradient boosting, and Random Forest algorithms were used based on the nature of the data set. Using the mentioned methodologies initial identification of the number of clusters that could be generated based on the parameters using water flow conditions was performed. The regimes of water flow were predicted based on the different environmental parameters throughout the sampling locations in the Wimmera catchment.

Keywords: *water quality conditions, environmental parameters, regimes of flow, clustering, gradient boosting, random forest algorithm*

A Comprehensive Analysis of the Surge in Lithium Battery-Related Fires with Leveraging Machine Learning

BRS Mendis1[1#], UR Weerasinghe[1], APK Lakshan[1], and SD Udugamasooriya[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]39-adc-0018@kdu.ac.lk

This research paper explores the increasing surge in lithium battery-related fires, particularly those involving electric vehicles (EVs) and lithium-ion batteries, presents a pressing safety concern that demands urgent attention. While EVs are lauded for their potential to significantly reduce carbon emissions and support sustainable transportation, the growing occurrence of battery fires underscores significant risks to public safety. This research provides a comprehensive analysis of the surge in lithium battery-related fires, with a specific focus on EVs and lithium-ion batteries. Through the utilization of classification, clustering, and data visualization methodologies, the study aims to identify underlying techniques, and seeks to uncover underlying patterns and emerging trends linked to incidents. Furthermore, the research investigates the effectiveness of existing safety measures and protocols in mitigating fire risks, while also proposing evidence-based recommendations for enhancing fire prevention, emergency response, and public awareness initiatives.

Keywords: *Lithium battery-related fires, Electric Vehicles (EVs), Lithium-ion batteries, sustainable transportation, risk assessment, clustering, classification*

Enhancing L2 Writing Accuracy through Cooperative Learning: An Action Research Approach

HBH Pravini[1#]

[1]Department of English Language Teaching, University of Kelaniya, Sri Lanka

[#]hirushikapraveeni1997@gmail.com

In Sri Lanka's exam-focused education system, the General Certificate of Education (Ordinary Level) and Advanced Level exams predominantly assess reading and writing skills. Despite this emphasis, many students demonstrate inadequate proficiency in second language (L2) writing, attributed to mismatches between curriculum demands and students' actual language skills. Therefore, this action research, involving 54 male students in a Ship Cook course, explores the potential of cooperative learning to improve L2 writing accuracy. Grounded in holistic ethnographic method and sociocultural theory, the study included a pilot intervention with pre- and post-tests comparing the impact of cooperative versus individual writing tasks. Qualitative data collection involved classroom observations, recording of students' metatalk and collection of students' reflective writings on their cooperative writing experience. Quantitative results revealed significant improvements in writing accuracy through cooperative tasks, while qualitative data highlighted the value of collaborative interactions in language development and scaffolding. The findings suggest that structured cooperative tasks, incorporating L1 use and collaborative problem-solving, effectively support L2 writing in heterogeneous classroom settings. This study advocates for integrating cooperative learning into English as a Second Language (ESL) teaching to foster cognitive, metacognitive, and social-affective strategies in students.

Keywords: *cooperative learning, language accuracy, writing, metatalk, learner interaction*

Analyzing the Socio-Economic Determinants of Sri Lankan Migration Patterns: A Data Mining Approach

BSM Dayaratne[1#], KEU Kankanamge[1], DHHK Peiris[1], and BHCA Kaveeshwara[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]39-adc-0040@kdu.ac.lk

This study investigates the socio-economic determinants of migration in Sri Lanka using specific data mining techniques. Key variables analyzed include remittances, educational levels, occupational sectors, and regional demographics. The research uncovers patterns that inform migration decisions, offering insights for policymakers to develop targeted interventions. The findings aim to promote policies that foster inclusive growth and improve the well-being of Sri Lanka's population.

Keywords: *migration, socioeconomic factors, remittances, demographics, policy*

The Use of Code-Switching as a Teaching Tool at the Tertiary Level: A Case Study of English Lecturers in the Department of English Language Teaching at the University of Kelaniya

PGRY Gamage[1#]

[1]University of Kelaniya, Sri Lanka

[#]ransikayasasini@gmail.com

The present study examines the use of Code-Switching (CS) as a teaching tool by English lecturers in the Department of English Language Teaching (DELT) at the University of Kelaniya. The research focuses on compulsory 2-credit intensive courses including English for Humanities (DELT 12252) and English for Social Sciences (DELT 11212), which are offered to undergraduates from the Faculty of Humanities and the Faculty of Social Sciences. The key objective of this study is to determine the frequency and rationale behind the use of CS by DELT lecturers during English as a Second Language (ESL) lectures. Qualitative data for the study were gathered from 12 temporary assistant lecturers and demonstrators of the DELT via semi-structured interviews. Data were analyzed thematically using Canagarajah's (1995) theoretical framework on the functions of CS. The findings denote that CS is strategically used by DELT lecturers to enhance instructional effectiveness, particularly in contexts that require improved student comprehension and active engagement. This study further identifies the most and the least common reasons for the use of CS by lecturers, demonstrating its role in facilitating better comprehension and engagement among undergraduates. This research contributes to the broader understanding of the pedagogical benefits of CS in bilingual educational settings, emphasizing its significance in improving English language instruction at the tertiary-level education system in Sri Lanka. Further, this study evinces that CS facilitates better comprehension and engagement among undergraduates. Overall, the findings conclude that while CS is an effective teaching tool during ESL lectures, its application remains context-dependent.

Keywords: *code-switching, teaching tool, english language teaching*

L2 learners' difficulties in listening comprehension; Learners' perspectives among university undergraduate students

WKDO Walpita[1#]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]40-bte-0014@kdu.ac.lk

Listening skill plays a crucial role in English language learning and it demands mandatory attention in language classrooms as listening comprehension plays an important role in communicating effectively in English. Learners who study English as a second language (L2 learners) in Sri Lanka always find that comprehending English by listening is difficult. Hence this study focuses on finding out the difficulties that L2 learners face in listening comprehension based on the learners' perspectives and what students suggest to overcome those difficulties. Forty-four second year undergraduate students who are reading for their BSc in Applied Data Science Communication and those who are attending lectures conducted in English medium were given a survey to discover the difficulties they face and some of them were interviewed for further clarifications. The major difficulties emphasized by learners were the speaker's accent, speaker's pace, lack of concentration, unfamiliar vocabulary, lengthy and complex input, monotonous concepts, unclear statement made by speaker, inadequacy in asking lectures to repeat in the classroom, shortage of previous knowledge on certain topics, and noisy environment in the classroom. The participants suggested practicing active listening, seeking clarification when needed, and engaging with a variety of English accents through multimedia resources to overcome listening comprehension difficulties. The findings imply that teachers should incorporate a variety of English accents in their teaching materials, listening exercises, and explicit vocabulary instruction also should be integrated into listening exercises focusing on both familiar and challenging words.

Keywords: *listening comprehension, difficulties , L2 learners*

The Impact of ChatGPT on Vocabulary Development in Written Proficiency Among Sri Lankan Tertiary-Level ESL Learners

NP Wickramage[1#], DGK Amunugama[2], EMAN Ekanayake[2], NN Welgama[2], and DU Wickramasinghe[2]

[1]Department of English, Cinec Maritime Campus (Pvt) Ltd, Sri Lanka
[2]Department of English Language Teaching, University of Peradeniya, Sri Lanka

[#]nilupamawic4@gmail.com

In an era where technology is rapidly transforming education, the potential of Artificial Intelligence (AI) to revolutionize English language learning is becoming increasingly evident. Thus, the primary aim of this study is to explore the impact of ChatGPT, a machine-learning system, on vocabulary development in written proficiency among Sri Lankan tertiary-level ESL learners. Conducted with 50 first-year undergraduates pursuing degrees in Commerce and Management Studies from the University of Kelaniya and the Australian College of Business and Technology, the research employed pre-test and post-test assessments to evaluate students' progress. Participants underwent a 20-hour intervention using ChatGPT during their English Language lectures, with significant findings highlighting enhanced vocabulary development and improved written proficiency. The research employed a mixed-method approach, utilizing pre-test and post-test assessments analyzed with the CEFR marking rubric and content analysis to explore themes and understand changes in vocabulary. Moreover, descriptive statistics was used to explore the changes in the pre-test and post-test scores. The study also emphasized a balanced approach, combining AI assistance with traditional teaching methods to ensure independent skill development. Ethical considerations and academic integrity were addressed, educating students about responsible AI use to mitigate potential issues of plagiarism. The results underscore the potential of integrating AI tools like ChatGPT into ESL curricula, offering valuable insights for educators and policymakers aiming to optimize language education. Henceforth, this research contributes to the growing body of knowledge on AI's role in language learning, particularly in contexts where English is learned as a second language, such as Sri Lanka.

Keywords: *ChatGPT, English as a Second Language, vocabulary development*

Predictive Modeling of Obesity Trends Using Machine Learning Techniques

P Laksia[1#]

[1]Faculty of Management, Social Sciences and Humanities, General Sir John Kotelawala Defence University, Sri Lanka

[#]40-adc-0013@kdu.ac.lk

Obesity prevalence is on the rise, presenting a host of health problems for major portions of the world; effective predictive modeling has been brought to the fore to assist in public health intervention. This study analyzes and predicts the level of obesity on the ground based on various variables, applying a wide-ranging dataset from the UCI Machine Learning Repository. K-Nearest Neighbors, Random Forest, Decision Tree, Support Vector Machine, clustering, and regression analyses are some of the machine learning techniques applied in this research. This returned an accuracy of 94.32%, a precision of 95%, a recall of 94%, and an F1 score of 94%. The findings on the best-predicting models of obesity are of major importance in informing improved public health strategies and interventions. This study, therefore, identifies the role of machine learning in the identification of trends in obesity and calls for improved versions of these predictive models.

Keywords: *obesity, machine learning, K-Nearest Neighbors, Random Forest, decision tree, support vector machine, classification, clustering, regression*

Exploring Morphological Variations in Sinhala Songs with Embedded English Lyrics

MHS Samarasinghe[1#] and WRIU Nilaweera[2]

[1]Department of English Language Teaching, University of Colombo, Sri Lanka
[2]University of Kelaniya, Sri Lanka

[#]heshani@delt.cmb.ac.lk

This study explores the bilingual language adaptations in Sri Lankan song lyrics, focusing on their morphological processes and creative strategies. In the sociolinguistic landscape of Sri Lanka, where Sinhala and English coexist, bilingual song lyrics provide a rich ground for examining the interplay between language and culture. The current study utilised a qualitative approach. Thirty bilingual song lyrics were analyzed using thematic analysis under morphological processes such as nominalization, code-switching, nativization, and reduplication. These processes highlight the linguistic creativity of lyricists and reflect broader cultural dynamics. The findings illustrate that these linguistic adaptations are not merely artistic choices but also significant cultural expressions, negotiating and articulating bilingual and bicultural identities. Ultimately, this study underscores the evolving nature of language in a multilingual society and its impact on the cultural significance of music, demonstrating the close relationship between the composer's intentions and the audience's reception.

Keywords: *bilingualism, nominalization, code-switching, nativization, and reduplication*

The relationship between language and other modalities such as eye contact, body gestures facial expressions and context in communication in a bilingual classroom

KJAVO Jayakody[1#]

[1]General Sir John Kotelawala Defence University

[#]38-bte-0013@kdu.ac.lk

This study investigates the relationship between language and non-verbal modalities in a bilingual classroom at a Sri Lankan university. The central research question examines the existence and nature of the relationship between language and other modalities, including eye contact, body gestures, facial expressions, and contextual factors in communication. Employing qualitative research methodology, the study focuses on group discussions among a group of undergraduates at a Sri Lankan university, capturing the dynamic nature of bilingual interactions. The thematic analysis serves as an analytical lens, providing insight into the multiple dimensions of language and non-verbal dynamics in different communicative contexts based on two different discussions, one on an academic topic and the other on a general topic, which were video-recorded and meticulously observed using a predefined observation checklist. The findings show that the non-verbal cues are aligned with their communication, which are subtle communication patterns that reveal the simultaneous influence of non-verbal cues and contextual factors in their communication. In academic discourse, participants grapple with linguistic complexities and discussions on the general topic revealed the delicate balance between the academic discussion and the general discussion, emphasizing the powerful influence of language contexts on personal interactions. This study contributes to the developing body of literature on bilingual communication elements of language and non-verbal modes in the context of a Sri Lankan university. The implications of the study are for improving communication strategies in bilingual educational settings to ELT instructors, policymakers, and curriculum developers to look into how to make language communication more effective with the psycholinguistic aspects.

Keywords: *non-verbal modalities, language, bilingual communication, context in communication*

Corpus-based Study of Linking Words used in Academic Journal Articles in the ELT Journal and TESOL Quarterly

GK Nayanathara[1#]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]38-bte-0001@kdu.ac.lk

In the context of ELT, the current study attempts to investigate which linking words are most and least frequently used in the ELT Journal and TESOL quarterly. Research articles published in journals are referred to as scholarly articles, or academic journal articles. For the purpose of this study a corpus was built with total of 50 research articles published in TESOL Quarterly and the ELT Journal. An analysis and identification of the usage of linking words in these journal articles was conducted by loading the corpus into the LancsBox corpus tool with a total of 404887 tokens. The study examined 30 linking words in total and sought to answer two research questions regarding the most and least common linking word types as well as the linking words' usage. Results showed that "and" was the most frequent, while "thirdly" was the least. Additionally, "for," "or," "but," and "as" appeared frequently, whereas "until," "unless," and "firstly" were less common. Coordinate conjunctions emerged as the most prevalent type of linking words. Among six categories, information-adding linking words were the most commonly used. These findings provide valuable insights for educators on the use of linking words in academic writing and suggest further research on their application across various contexts.

Keywords: *corpus-based analysis, linking words, frequency, journal articles, ELT, TESOL*

Perceptions of using AI powered language applications for self-studying English

MA Zumla[1#], KWCKDM Karunarathna[1], BALT Basnayake[1], and DMSD Dissanayake[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]40-bte-0001@kdu.ac.lk

Artificial intelligence (AI) and AI powered language applications play crucial roles in self-learning a language. This research focuses on the experiences and the perceptions on using AI powered language applications for self-learning English among TESOL (Teaching English to the Speakers of Other Languages) practitioners of General Sir John Kotelawala Defence University, Sri Lanka. The rapid progress of AI made the language learning applications based on the adaptability, flexibility, accessibility and versatility of the individuals which suits each learner's pace, style and preferences. This study has used a mixed method approach including questionnaires (quantitative) and focus group discussion (qualitative). According to the convenient sampling, about 91 TESOL practitioners of General Sir John Kotelawala Defence University, Sri Lanka were considered as the sample of the study. The key findings of the study reveal that 85% of TESOL practitioners found AI-powered language applications significantly enhanced their English learning and based on the demographic variations, younger users, non-native speakers, and those with specific language needs found AI tools particularly beneficial. This study offers useful information for educators, application developers and policy makers to improve the effectiveness of AI powered language applications and learning systems.

Keywords: *artificial intelligence, AI powered language applications, autonomous learning, perceptions of TESOL practitioners*

An Investigation into Language Assessment Literacy among ELT Professionals in Sri Lanka

DAAKL Dassanayake[1#]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]38-bte-0002@kdu.ac.lk

Assessment literacy is a major component which a language teacher should have gained, as it affects the quality of teaching and learning. This research is an investigation on language assessment literacy of English language teaching professionals in Sri Lanka. The study investigated to what extent the English language teaching professionals in Sri Lanka possess language assessment Literacy. This study has applied quantitative research methodology and a questionnaire was used to collect data from the stakeholders. The knowledge and the skills that were related to assessment literacy were assessed using the questionnaire and it included 71 language assessment literacy aspects. The 71 statements were in a Linkert scale and participants had to rate 0-4 by following the given explanations that were based on their knowledge. Fifty-three ELT professionals from different districts and provinces in Sri Lanka participated in this research. The findings of this research indicated that, ELT professionals were moderately knowledgeable about language assessment and their knowledge varied from one another as there were different ELT professionals such as language teachers, language testing/assessment developers, test score users and professional examiners and raters. This study contributes for the development of ELT professionals' knowledge and skills by providing a self-assessment to identify the areas they lack under language assessment literacy aspects and revealing their level of the knowledge on assessment literacy. The results of this study can be used in syllabus designing of pre-service English teaching courses and for in-service continuous professional development programs.

Keywords: *language assessment literacy, english language teaching professionals*

Clustering Analysis of Performance Differences Between Veteran and Rookie Basketball Players

JKDMYY Jayanetti[1#], MBF Amna[1], HTSH Samadhi[1], and KGT Randika[1]

[1]Faculty of Management, Social Sciences and Humanities, General Sir John Kotelawala Defense University, Sri Lanka

[#]40-adc-0023 @kdu.ac.lk

Professional basketball teams constantly strive to balance veteran leadership with emerging talent, aiming to optimize player performance and team success. This study aims to analyze the impact of experience on player performance by comparing veterans and rookies using their statistics over five years. The study focuses on key performance metrics, including points, player efficiency rating (PER), win shares (WS), box plus/minus (BPM), and value over replacement players (VORP). Players with less than four seasons were classified as 'Rookies,' while those with four or more seasons were classified as 'Veterans.' Using K-means clustering we identified three distinct clusters based on performance metrics. Cluster 0 had rookies with low values of performance metrics, Cluster 1 included both rookies and veterans having medium values, and Cluster 2 consisted only of veterans with high values. We also used DBSCAN algorithm to validate and support our findings. It recognized that high-performing veterans as outliers. Our findings illustrate the significance of experience in player performance as veterans consistently outperformed rookies in all metrics. The study suggests that team performance can be improved by combining rookies with experienced players. It is possible that future research would then go on to develop an even deeper understanding of performance dynamics using new algorithms or measurement techniques.

Keywords: *basketball, sports analytics , K-mean clustering, DBSCAN, clustering analysis*

The Importance of Using Artificial Intelligence in Teaching Spoken English in Sri Lanka: A Study Based on Duolingo

BGYR Uyangoda[1#], ACI Werellagama[1], and MLYN Perera[1]

[1]Department of English Language Teaching, University of Kelaniya, Sri Lanka

[#]ruvinathuyangoda@gmail.com

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think and learn similar to humans. Hence, systems which have been made employing it are capable of performing tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making, and language translation. This study determines the role of Duolingo as an Artificial intelligence platform in English language teaching and explore if it can play a major role in teaching speaking in English Language Teaching in Sri Lankan context. This study employs library research. The findings of the study reveal that Duolingo is a popular AI platform among individuals in many countries that offers more than 23 languages as options. It provides a positive impact on language learning with translation exercises, matching exercises, pairing exercises, listening exercises and speaking exercises. Speaking is one of the main skills to be improved when learning a language and findings of the study reveals that students are able to improve their speaking proficiency by using Duolingo. Moreover, Duolingo can indeed play a significant role in teaching spoken English in Sri Lanka.

Keywords: *Duolingo, ESL classroom, speaking*

Assessing the Health Impacts of Repeatedly Heated Cooking Oil Consumption Using AI Technology

MM Jayasinghe[1#], LAP Thasanya[1], P Laksia[1], and TV Induruwage[2]

[1]Faculty of Management, Social Sciences and Humanities, General Sir John Kotelawala Défense University, Sri Lanka

[2]Faculty of Engineering, General Sir John Kotelawala Défense University, Sri Lanka

[#]40-adc-0035@kdu.ac.lk

This study evaluates the health consequences of consuming repeatedly heated coconut oil, which is widely utilized in Southern Asia. Coconut oil, which is commonly used in street food markets and restaurant chains, undergoes chemical transformations when heated repeatedly, causing major health hazards. The researchers employed AI-based machine learning algorithms to examine the chemical changes and harmful byproducts that occur in oil with repeated use. Specifically, data from 1,000 oil samples of 200 different food items fried in coconut oil that were evaluated for pH levels and the hazardous chemical 24-decadienal were used. The findings revealed that the usage of repeatedly heated coconut oil increased acidity and harmful chemical levels, which have been connected to oxidative stress and inflammation, where both the factors are considered as risk factors towards our health such as chronic diseases namely, cancer, diabetes and heart diseases. The study presents actual data which demonstrates the health concerns associated with the repetitive heating of frying oil. A comprehensive analysis is provided by utilizing machine learning algorithms. The study provides the significance of establishing clear and comprehensive guidelines for using cooking oil, while raising public awareness. Prospective researches could investigate into the health impacts of other types of oil which are utilized for cooking purposes and their methods of utilization in order to broaden the views in the culinary world.

Keywords: *coconut oil, repeated heating, health risks, machine learning, Chemical composition*

Comparative Analysis of Machine Learning Models for the Precision of Dengue Severity Prediction

P Miloshan[1#], LNNA De Silva[1], MU Sathyanjalee[1], and HWJ Pamoda[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]39-adc-0006@kdu.ac.lk

The mosquito-borne disease dengue virus has been recognized as a major public health disease across many Asian countries including Sri Lanka. With the increasing occurrence of dengue, it becomes essential to have precise prediction models to guide preventative treatments and efficiently allocate resources. Leveraging age-related aspects and epidemiological data as the primary focus, this study explores the potential benefits of machine learning algorithms for determining dengue prevalence. The analysis approach involves the assessment of three models: Logistic Regression, Decision Tree, and Random Forest. The study analysed a comprehensive data set including patient information and categorization of dengue severity. This model offers essential insights into important factors that might predict the severity of dengue, enabling the implementation of effective methods of management. The study seeks to enhance dengue prevention initiatives and patient outcomes, especially in vulnerable groups in Sri Lanka, by emphasizing the significance of machine learning in developing effective public health interventions.

Keywords: *Dengue Severity prediction, machine learning, logistic regression, random forest, decision tree , Dengue fever, Sri Lanka*

Teacher Perspectives on Different Englishes Used in Sri Lankan Classrooms

RATP Rajapaksha[1#]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]38-bte-0018@kdu.ac.lk

English language has several varieties such as Sri Lankan English, British English, and American English and teachers have different perspectives on these different English varieties. In the Sri Lankan education system, there are three main sectors namely primary, secondary, and tertiary levels. Perspectives of teachers in these three different sectors toward different English varieties can vary depending on their linguistic backgrounds and the context in which they teach. Such perspectives have a significant impact on their teaching practices and students' learning experiences. Because of this, it is important to get to know about teachers' perspectives on different English varieties. The study investigated primary, secondary, and tertiary level teachers' perspectives toward different English varieties used in classrooms. In order to gather data for the study, a mixed method approach was used. Structured interviews were conducted to gather qualitative data while a questionnaire was used to gather quantitative data. The study findings show that the majority of teachers had positive attitudes towards and preferred to use Sri Lankan English. Additionally, teachers accepted different varieties to be used within the classroom enriching students' linguistic knowledge. Furthermore, the study presents recommendations for teachers and curriculum developers on how to effectively use different English varieties in the teaching process and curriculum and material development.

Keywords: *World Englishes, perspectives, Sri Lankan English, standard English*

ID 606

Factors Influencing the Effectiveness of English Medium Education in Government Schools (Grade 01 - 05) in Colombo District

JVMS Jayathilake[1#] and T Wijetunge[1]

[1]Department of Management and Finance, Faculty of Management, Social Sciences and Humanities, General Sir John Kotelawala Defence University, Sri Lanka

[#]veenavijayathilake@gmail.com

The study addresses the implementation of English medium instruction at government primary schools within the Colombo district from grades 1 – 5. The importance of this research lies in understanding how socio-economic background, teaching methods, learning resources, teacher qualifications, parental involvement, and school infrastructure impact students' English language proficiency. A mixed-method approach was employed, combining quantitative data from online surveys of teachers, parents, and administrators with qualitative insights to provide a comprehensive analysis. According to the results success of English medium instruction has a very high and positive correlation with the availability of resources for learning, qualification of the teachers, and school infrastructure. Other influential factors are socio-economic status, quality in methodology, approaches to teaching and learning, and the home influence. The researchers conclude that direct efforts via strategic steps should be taken to ensure improvement in the allocation of resources, teacher training, and infrastructure. Recommendations would be to increase the budget allocation for teaching resources, constant teacher training, and programmes to engage parents further in their children's education. The study advocates for future research to explore the long-term effects of English medium education through longitudinal studies. Incorporating qualitative data is also suggested to complement the quantitative findings, providing a more comprehensive understanding of the factors at play. The study emphasizes the need for targeted interventions to address the critical areas of resources, teacher qualifications, and infrastructure to enhance the effectiveness of English medium education in primary schools within the Colombo district.

Keywords: *English medium instruction, socioeconomic background, learning resources, teacher qualifications, parental involvement, school infrastructure*

The Effect of Using Audio Visual Materials with Subtitles on Second Language Vocabulary Learning

KGSRK Jayawardane [1#]

[1]University of Sri Jayewardenepura, Sri Lanka

[#]sameera@sjp.ac.lk

The main purpose of this study was to examine the impact of watching video materials with subtitled on second language vocabulary learning. 117 adult learners of English who were in the pre-intermediate level were selected for this study and they were randomly divided into four experimental groups (A, B, C and D) and one control group (E). Experimental group A watched the videos with subtitles only once, B without subtitles only once, C with subtitles twice and D without subtitle twice. All groups watched the same three videos during the experimental session. All of them took a pre and a post-test which tested their receptive and productive knowledge of 15 target words occurred in the videos. The control group took only the pre and post-tests. Data analysis indicated that those who were in Groups A, B, C and D were able to increase their receptive knowledge of vocabulary after watching the videos with or without subtitles. Those who watched videos without subtitles only once (B) did not demonstrate any significant gains in the productive vocabulary knowledge although groups A, C and D were able to. Control group (E) did not show any difference between pre and post-tests. The findings indicate that video watching in general can increase L2 learners' receptive vocabulary knowledge even if those do not contain subtitles. If learners watch videos several times without subtitles, they may also be able to increase their productive vocabulary knowledge too. Therefore, teachers should encourage L2 learners to watch videos to enhance their vocabulary growth.

Keywords: *vocabulary, acquisition, subtitles, videos, authentic materials*

Do Data Science Degrees in Sri Lanka Fullfil the Needs of the Job Market?

BCT Wickramasinghe[1#], WWDP Fernando[1], WHS Amaya[1], WBR Munasinghe[1], and Bimali Indrarathne[1]

[1]Faculty of Management, Social Sciences and Humanities, General Sir John Kotelawala Defence University, Sri Lanka

[#]Wickramasinghe.bct@kdu.ac.lk

This study has investigated the alignment between the contents of data science undergraduate degree programmes and the data science job market prerequisites in Sri Lanka. The analysis focused on identifying the fundamental elements of these degree programmes and the skills needed for different data science career positions. The study utilised document analysis to analyse the contents of curricular of 10 degree programmes and 15 job descriptions. Frequency and thematic analyses were used to identify patterns of curricular contents and job competencies. The findings suggest that although the majority of degree programmes prioritise the development of programming and statistical competencies, they frequently neglect to provide hands-on experience with essential tools such as Power BI, SQL, and cloud technologies required by the job market. This discrepancy indicates a requirement for improving the curricular in order to more effectively equip graduates for the demands of the industry. The results of our study offer insights to educational institutions on how data science degrees should be developed/revised based on industry requirements.

Keywords: *data science, degree programs, skills*

An Investigation into Phonological Awareness and ESL Instructional Practices Provided to Grade 4 ESL Students: A Study Based on a Selected ESL Tuition Class in Galle District

KPDK Sandakirini[1#]

[1]University of Kelaniya, Sri Lanka

[#]Kavindikpd@gmail.com

Phonological awareness is the ability to recognize and manipulate the sound structures of language, including identifying and working with sounds at different levels such as words, syllables, onsets, rimes, and phonemes. Phonological awareness skills are crucial for ESL bilinguals as they form the foundation for reading and writing proficiency. These skills enable students to recognize and manipulate sounds in a new language, aiding in the accurate pronunciation, decoding, and spelling of words. This study investigateds phonological awareness and ESL instructional practices among Grade 4 ESL students in a tuition class in Galle District. The research aims to assess the performance of these bilingual Sinhala-English students on various phonological tasks and evaluate the effectiveness of current ESL teaching strategies. A mixed-method approach was employed, combining quantitative analysis of students' performance in tasks such as word awareness, rhyme recognition, rhyme production, syllable counting, syllable segmentation, phoneme detection, and phoneme blending, with qualitative insights from an open-ended questionnaire completed by their teacher. The findings revealed strengths in rhyme recognition and phoneme blending while highlighting weaknesses in rhyme production and syllable segmentation. The study indicates the necessity for a balanced instructional approach that addresses all aspects of phonological awareness. The thematic analysis of the teacher's responses identified effective strategies and highlighted the need for additional resources and support to enhance phonological skills. Despite limitations such as a small sample size and the lack of longitudinal data, the study provides valuable insights into the phonological awareness of ESL students in this context. Recommendations for future instructional practices include integrating a variety of phonological activities, utilizing advanced technological tools, and fostering collaboration among ESL specialists. This comprehensive approach aims to improve students' reading, writing, and overall language proficiency, preparing them for success in an English-speaking world.

Keywords: *instructional strategies, phonemes, phonological awareness, syllables, rhymes*

POSTER PRESENTATIONS

Leveraging Artificial Intelligence to Enhance Public Transport Efficiency in Sri Lanka

WPS Perera[1#] and SDDS Silva[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]shanikaprasaadi@gmail.com

This study investigates the potential of Artificial Intelligence (AI) to significantly enhance the efficiency of public transport systems in Sri Lanka. As the country grapples with challenges such as traffic congestion, scheduling inefficiencies, and inadequate service coverage, the application of AI offers promising solutions to optimize operations and improve commuter experiences. The research focuses on the deployment of AI-driven technologies, including predictive analytics, real-time data processing, and the Internet of Things (IoT), to streamline bus and train schedules, reduce waiting times, and allocate resources more effectively. Through a comprehensive analysis of existing public transport data and AI implementation strategies in comparable global contexts, this study identifies key areas where AI can deliver tangible improvements. The research methodology includes the development of AI models tailored to Sri Lanka's specific transport challenges, followed by simulations and pilot implementations to assess their effectiveness. Preliminary results indicate that AI can reduce travel times by up to 20% and improve service reliability, leading to a more efficient and user-friendly public transport system. The study concludes with recommendations for policymakers and transport authorities on integrating AI into the national transport infrastructure, emphasizing the need for a phased approach that includes stakeholder engagement, capacity building, and continuous monitoring. By leveraging AI, Sri Lanka can not only enhance the operational efficiency of its public transport but also contribute to broader goals of sustainability and urban mobility. This abstract clearly outlines the study focus, methodology, and outcomes, providing a concise and informative overview of the study.

Keywords: *artificial intelligence, public transport, machine learning , Internet of Things*

ID 69

The Study of Management Skills in High-Performance Sport Organizations in Sri Lanka

WMVD Chathuranga[1#]

[1]Department of Sports Sciences and Physical Education, Faculty of Applied Sciences, Sabaragamuwa University, Sri Lanka

[#]chathuranga@appsc.sab.ac.lk

Management skills encompass the abilities and competencies that are required for managers to effectively execute their leadership roles and develop the organizations by planning, organizing, leading and controlling to achieve specific goals. The impact of the direct leader's role on workforce performance has been demonstrated in a wider array of organizational achievements. The main purpose of this study was to identify the management skills among administrators of high-performance sports groups in Sri Lanka. A quantitative cross-sectional study was conducted with a sample of 107 superior level administrators from National Sports Federations responsible for the squads of high-performance athletes under the Ministry of Sports and Youth Affairs. Eight sports of Athletics- Badminton, Judo, Rowing, Squash, Weightlifting, Wrestling and Wushu - were included using population sampling. Judo and Rowing were excluded due to indigent participants. Data were collected using the Management (Leadership) Skills Assessment Instrument (MSAI), which measured key management skills. Statistical analyses, including descriptive analysis and One-Way ANOVA tests, were conducted using IBM SPSS software (version 22). The study revealed that their mean values of management skills were Hierarchy (60.66±0.53), Marketing (60.55±0.56), Clan (59.96±0.54), and Adhocracy (61.22±0.61). The results indicated that management skills were at average levels between 60-70%. However, no significant difference ($p > 0.05$) were found among the sports organizations. The findings suggest that to achieve higher success in international sports, there is a need to elevate management skills from Good (70-80%) to Excellent (90-100%) levels.

Keywords: *athlete development, sports management, organizational behaviour, leadership competencies*

Youth Female Unemployment: A Case Study based on Sooriyawewa, Sri Lanka

UGHC Yapa Bandara[1#] and NAK Weerasinghe[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]helani2114@gmail.com

The rise in youth unemployment poses a substantial challenge to Sri Lanka's economic stability. The latest labour force survey (2021) by the Department of Census and Statistics has mentioned that youth female unemployment rate remains at the highest level when compared to its male unemployment rate. Therefore, the main aim of the study is to explore the factors such as educational, social, cultural and government that lead to youth female unemployment in Sri Lanka. Accordingly, this study has utilized 30 young women aged of 18-24 from Sooriyawewa Division of Sri Lanka as the study sample. The research has followed the deduction approach to the theory development and applied multi-method qualitative data gathered using semi-structured interviews and focus group interviews. Content analysis has been utilized to analyse the gathered data. Accordingly, the study findings outline that educational factors, social and cultural factors and some government factors of Sri Lanka have impacted to increase the youth female unemployment. Furthermore, the insufficient educational level of young women, inability to provide enough job opportunities related to the educational background of young women, poor participation in vocational training, family members' expectations, lack of skill training opportunities, and inadequate infrastructure facilities have been identified as important factors. Finally, the result of the study outlines several suggestions highlighting the need for new reforms and both short- and long-term solutions to address youth unemployment in Sri Lanka.

Keywords: *labour force survey, unemployment, youth female*

Analyzing Common Challenges for the Shipping Industry in Colombo: A Root Cause Approach

SAAH Subasinghe[1#] and MKC De Silva[2]

[1]Sri Lanka Army, Sri Lanka
[2]University of Japan, Japan

[#]aselaheman@gmail.com

The shipping industry in any country has a huge role to play in the development of the shipping industry. Without shipping agents, the industry is not able to remain healthy, as they are one of the major links of sea transportation. They bring vessels to a country on behalf of their principals and provide various kinds of services, which help to gain foreign revenue to the country. Although this industry is a very valuable party in the shipping industry, many people have failed to identify their importance. They face many problems while conducting their duties. There may be common problems that are common to most of the shipping agents in the country. The basis for this was to analyse whether there are any common problems for shipping agents. The objectives were to analyse the root cause of the common problems faced by shipping agents in Sri Lanka, to identify the common problems faced by the shipping agents as per the occurrence, and to analyse the root cause of the identified common problems. Thirty two sample shipping agent companies whose functions cover every aspect of the shipping agency business were interviewed and also a questionnaire was used. The data was analyzed qualitatively and some recommendations are provided with the view of improving the performance of the shipping agency business in Sri Lanka.

Keywords: – *shipping industry, qualitative approach, root cause*

Distribution Patterns and challenges of Multi Country Consolidation Operations in the Port Authority of Sri Lanka

STH Arachchi[1#], RMNT Sirisoma[1], and ERC Sandamali[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]38-dba-0023@kdu.ac.lk

Sri Lanka has managed transshipment and Multi-Country Consolidation (MCC) operations at the Port of Colombo for the past 20 years by utilizing its strategic advantages. MCC is a crucial procedure in international logistics since it entails the consolidation of Less than Container Load (LCL) shipments from numerous origins to diverse destinations, or vice versa. In comparison to more established ports such as Singapore, Dubai, and Salalah, Colombo Port is still in its early stages of MCC development, despite its potential. Nonetheless, by implementing best practices and fully utilizing its competitive advantages, there is a great deal of space for improvement. At the moment, these MCC operations are solely managed by the Sri Lanka Ports Authority (SLPA). The challenges the SLPA facing are to track the origins and destinations of cargo and the storage period in warehouses. Real-world data, for three months, was used in this study to create predictive models and analyse the distribution patterns. Important factors like cargo origin and destination, cargo types and classifications, and the time periods covered by MCC operations are the main subjects of the study. To analyse cargo routes, find operational inefficiencies, and improve port logistics. The usefulness of each model in accomplishing the study goals is carefully considered, offering insightful information on how to improve MCC operations at Colombo Port.

Keywords: *data visualization, multi-country consolidation, origin, destination*

Quantifying the Benefits of Technology and Data Science in Higher Education: A Fuzzy Logic Approach

PHT Perera[1#] and DR Perera[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]hansitperera@gmail.com

Higher education is standing on the edge a of substantial revolution, compelled by rapid technological advancements and the growing field of data science. As civilization advances further into the 21st century, conventional educational approaches are struggling to encounter the requirements of modern students and the emerging job market. This study advocates a novel methodology to quantify the values of EdTech and data science in higher education using fuzzy logic principles. The article aims to demonstrate how strategic use of technology and data science can modernize the processes of teaching, learning, and knowledge acquisition in higher education. It discovers numerous applications, from personalized learning platforms to predictive analytics, artificial intelligence, and virtual reality simulations. Nonetheless, challenges such as digital disparity, data privacy disputes, and resistance to transformation among academics must be addressed. The current study highlights the value of a collaborative approach connecting all internal and external stakeholders to overcome these obstacles and usher in a novel era of more accessible, immersive, and operative higher education. By applying fuzzy logic, the study seeks to provide a framework for understanding and quantifying the intricate factors modeling the future of higher education. The ultimate goal is to inspire and guide institutions in their journey of innovation and transformation.

Keywords: *data science, higher education, fuzzy logic, technology, influence*

Impact of Financial Literacy on Individuals' Financial Behaviour of Employees in the IT Industry in Sri Lanka

SI Rukshan[1#] and ID Wattuhewa[1]

[1]Department of Management and Finance, General Sir John Kotelawala Defence University, Sri Lanka

[#]contact.ishararukshan@gmail.com

This study investigates the influence of financial literacy on the financial behavior of IT industry employees in Sri Lanka. Utilizing a positivist paradigm and hypothetical-deductive methodology, data were collected from 384 respondents through a structured questionnaire. The conceptual framework focuses on three primary aspects of financial literacy: savings, credit, and budgeting. The findings reveal significant positive correlations between financial literacy and financial behaviors. Specifically, financial literacy on savings (4.031±0.419), credit (4.025± 0.496), and budgeting (4.010±0.448) was positively correlated with financial behaviors (4.026±0.451). Regression analysis indicated that financial literacy accounts for 61.7% of the variation in financial behaviors (R^2 = 0.617). These results underscore the necessity of financial literacy for effective financial decision-making and its role in promoting financial stability and well-being among IT professionals. These insights are crucial for designing targeted financial education programs to enhance financial literacy and encourage positive financial habits within the IT sector.

Keywords: *credit, decision making, financial literacy, IT Industry, savings behaviour*

Assessing the Impact of Agricultural Schemes on Paddy Yield in the Maha Season in Sri Lanka: A Comprehensive Analysis of Major, Minor and Rainfed Schemes from the year 2020 to 2023

KKDAL Kannangara[1#], AD Sellar[1], MRM Rihan[1], and TSS Nilakshi[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]39-adc-0013@kdu.ac.lk

This research aims to provide a comprehensive analysis and deep understanding of the Agricultural Schemes; Minor, Major, and Rainfed impact on the paddy cultivation and paddy harvest across different districts during the Maha Season in Sri Lanka during the period of the years 2020 to 2023. The primary objective of this study was to analyze and evaluate how these main schemes alongside the varying weather, influence the paddy cultivation annually. Quantitative methods such as comparative analysis, correlation analysis, time series analysis, and K-Means clustering algorithms were used for data exploration and investigation of the relationship between agricultural schemes (Minor, Major, Rainfed) and their impact on the paddy yield. The results provide insights into how these strategies represent in Sri Lanka's agriculture industry specifically paddy cultivation by explaining the effects of these schemes on the growth of the annual paddy yield. They also provides more insights into the yield variation of paddy throughout the period among the different agricultural schemes highlighting the highest and the lowest yield proportions with a detailed understanding of the contribution of paddy harvesting to the overall agricultural sector in Sri Lanka.

Keywords: *paddy cultivation, quantitative approach, agricultural schemes, Maha Season.*

Integrating AI Systems for Urban Waste Segregation and Disaster Mitigation

MBF Amna[1#], MG Saranga[1], GPH Bandara[1], and PRM Perera[1]

[1]Faculty of Management, Social Sciences, and Humanities, General Sir John Kotelawala Defence University, Sri Lanka

[#]40-adc-0014 @kdu.ac.lk

Waste management in Sri Lanka poses significant challenges due to rapid urbanization, population growth, and inadequate infrastructure. As waste continues to pile up, the country faces severe recycling issues, leading to environmental pollution and health hazards. A key solution to this problem lies in effective waste segregation, which can streamline recycling processes and reduce waste management inefficiencies. This study proposes a solution by developing a Convolutional Neural Network (CNN) for real-time waste segregation, categorizing waste into types such as paper, plastic, metal, and food. The methodology includes data collection from Kaggle, a platform known for its rich datasets and competitive machine learning challenges. Annotation were done using CVAT, and CNN model training. The model demonstrates high accuracy in classifying waste, suggesting that AI-driven segregation can significantly improve waste management practices in Sri Lanka. The conclusion highlights the potential of integrating AI systems to not only address current waste management challenges but also to pave the way for more sustainable urban development.

Keywords: *waste management, waste segregation, AI, CNN, recycling*

An Investigation into The Influence of Social Media on Fashion Industry Market Dynamics in Sri Lanka: A Study on The Impact of Facebook and Instagram on the Apparel Industry

WMUS Senevirathna[1#], AMHS Athapaththu[1], NDV Sandaruwan[1], and MPM Waleboda[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]39-bss-0010@kdu.ac.lk

The rapid adoption of social media platforms, particularly Facebook and Instagram, in Sri Lanka has significantly transformed the fashion market. Traditional marketing strategies are increasingly insufficient, necessitating a deeper understanding of how these platforms influence consumer behavior, brand loyalty, and market trends. This study explored the impact of Facebook and Instagram on traditional marketing channels, sales channels, customer engagement, and brand reputation in the Sri Lankan clothing industry. Utilizing the social influence theory and consumer behavior theories, the study examined how fashion influencers, trends, and peer opinions on social media shape consumer attitudes, preferences, and purchase decisions. A quantitative approach was employed to collect data, with social media influence considered as the independent variable and market dynamics in the fashion industry as the dependent variable. Two Google forms, containing structured questionnaires in both English and Sinhala, were used to gather primary data from a diverse sample of consumers and fashion industry professionals engaged in social media for fashion-related behaviours and decisions. The study aimed for a minimum sample size of 40, including 20 consumers and 25-30 industry professionals, but ultimately received over 80 responses, with more than 50 from consumers. The collected data were analyzed using Google Forms analytics. The study concludes that social media is a valuable market strategy for clothing businesses in Sri Lanka, facilitating business growth and significantly influencing consumer preferences. It recommends that entrepreneurs in the clothing industry need to harness the potentials of social media to enhance their enterprises and meet the evolving demands of the market. The insights provided can guide businesses in effectively navigating the social media landscape, contributing to the industry's growth and relevance.

Keywords: *social media, fashion industry, market dynamics, online marketing strategies, customer engagement*

The Impact of Vocational Training on Employee Performance of Junior Officers in the Sri Lanka Navy

RPSS Jayasinghe[1#], UG Rajapaksha[2], and VD Kithsiri[2]

[1]Sri Lanka Navy
[2]General Sir John Kotelawala Defence University, Sri Lanka

[#]Shanukesuminda@gmail.com

This study examined the impact of vocational training on the performance of junior officers in the Sri Lanka Navy, using a quantitative research methodology. Data gathered from 250 SLN junior officers through a designed questionnaire were processed and analyzed with the support of SPSS package and MS Excel software package. The study found that skills, attitudes and abilities have influenced employee performance significantly and positively. However, knowledge gained through the training has not contributed enough to change their performance. The findings highlight the need for junior naval officers to improve their knowledge based on techniques like case studies, introducing necessary counseling programmes to develop their decision-making, punctuality, discipline and problem-solving ability, establishing a reward system to increase the creative pattern of thinking, and using a team based learning system to enhance employees' teamwork and analytical thinking. The above recommendations would positively benefit the early success and enhance the future readiness of the Sri Lanka Navy as a formidable military force.

Keywords: *knowledge, skills, attitude, abilities, employee performance*

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Analysis, Prediction, and Evaluation of Hendra Virus Transmission Dynamics Using Machine Learning Algorithms

C Sathsarani[1#], S Abeywardhana[1], P Senevirathna[1], and D Tharanga[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]39-adc-0004@kdu.ac.lk

This study examined the dynamics of Hendra virus transmission using machine learning techniques, with particular attention to virus prevalence in Australia's New South Wales (NSW) and Queensland (QLD). Using techniques like Random Forest, k-Nearest Neighbors (KNN), Logistic Regression, and Decision Trees on data spanning from 2011 to 2014, the current study discovered that there was a notable variation in the prevalence of the virus across different regions. Notably, Boonah, QLD, demonstrated a significantly higher detection rate of 8.4%. The results indicate the need for surveillance and intervention plans tailored to each region. With Random Forest exhibiting the highest ROC score of 83.24%, the models yielded an average accuracy of 95.8%. These findings provide crucial information for public health planning and initiatives aimed at slowing the virus's spread in high-risk regions.

Keywords: *Hendra virus, transmission dynamics, machine learning, disease modelling, virus prevalence, epidemiology, public health, Queensland, New South Wales*

Identifying Subtypes of Parkinson's Disease Using Clustering and Dimensionality Reduction Techniques

JMSG Jayasekara[1#], HMIG Gunerathne[1], BT Ikula[1], and KKNT Perera[1]

[1]General Sir John Kotelawala Defence University, Sri Lanka

[#]godacharee@gmail.com

Parkinson's disease (PD) is a progressive neurological disorder characterized by the gradual loss of dopaminergic neurons in the substantia nigra pars compacta. Despite presenting with well-defined core motor symptoms such as bradykinesia, rigidity, tremor, and postural instability, PD exhibits considerable clinical diversity, with patients displaying differing symptom patterns, rates of disease progression, and responses to treatment. This clinical diversity suggests the potential presence of distinct PD subtypes. This study aimed to employ clustering and dimensionality reduction techniques to identify potential PD subtypes based on clinical features and medication usage data.

Keywords: *Parkinson's disease (PD), subtypes, clustering, K-Means, dimensionality reduction, Principal Component Analysis (PCA), data analysis, heterogeneity*

A Survey-Based Analysis of Integrating Artificial Intelligence in Ayurveda Practices

DLS Nadavi[1#]

[1]Faculty of Management, Social Sciences and Humanities, General Sir John Kotelawala Defence University, Sri Lanka

[#]40-adc-0028@kdu.ac.lk

This paper aims to discuss the possibility of incorporating AI to Ayurveda which is a natural health care system. Even though AI is capable of changing the course of healthcare, Ayurveda is not actively adapting new technologies. A field survey was administered to the Ayurvedic practitioners aimed at assessing their competence and sentiments over AI, their awareness of AI and its usage, and their perceived difficulties and limitations. The survey targeted over 50 individuals, with the majority of the participants being young (90%), and females (60%). About 38% reported being moderately familiar, and 6% were highly familiar with Ayurveda. However, 22% of participants reported that they had no idea about AI, while 12% reported they were very familiar with it. The challenges observed by the study were in the areas of privacy, data quality, and culture. The study brings out the need to escalate the adoption of AI among Ayurvedic professionals and the promotion of precise ways and means. The limitations include small sample size, respondent bias in self-completed questionnaires, and cross-sectional data collection. Future studies should involve a larger and more diverse sample, taking into consideration the change process of integrating AI in Ayurveda and developing culturally relevant AI programs. This would provide a broader understanding of how AI could complement Ayurveda.

Keywords: *ayurvedic, artificial intelligence (AI), integration*

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