TRACK 01
BUSINESS MANAGEMENT AND ECONOMICS

Impact of Government intervention on Kithul Production in Mawathagama

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Kithul (*Caryota Urens*) tree belongs to the family Palmae and grows in the wet zone of the country. The sap extracted from Kithul inflorescence is used for a vast number of highly demanded products such as treacle, jaggery, toddy, and vinegar with their indigenous medical values and especially anti-diabetic properties. Kithul is important in the regional development aspect, being a traditional agro-based cottage industry with low initiation cost and high return, which has a vast potential to expand and lead to reducing rural poverty and income inequality. There is a considerable gap between the supply and demand for genuine Kithul products in local and export markets, and the Government has already made some interventions to develop the industry. Kithul industry is found in four Grama Niladhari divisions in Divisional Secrete Division - Mawathagama. Though many government officials in the development sector have introduced new techniques in the industry, the community has not shown adequate progress. This research chooses to investigate factors involved in not performing both parties as expected and recommend measures to overcome them. Survey areas in the GN divisions were selected through convenience sampling as the Kithul industry is limited to a few GN divisions in the DSD. After identifying the most appropriate three GN Divisions, again convenience sampling was used for selecting informants for proceeding with the questionnaire. The survey was performed on 58 individuals in three GN divisions. Data analysis was done with mixed methods. Content Analysis was carried out with the information gathered from the Key Informant Interviews and focus group discussions. Information gathered through the questionnaire survey was analyzed using the quantitative method with Tabulation, graphical presentation, econometric tools, and correlation. Three independent variables of Government intervention in Knowledge, Marketing, and Regulating were tested against the dependent variable of Kithul Production in Mawathagama. It is identified that a medium-level relationship between Government intervention in knowledge enhancement and Kithul Production in Mawathagama, a weak relationship between Government intervention in marketing and Kithul production in Mawathagama, and no relationship between Government intervention in regulating and developing Kithul production in Mawathagama. Considering the hypotheses, it reflects that Government intervention is not significantly affecting the Kithul industry in Mawathagama. Therefore, it is recommended to enhance the government intervention in the

Kithul industry in all three aspects of Knowledge, Marketing, and Regulating measures with proper usage of ICT, which meets the changing needs of the modern customer, to achieve the goal of regional development.

Keywords: *Government interventions, Information communication technology, Kithul industry, Regional Development, Rural economy*

Impact of Economic Crisis on Micro-Entrepreneurs in Chavakachcheri Division, Jaffna District

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Due to the economic crisis that has plagued the country for the past three years, Sri Lanka has faced its greatest challenge ever. The ongoing economic and political issues in Lanka are currently characterized by high inflation and sporadic protests around the country. Small and medium-sized enterprises (SMEs) are essential to Sri Lanka's economy today because they provide equitable growth consistent with peacebuilding. Policymakers intentionally employ micro-entrepreneurship to uplift (post)conflict-affected people and support local economies. The growth of the country's socioeconomic system is heavily dependent on micro, small & medium enterprises (MSMEs). MSMEs are the backbone of the economy, contributing an estimated 52% of the gross domestic product (GDP). According to estimates, MSMEs in Sri Lanka are thought to be responsible for 45% of all jobs and 90% of all non-agricultural enterprises. In the non-agricultural sector, there are 1.028 million SMEs that employ nearly 2.265 million people, according to the Economic Census 2017/19 of the Department of Census and Statistics of Sri Lanka (DCSSL). The purpose of the study is to investigate the impact of the current economic crisis and recession on the micro-enterprises in the Chavakachcheri division in the Jaffna district. Semi-structured interviews were conducted with 30 conveniently chosen male and female micro business owners to gather data. Findings show that 18% of micro-entrepreneurs had temporarily shut down owing to fuel shortages, particularly in food-based businesses. Thirty-four percent of micro-entrepreneurs restricted operations due to raw material shortages, increased raw material prices, and decreased domestic and national demand for goods and services. Due to high production costs and poor customer demand, 60% of micro-entrepreneurs reduced their workforce by at least two employers, and 63% of micro-entrepreneurs had a reduction in annual turnover of over 75%. Additionally, 71% of micro-entrepreneur are struggling to meet major issues, including paying back loans and interest, canceling orders, not having enough savings, having trouble getting employees back to work, not getting any new orders, etc. Several distinct factors impacted MSMEs as lack of fuel and gas (58%), the low purchasing power of the community (51%), frequent power failures (81%), frequent price increases for products and services (78%), and a lack of raw materials (42%). The study emphasizes the significance of providing adequate short- and long-term financial support to micro-enterprise owners, with the hope that this will improve their performance and enable them to contribute to the country's economic progress.

Keywords**:** *demand, economic crisis, GDP, Micro Small & Medium Enterprises*

The Factors that Influence the Consumer Purchase Intention on Instant Food Products- With Special Reference to Jaela And Kandana Area

Sudarsha Kodithuwakku

Instant food products play a vital role in the Sri Lankan context owing to the busy lifestyle of the people. There are numerous brands and varieties of instant food items in Sri Lanka. Some of them are local products, and some have been imported from various countries. The instant food industry has emerged as a potential industry that can both flourish the economy as well as ease the lifestyles of people. The focus of this research is to identify the factors contributing to consumer purchase intention of instant food products in Sri Lanka, with special reference to the urbanized cities of Kandana and Ja-ela areas. The sample size was 100 respondents in the Kandana and Ja-ela areas, and the primary data needed for the study were collected using a questionnaire survey. The research objectives were achieved using various statistical tools such as the Pearson correlation coefficient, and regression analysis. The findings show that awareness, lifestyle changes, and socio-economic background create significant influence, while education level makes less impact on the purchase intention for instant food products. Furthermore, consumers expect high-quality food products, low prices, and good taste to be the same as fresh food by consuming instant food products. Hence, it is recommended to fulfill consumer expectations, increase awareness of instant food items, and induce the consumption of instant food products. There are opportunities for local instant food producers to foster a good image of local brands by outpacing imported instant food brands.

***Keywords**: awareness, Consumer expectation, lifestyle changes, local brands, Urbanized cities.*

The Effect of Job Satisfaction on Employee Retention in Insurance Industry: A study from ABC Plc.

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Employee satisfaction is a measure of how happy workers are with their job and working environment. In recent years, job satisfaction has become an area of interest among insurance professionals due to the high rate of turnover in insurance companies. Moreover, employee retention is a major concern in an organization's competitive advantage since it would have an impact on the organization's efficiency, productivity, and sustainability. In particular, employee retention is a process in which employees are encouraged to remain with the organization for a maximum time. Labor turnover has recently become a critical issue in the insurance industry, particularly in Sri Lankan competition. This study aimed to explore the level of job satisfaction's contribution to employee retention in the insurance industry. Fifty randomly selected insurance professionals from AIA Insurance Lanka PLC were selected for this study. A questionnaire was used to collect primary data, and secondary data, such as annual labor turnover, records on salary, intensives, and the number of days off, were obtained from the HR department of the company. The results revealed that there is a significant correlation between job satisfaction and employee retention. However, it was noticed that other factors such as Employee rewards, training and development, and Employee recognition were related to the intention to turnover in an insurance company. The study suggests that retention in insurance companies can be enhanced by increasing job satisfaction.

Keywords: *Employee satisfaction, Employee retention, the Insurance industry*

The Right to Health of Passive Smokers: An Analysis of Public Health Policies in Sri Lanka

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According to the World Health Organization, passive smoking causes 1.2 million deaths worldwide each year. Sri Lanka recorded a 10.8% rate of exposure to passive smoking in 2011, according to the non-communicable diseases risk factor study (NCDRS, 2015). Due to this problem, particularly vulnerable groups like children and women experience serious issues with violations of their human rights, particularly the right to health. Therefore, this study aims to outline the suggested measures for analyzing the current public health policies in Sri Lanka to safeguard the health rights of passive smokers. The data are gathered and analyzed using the doctrinal research design and primary and secondary sources. The primary sources, in this case, are legislation and judicial rulings. The data are gathered and analyzed using the doctrinal research design and primary and secondary sources. Constitutions, statutes, cases, and regulations serve as the primary sources in this case, while legal dictionaries, textbooks, journals, articles, case digests, legal encyclopedias, and other materials serve as secondary sources. Since there hasn't been a thorough examination of the current policy framework, the researcher intends to evaluate domestic public health policies connected to passive smokers' right to health in Sri Lanka and how they affect the entire population. Future politicians and decision-makers can take care while enacting legislation to prevent disruption of the peace and breaches of human rights. Human rights information and analysis are crucial for early warning and focused action. It affects how national and international governments formulate policies, strategies, and operational plans to avoid, lessen, or deal with upcoming crises, including humanitarian crises and armed conflicts. As a result, this research provides an analysis that assists public servants, decision-makers, and other accountable parties in improving Sri Lanka's political, economic, and social conditions to meet this evolving society's demands.

Keywords: *Human rights, Right to health, passive smokers, Public health policies, Sri Lanka*

Modeling the Impact of Population Aging on Economic Growth in Sri Lanka

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The economic growth of a country is one of the key determinants that determines the social well beings of the nation or people. Numerous factors, both directly and indirectly, have an impact on the economic growth of a country. Among them, the aging population is considered to be the more important factor. In recent decades a lot of attention has been paid to the growing elderly population, which has become a global phenomenon. Sri Lanka faces the issue of shrinking the working-age population as a result of the rapid increase of the aging population in recent years. This study was undertaken with the main aim of understanding how the per capita output growth of Sri Lanka is influenced by the aging population. In addition, it also assessed the impact of total factor productivity growth, and capital deepening (capital-labor ratio) in per capita output growth. The Cobb-Douglas production function, Solow's growth accounting, and Leibfritz and Roeger's notion of demographic effects on the labor market served as the foundation for the analytical approach used in this research. Secondary panel data (a combination of cross-sectional and time series data) from the world bank data source, the central bank annual report of Sri Lanka, and the Sri Lanka labour force survey were utilized to meet the study's objectives. The data were collected between 1960 to 2019. The evolution of labor market momentum was used to compute population aging, the widely utilized perpetual inventory method was used to create capital stock data and total factor productivity was assessed using the primal growth accounting approach. Further, to model the impact of an aging population, total factor productivity growth, and capital deepening on per capita output growth this study used a dynamic regression with an error ARIMA (Autoregressive Integrated Moving Average) model. The findings of the study revealed that the per capita output growth is positively influenced if the employment growth outgrows the total population growth. As a result, population aging has a negative effect on the per capita output growth of Sri Lanka. Also, capital deepening boosts per-capita output growth; as the capital-to-labor ratio rises, so does the economic growth of Sri Lanka. Likewise, the total factor productivity growth has a favorable impact on the per capita output growth; as total factor productivity growth rises, so does the economic growth of Sri Lanka. The findings of the study can be used to draw several policy implications for the betterment of our country as the government may take policy measures to combat this unfavorable development in output growth, including enhancing total

factor productivity, encouraging labor force participation, increasing the rate of capital deepening, and promoting technological progress.

Keywords: *Economic growth, total factor productivity, labour force, aging population, Time series model*

The impact of Logistic Service Quality on Customer Satisfaction in Omni-channel purchasing scenarios: Evidence from the Western province online consumers in Sri Lanka

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The study is conducted to determine the impact of Logistic Service Quality (LSQ) on customer satisfaction in omnichannel purchasing scenarios which are Buy in Store Ship Direct (BSSD) and Buy Online Pick in Store (BOPS) in the Western province of Sri Lanka. The LSQ impact on customer satisfaction in BSSD and BOPS purchasing scenarios is the research problem addressed in the study. Furthermore, only a few numbers of studies were found in this subject area and the main purpose of this study is to fill the identified gap. The objective of the study is to investigate how LSQ impacts customer satisfaction in BSSD and BOPS purchasing scenarios. LSQ is the desired quality that customers expect from logistical activities and availability, condition, timeliness, order accuracy and information quality are the designated factors to measure LSQ. The study was carried out using the deductive approach and the population of the study was identified as the Western Province of Sri Lanka, as most of the retailing companies who are operating omnichannel platforms are in this region. A purposive sampling method was used, whereas the sample size was identified as 384 omni-channel customers. Through an online questionnaire, the required data were collected separately for BOPS and BSSD Omni-channel purchasing scenarios, and a 5-point Likert scale was used to evaluate the impact of collected data. To analyze the collected data Regression analysis was used and a 95% confidence level was used as the significant rate. The results of the regression analysis discovered that timeliness, availability, and order accuracy impact significantly customer satisfaction in the BOPS Omni channel purchasing scenario, and timeliness, availability, and information quality impacts significantly to customer satisfaction in the BSSD Omni channel purchasing scenario.

Keywords*: Omni-channel retailing, Customer satisfaction, Logistic Service Quality.*

Impact of Micro Credit Financing on Rural Women in Karandeniya Divisional Secretariat Division

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Micro-credit financing is considered a significant tool for the socioeconomic development of women in developing counties. Rural women have been identified as a significant force in country development since empowering women is considered a successful strategic approach to poverty alleviation. But their participation in economic development reduces due to a lack of capital for investment. To fill the gap, a vast number of institutions in both public and private sectors, provide micro-credit facilities for rural women. These institutions offer micro-finance loans, easily accessible but at high-interest rates. Due to the attractive characteristic of easy access, it has become popular and has spread all over the country, making addicted followers. Since this micro-credit financing is actively based on rural women, discussing the impact of the same on rural women and revealing the special mechanisms to assure the positive impact on rural women is a significant topic in current research. This research chooses to investigate the extent to which micro-credit financing influences the economic, social, and psychological status of women in rural areas. Further, it chooses to understand the factors considered by women in taking MCF loans, analyze the impact of MCF on rural Women, find out factors that determine the impact, propose methods to improve the positive impact, and ensure the sustainability of MCF on rural women. The study was done with 10 in-depth interviews and structured questionnaires survey of 375 women in 10 GN divisions in Karandeniya DSD, using mixed method analysis. This study focuses on examining the impact of microcredit on rural women to conclude the relationship between microcredits and women's economic, social and psychological status. This study identified that micro credit exhibit a significant relationship with the economic, social, and psychological status of rural women, also found that even though women prefer micro-loans at low-interest rates, they were ready to take loans from less-documented institutions that provide micro-loans at high-interest rates. Further, it identified that the type of impact depends on the purpose of the loan. So, policy should be formulated to ensure the positive impact of micro-credit financing on rural women considering less documentation, short duration with a simple procedure for providing micro-credit, and confirm the use of credit for a productive purpose. And also, it is recommended to introduce relief and guidance methods for problems related to the loan payment. Furthermore, it is identified that

transaction digitization in micro-credit financing facilities can play a vital role in terms of women's empowerment by improving efficiency and transparency.

Keywords: *Micro Credit Financing; Rural Women; Economic, Social and Psychological Impacts; Digitization; Sustainable women empowerment*

Revisiting the Impact of Bank Size and Performance: Evidence from the Listed Commercial Banks in Sri Lanka

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Bank performance is influenced by a variety of factors and, bank size is a major determinant among them. The majority of the research regarding bank size has been undertaken in developed countries, and these studies have revealed conflicting results regarding whether bank size affects performance. Further, the applicability of these results to emerging countries is also questionable due to the different contextual settings. Therefore, the purpose of this study is to explore whether the bank size affects the performance in Sri Lanka.

The population of this study includes all the listed commercial banks in Sri Lanka. Data were gathered from published annual reports and the Central Bank data library for the period of 2011 to 2021 for the domestic private banks which were listed in CSE as of 31st May 2022. The performance was measured by using ROA and NIM. The natural logarithm of total bank assets, total income, and market capitalization was used to measure the bank size. Further, operating cost, capital adequacy, and liquidity risk remain the control variables of the study. The study analyzed the data using pooled OLS regression model. Even though the study contains a panel data set, pooled OLS regression analysis was carried out instead of panel regression to analyze the effect of bank size on profitability due to the time constraints of the research.

In the banking context, scale economies exist when the cost per rupee of loans or assets declines as the number of loans or assets increases. An efficient bank is operating at the lowest cost per rupee of assets or loans. Results of this study indicate that size measure under the log of total assets negatively affects performance. Bank assets have a negative effect on performance measures under net interest margin. This could be due to bureaucratic reasons and high maintenance costs.

Increased asset base results in decreased financial performance. Hence, banks cannot improve their financial performance by increasing the total assets of the firm. This proves the nonexistence of economies of scale in the sector. This effect arises due to bureaucratic effects and, the findings of this study imply policymakers and government. They can reduce the tight existing governing policies on large banks to increase their profit margins. Finally, market share has a significant positive impact on both accounting and market performance measures.

This finding implies banks can increase their market performance by increasing the total deposits of the firm. Increased deposits signal better performance of the banks and lead to an increase the market performance.

Keywords: *Bank size, bureaucratization, economies of scale, Performance, profitability*

Effect of Ownership on the Performance of Licensed Commercial Banks in Sri Lanka

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Despite the availability of many studies on the ownership-performance association, existing literature provides contradictory evidence on the effect of ownership on bank performance. Therefore, this study examines the effect of ownership on the performance of licensed commercial banks in Sri Lanka using annual data from 2012 to 2021. The data was collected through published annual reports of 18 licensed commercial banks in Sri Lanka. Bank ownership was categorized as state, private, and foreign and measured using two dummy variables. Return on equity, net interest margin, and non-performing loans were used as proxies of bank performance. A random effects panel regression model was used to explore the effect of ownership on bank performance while controlling for bank size, loan-to-deposit ratio, income diversification, and management quality. The findings suggest that state-owned banks perform better than other banks in terms of return on equity. However, their performance in terms of net interest margin and non-performing loans was not significantly different from other banks. Moreover, private banks outperform other banks in terms of return on equity and non-performing loans while their performance in terms of net interest margin was not significantly different from other banks. Therefore, this study does not show a straightforward association between ownership and bank performance. Instead, this association varies depending on the indicator used to measure bank performance. Nevertheless, this study provides recent evidence of the effect of ownership on bank performance in Sri Lanka. Further, the findings of this study will provide insights for the government, banks, and policymakers in formulating appropriate policies to improve the performance in the banking sector.

Keywords*: commercial banks, ownership, bank performance, Sri Lanka*

A Zestful Formation of Quad and Its Dynamic Relationship in the Stock Market: An EmpiricalStudy Among The Member Nations

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The study attempts to analyze the dynamic relationship between the stock indices of Quad member nations. The study has used daily stock index data for the period starting from 15th September 2017 to 15th September 2022. In this study, Johansen's Cointegration Test, and Vector Error Correction Model for testing the long-run and short-run causality have been applied for determining long and short-run relationships among the stock indices of the USA, Australia, India, and Japan. The cointegration result exhibited a long-run relationship between the four stock indices. The VECM framework disclosed a long-run causality from ASX and BSE stock indices to other indices but the study revealed that there does not exist a long-run causality from JPX and Dow Jones to other stock indices. At the same time, short-run causality determined through the Wald test has revealed that there is no short-run causality from JPX to ASX and from BSE to JPX. The study has found that with the lack of long-run and short-run causality among some of the indices used in the study, there is a scope for diversification in investment in these international markets.

Keywords: *Wald test, Johansen cointegration, unit root, causality, stock index*

TRACK 02

ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY

A Preliminary Assessment of Microplastics in Sediments of Tissa Wewa Reservoir and Malwathu Oya River in Anuradhapura, Sri Lanka.

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Plastic pollution is a growing concern all over the world including in Sri Lanka due to serious negative consequences. Thus, the current study focused on the investigation of the occurrence, and quantification of visually observed microplastics (MPs) in sediment samples from Tissa wewa and Malwathu Oya in Anuradhapura during May 2022. The dried sediment samples were passed through 1 mm and 5 mm mesh sieves and < 1 mm MPs were subjected to density separation with NaCl and KI followed by Peroxide Oxidation. Visually observed and recovered MPs were observed through Trinocular Microscope, enumerated for color, and confirmed by hot needle test.

As results revealed, the total MPs in Malwathu Oya was 20.38±3.82 kg^{-1}dw whereas 49.17±5.77 kg^{-1}dw of MPs were detected in Tissa wewa. In terms of colors of MPs, in Malwathu oya, white-colored particles were dominant (44.00%) while black color MPs (35.59%) were dominant in Tissa wewa. The number of MPs in Tissa wewa (Mean rank – 25.64) was statistically significantly higher than the Malwathu Oya (Mean rank – 17.36) ($U = 133.5$, $p = 0.024$). This may be due to the lentic nature of Tissa wewa which has a higher amount of MPs since slower flow rates may lead to the accumulation and settling of MPs in sediments.

More research is needed concerning MPs concentrations as a function of seasonality and understanding the drivers of MPs abundance would greatly benefit assessing their environmental impact.

Key Words*: Microplastics, Freshwater, Sediment*

Sustainable management of e-waste in the Sri Lankan context: A business perspective

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As a result of rapid innovations in the evolution of technology, the usage of technical equipment and E-Waste has soared within the last few years. Human health and the environment are threatened by E-Waste due to its hazardous content. E-Waste has become a critical global problem due to its adverse influences on human health, the environment, and the development of most countries, including Sri Lanka. The situation has worsened more because of damaging consumer behavior towards E-Waste disposal. Lack of awareness about the adverse effect of E-Waste has strengthened the informal recycling practices in most developing countries. Moreover, Landfilling and informal recycling methods have discouraged formal recycling sectors. Government, manufacturers, and consumers have equal responsibility to implement proper E-Waste recycling strategies to achieve sustainability and environmental management. Not having proper E-Waste recycling policies is the main reason for the growth in informal recycling practices. The responsible parties can take action to encourage the formal E-Waste management sectors to gain environmental sustainability while earning economic benefits. Consumers can contribute to the process of proper E-Waste management without improper disposal of E-Waste. As the fundamental step, enhancing awareness regarding E-Waste takes the key role due to it leading to following formal disposal methods of E-Waste. This will no longer be a burning problem if all parties do the proper recycling practices without considering it a burden. Investigating the innovations and policy-level interventions on the public perception and awareness helps to manage E-Waste sustainably. By analyzing the public perception of E-Waste, the study has identified that a sustainable E-Waste management system can be carried out by enhancing awareness among the public. Moreover, due to approximately 50% of the respondents being dissatisfied with the current management of E-Waste, the government and manufacturers have a responsibility to take appropriate actions to develop the E-Waste management system. In the Sri Lankan context, E-Waste businesses can lead the economy by having improved infrastructure such as machinery and legal provisions. According to the study, Sri Lanka has the potential to develop the E-Waste industry into a global level market while achieving sustainability.

Key Words: *E-Waste, Recycling, Awareness, Sustainability, Sri Lanka*

Investigation into the citizens' awareness and willingness to participate in e-waste management in Thimbirigasyaya

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The use of electronic items by households in Sri Lanka is on the rise. By the first half of 2020, one in five households owned a laptop/desktop. A three-fold increase in telecommunication device use was observed within a year, from 2019 to 2020. With such e-goods usage, households are regarded as one of the largest generators of e-waste, where the e-waste is discarded with other household wastes. Such haphazard disposal of e-waste bears negative health and environmental consequences. To overcome this issue, awareness alone of proper e-waste disposal is insufficient. According to the Theory of Planned Behaviour (TPB), Ajzen has shown that the intention/willingness to behave in a certain manner, is a predecessor of the actual behavior. Such willingness is determined by attitudes, subjective norm (SN), and perceived behavioral control (PCB). Literature has shown how this model can be extended to include other variables, as appropriate. In that context, this research aims to identify the association of attitudes, SN, PCB, awareness, and previous recycling experience (PRE) (extended TPB model) on willingness to engage in e-waste management. A quantitative survey was carried out with primary data collection from 400 respondents of Thimbirigasyaya Grama Niladhari Division and analyzed using statistical techniques such as the Chi-Square test of independence and Pearson correlation coefficient. Chi-square analysis indicated associations between willingness and each of the five variables (p-value <0.00 of all variables). The Pearson correlation coefficient results indicated that attitudes (*r value= 0.48*), PBC (*r value= 0.47*), PRE (*r value= 0.39*) showed moderate positive relationships with the willingness to engage in e-waste management, while weak positive correlations between awareness; r (398) = 0.27, $p < 0.001$ and SN; r (398) = 0.26, $p < 0.001$, against willingness, was observed. Therefore, implementation of awareness and educational programmes are important to create stronger attitudes, simplicity of the process of e-waste recycling must be communicated, and more opportunities must be created for public engagement, thereby creating e-waste recycling habits in the long run. Due to the stronger connections that attitudes and SN had with the involvement of friends and family, awareness and educational programmes aimed at attitude building must highlight the negative health implications of non-recycling.

Determination of Air Pollution Distribution Using a Geospatial Analysis Technique

MDMDS Meegaswatta

The environmental assessment that is carried out for development operations involves monitoring as one of its fundamental requirements. Environmental monitoring during the execution of a project acts as an environmental performance indicator. It illustrates the extent of the environmental damage caused by continuing construction activity. It demonstrates the magnitude of the environmental damage caused by continuing construction activity. The Ecosystem Conservation & Management Project, a building project funded by the World Bank and carried out in Nuwara Eliya, Sri Lanka, served as the basis for this study. The primary goals of this project are to renovate and modernize the Sri Lanka Forestry Institute's current training facilities (SLFI). Air pollution is one of the main factors taken into account while conducting an environmental impact assessment (EIA) or initial environmental examination (IEE) for a development project. Understanding and reducing the potential environmental impact of the proposed project is the sole purpose of the EIA or IEE. To reduce air pollution, the EIAs/IEEs suggest mitigation strategies. These suggested mitigation strategies would eventually be used throughout the project's construction phase. Though it is unknown how the implemented control measures will affect air quality during the construction period. Consequently, this study established a GIS-based air quality model and evaluated pollution dispersion as a response to thisresearch problem. Understanding the pollutant dispersion from the project site to the surroundingenvironment was one of the study's key goals. This objective served as the foundation for choosing sampling locations and conducting air quality monitoring. Additionally, while selectingthe sampling locations, the adjacent land use pattern and wind direction were taken into consideration. The interpolation technique was used to derive the main distribution patterns of each monitoring parameter during the analysis. Many different interpolation methods are incorporated into GIS, including IDW, Kriging, and spline. These methods are mostly employed in investigations of air pollution. IDW is employed when the set of points is dense enough tofully represent the degree of local surface variation required for the analysis. Subsequently, the average concentration of each parameter was determined using the Zonal Statistics technique every 50m. Contrary to what has often been assumed, the air quality has been slightly impacted by project construction operations, however, the impact is minor and unevenly distributed.

Keywords: *Air Quality, GIS, Interpolation, Modeling, Environmental Assessment*

Treatment of Lead containing wastewater by Adsorption process using drinking water treatment plant residues

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Lead (Pb^{2+}) is a pollutant that causes serious health issues. It is also bioaccumulated through food chains affecting the ecosystem's health. Drinking water treatment plant residues are being produced in large quantities in drinking water treatment plants and disposed on landfills exacerbating solid waste problems. Adsorption is an effective wastewater treatment method for removing heavy metals from wastewater. The present study investigated the performance of drinking water treatment plant residues produced during the water treatment process in a drinking water treatment plant for the removal of Pb^{2+} in aqueous solutions by adsorption. The effect of pH, initial Pb^{2+} concentration, and contact time on the adsorption of Pb^{2+} onto drinking water treatment plant residues were examined. The adsorption mechanism of Pb^{2+} onto drinking water treatment plant residues was described using isotherm and kinetic models. The experiments on the effect of pH showed that adsorption of Pb^{2+} slightly increased from 8.18 ± 0.14 mg g^{-1} to 9.19 ± 0.15 mg g^{-1} with the increase in pH 3 to 8. The maximum adsorption capacity of Pb^{2+} was 16.1 mg g^{-1}. Pb^{2+} adsorption was well fitted to the Langmuir isotherm model indicating monolayer adsorption on a homogeneous adsorbent surface with identical active sites. The experiments on the effect of contact time on adsorption showed that the adsorption of Pb^{2+} onto drinking water treatment plant residues increased with the increase in contact time and reached the equilibrium within 2 hours of contact time. The kinetic studies showed that the adsorption of Pb^{2+} onto drinking water treatment plant residues was well described by both the pseudo first-order model and pseudo second-order model indicating that both chemical and physical adsorption contributes to the adsorption of Pb^{2+} onto drinking water treatment plant residues. Therefore, this study proves that drinking water treatment plant residues are an effective, low-cost adsorbent for removing Pb^{2+} in aqueous solutions. Hence, future studies are required to be conducted on the field-scale application of drinking water treatment plant residues which will be beneficial for cost-effective wastewater treatment, especially in developing countries.

Keywords: *Heavy metals, Isotherm models, Kinetic models, Sludge, Water treatment*

Removal of nitrate and phosphate from wastewater by using activated carbon produced from *Limonia acidissima*

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Adsorption is an important technique used in the purification, separation, and recovery of unwanted chemicals from wastewater and industrial processes. Among different types of adsorbents, activated carbons (AC) are the most widely used, because of their high adsorptive capacity. Any cheap material with high carbon content and low inorganics can be used as a raw material for the production of AC. Containing a high microporous structure, high internal surface area, pore volume, and pore size distribution are increasing adsorptive capacity. This study used wood apple (*Limonia acidissima*) shells as a starting material for the preparation of AC using both physical and chemical activation methods. The varying dose of adsorbents (0.5 – 6 g/L) and varying contact time (30 - 240 min) were used to determine the optimum dosage and optimum contact time using isotherm and kinetics experiments respectively. Chemical-activated wood apple activated carbon (CAC) which is soaked in zinc chloride and physically activated wood apple activated carbon (PAC) showed a correlation between Nitrate removal and AC found to have optimum nitrate removal at 62.53% and 16.82% respectively. Based on the statistic the level of nitrate removal with CAC showed a significant (P value – 0.002) compared to PAC (P value – 0.026). Therefore, CAC is the suitable activated carbon for nitrate removal in wastewater. The results of paired sample t-test for the nitrate removal efficiencies of PAC vs. CAC P- value was 0.003. It was statistically proven that there was a significant difference in nitrate removal in PAC and CAC with that CAC showed a significant amount of nitrate removal from wastewater than PAC According to the above results, zinc chloride-soaked activated carbon can be used to treat nitrate removal from wastewater in a cost-effective and environmentally friendly manner.

Keywords*: Significant removal, Chemical activated, zinc chloride*

Feasible Solutions to Kelani River Pollution from High polluting industries under BOI Sri Lanka: “An Exploratory Study"

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The Kelani River basin which provides a precious source of potable water for Colombo and the suburbs was declared an environmentally sensitive area in 1993 by a cabinet decision, prohibiting new high-polluting industrial establishments upstream. The common wastewater treatment Plant (CWWTP) which is situated at the Biyagama export promotion zone (BEPZ) is the largest wastewater treatment plant belonging to the Board of Investment (BOI) of Sri Lanka. At, present, this Treatment Plant is operated by the national water supply and drainage Board. (NWSDB).

Currently, 54 factories are functioning in this zone and wastewater generation is approximately 220000 m^3/day. Out of the above 54 factories, 9 belong to type "A" industries that discharge effluents that are toxic and harmful to human health. Further, these industries have their wastewater treatment plants treat wastewater chemically in-house until it meets the zone's tolerance limit for discharging industrial wastewater into CWWTP. Though the industrial effluents generated within the export promotion zone at Biyagama are treated in a common wastewater treatment plant, water pollution in the Kelani River has surpassed the environmental thresholds. This paper investigates feasible solutions to optimize the overall quality of the treated effluent discharged into the Kelani River in the long run.

A mixed-method research design was adopted to conceptualize an optimal framework. Effluent quality data and observations of the NWSDB of Sri Lanka and the BOI of Sri Lanka as evidence. The management feasibilities of the BOI and NWSBD were qualitatively evaluated.

As per the analysis of the results of this study, it was observed that the root causes for 100% of non-conformities happened due to partially treated wastewater discharges from fabric washing plants of 3 type A industries. In addition, BOI at BEPZ does monitor the quality of industrial effluent discharges per industry twice a month to CWWTP. However, these Industries are operating 576 hrs. per month. Therefore, BEPZ, monitoring, and enforcement of regulations efficiency per month is 0.3%. During the covid season, this percentage decreased to closer to zero. Some type A industries have reported on functioning without any operators for their wastewater treatment plants during the COVID-19 pandemic. Having considered all of the above facts, it is noted that the current administrative infrastructure responsible for the effluent quality monitoring and enforcement of regulations, which is the BOI at BEPZ has significant inefficiencies. Furthermore, the potential of the CEA or NWSDB to intervene in process optimization is consequential. Therefore, this paper suggests transferring the responsibility of effluent quality monitoring and enforcement of regulations of in-house industrial treatment plants from BOI to bodies such as CEA, NWSBD, or any other independent agency.

Role of the Dissemination of Climatic Information on the Livelihood of Fishing Community in Beruwala

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Fisheries as an industry contributed 1.0% of the national GDP where 76% is from marine fishing in 2021. Still, the living standards of the fishery community are at a low level as the safetyand ability to earn an income from the fishery are highly dependent on climate changes and general weather pattern changes. A proper system of climatic information dissemination is required to uplift the livelihood of the coastal fishing community. This research is an attempt to uncover the role of the dissemination of climatic information on the livelihood of the fishing community in Beruwala. Primary data were collected using a questionnaire survey (n=50) conducted both in-person and through telephone interviews. Key informant discussions, groupdiscussions, and field observation were also conducted for primary data collection. Simple random sampling was used to select the respondents. Data were analyzed using descriptive statistics. According to the results (80%) of respondents were day boat fishermen and (20%) were multi-day boat fishermen. The respondents were at 51 years of mean age, earning 48,000 LKR as their average monthly income. Gender distribution was (82%) males and females are not directly involved in a sea voyage. Most of the respondents have an education level up to GCE O/L. The majority(98%) of respondents have faced economic losses and more than (50%) have faced vessel andfishing gear damages, low fish harvest, coastal erosion, and sea level rise due to bad weatherand climate change. Mostly searched climatic information is rainfall and wind. The majority (36%) used television and radio weather forecast to get climatic information and (20%) aredepending on their own experience in decision-making under weather patterns. The Reliabilityanalysis (Cronbach's coefficient alpha test) is conducted to measure the internal consistency ofthe variables and ensure the reliability of the questionnaire. The chi-square test of independence was conducted to test the association between the expected characteristics of climaticinformation dissemination systems and livelihood outcomes. The results revealed that quality of information, timeliness, understandability, perceived usefulness, and perceived ease of use was associated with the livelihood outcomes of the coastal fishing community. The study concludes that properly designed climatic information dissemination is affected the livelihood of the coastal fishing community to prevent or reduce the damages from adverse weatherconditions and climate change.

Keywords: Climatic-information dissemination, Weather, Climate, Fisherman, Livelihood

TRACK 03

EDUCATION AND LINGUISTIC STUDIES

Adaptation and Validation of the Strengths and Weaknesses of ADHD Symptoms and Normal Behavior (SWAN) Scale among 5 - 12-Year-Old Children in Colombo District

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Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder and is characterized by persistent age-inappropriate core symptoms of inattention, hyperactivity, and impulsiveness that could result in impairment in one's major life activities and well-being. Hence, early identification, and prompt treatment are essential. Clinicians and researchers have mostly used screening tools to assess ADHD, however lack of culturally adapted and validated screening tools in the Sri Lankan context hinders the early identification of ADHD in children. The Strengths and Weaknesses of (Attention Deficit Hyperactivity Disorder) ADHD symptoms and Normal behavior (SWAN) rating scale is based on DSM-5, a dimensional approach to assess the symptoms of ADHD and has 18 items with a 7-point rating to measure the full range of behavior of an individual. This study aimed to adapt and translate the SWAN scale to the Sinhala language by establishing content and consensual validity and measuring the construct, and criterion validity along with assessing the reliability. This is a cross-sectional, correlational study. The research was carried out in two phases; Phase 1: translation of the SWAN scale from the English language into Sinhala using systematic, standardized procedures for adapting and validating cross-cultural research instruments employing the Delphi process, and the qualitative analysis was carried out. Phase 2: The quantitative data were analyzed utilizing the SPSS 25 statistical software package (SPSS, 25). The psychometric properties of the SWAN Sinhala scale were established using a community sample of 220 parents of school children who were between 5 and 12 years old in the Colombo district. Also, a clinical sample of 50 parents of children that were diagnosed with ADHD at Lady Ridgway Hospital, Colombo. Construct validity of the community sample was measured by conducting convergent validity, divergent validity, and Exploratory Factor Analysis (EFA). The reliability of the SWAN scale was measured using the community sample and achieved internal consistency reliability Cronbach's alpha value 0.96 as excellent. The test-retest reliability stability was excellent (0.96). The clinical utility of the Sinhala SWAN scale was examined by executing criterion validity through resulting good concurrent validity. Moreover, convergent validity was agreeable, and obtained adequate exploratory factor loadings and structures in the

community sample. In conclusion, the SWAN Sinhala version retains sound psychometric properties as of the original SWAN and is a valuable instrument to screen ADHD among children from 5 to 12 years in Sri Lanka.

***Keywords**: SWAN English, SWAN Sinhala version, ADHD, Children, Validity*

Agricultural economics research article introductions: A genre analysis

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English is the lingua franca of the academic publishing industry today. Due to the globalization and marketization of the academe, scholars are under increasing pressure to publish in English medium-indexed journals, a vital performance indicator for career and academic mobility (Flowerdew, 2007). Both the conventions of academic English discourse and the higher-order skills required in expository scientific writing are daunting challenges for scholars who aspire to publish in international journals. The Introductory section of a Research Article (RA) poses the greatest challenges to writers, whose L1 is not English, in terms of persuasive writing skills and strategic presentation to impress the gatekeepers of international academic publishing. This genre-based study draws insightful pedagogical implications for the designing of ESP academic writing instructional material and thereby helps expand novice writers' understanding of disciplinary-specific academic writing. Using Swales' CARS model (1990,2004) the study explores the rhetorical structure of 10 RA introductions published in a Sri Lankan journal in agricultural economics to identify, categorize and critically analyze the rhetorical organization and linguistic strategies and the potential impact of these choices in terms of how their research is positioned within their discourse context. The framework of Move Analysis was adopted in coding and interpreting the data. In cases where the model was inadequate Kanoksilapatham (2012) was referred to. A pragmatic non-probability sampling technique was also applied. Both quantitative and qualitative approaches were adopted. The study found that the writers possessed a fairly competent understanding of general academic conventions. Discipline-specific discourse demands were also evident. The data discerned a linear rhetorical pattern. The study also established that Swales' model is largely applicable in the sub-discipline of agricultural economics. The writing was largely prescriptive, restrained, and standardized. The writers' stance towards academic writing seemed to have a major impact on their rhetorical choices, thereby shaping the rhetorical structure. Linguistic realizations were key to delivering the desired communicative goals. The 'face-saving' approach was supplemented with an 'author evacuated' style of writing and linguistic choices. Reasons for the rhetorical and linguistic choices of the authors are tied to larger social, cultural, and economic contexts of the writers and their publishing contexts. The findings also highlight the importance of considering

disciplinary-specific characteristics, mastering existing conventions before attempting innovative writing, and studying the rhetorical structure and style of internationally published research communications. The findings bear pedagogical implications that can inform the designing of ESP instructional material and thereby help novice writers publish successfully.

***Keywords**: RA introductions, genre analysis, Swales' model, academic publishing, ESP*

Contribution of guidance and counseling to improve the discipline of the students in secondary schools in Badulla district, welimada educational zone

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The goal of the study was to investigate how counseling and guidance may improve student behavior in secondary schools in the Welimada Educational Zone of Badulla District. Albert Bandura's humanistic philosophy and the theory of personality served as the guiding principles of the study and a descriptive survey research approach was used. Purposive sampling was utilized to choose a sample from the whole population that included 8 schools, 8 administrators, and 8 school counselors. To choose 24 teachers and 262 students from the chosen school, stratified random sampling and simple random sampling were both used. Questionnaires and an interview schedule were the tools utilized to gather data for the study. Descriptive statistics, including frequencies, percentages, mean scores, and the Statistical Package for Social Science, were used to analyze the data (SPSS). Results showed that teachers use a dynamic approach to a group of students' interactions. Additionally, the computer resources available were insufficient for the process of guiding and counseling and the children's behavior and academic performance have improved thanks to supervision and counseling. There is sufficient evidence to show that a lack of student supervision and counseling contributes to indiscipline in the classroom but because there isn't a clear legal or regulatory framework, there aren't enough qualified teacher counselors, and instructors have too much work to do, it's challenging for guidance and counseling to be effective in fostering student discipline. To resolve conflicts, discussion must be encouraged. This may be improved by fostering strong bonds between the students, counselors, instructors, and administrators so that they feel free to express their opinions on matters that concern both sides.

Keywords: Guidance and Counseling, Students Disciplinary, Pupils, Counsellor, Teacher

Relations between Teacher Reasoning, Knowledge and Practice in Teaching English as a Second Language

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The current view of classroom pedagogy observes the teacher as a developer of independent teaching forms on teacher knowledge. In this context, it is assumed that teacher decision-making in terms of reasons giving approach to pedagogical decision-making on knowledge has close connections to teacher practice. Contemporary studies recognize the importance of examining this concern to better understand what teaching is. This study observed the phenomena from an eclectic post-method perspective in teaching English as a second language (ESL). The study employed a qualitative multiple case study framework with three English language teachers selected using a convenience sampling method. The data collection procedure followed the framework of interpretative phenomenological analysis and hermeneutics. Primary data sources were two-fold; think-aloud verbal data in the form of short narratives and videotaped teaching sessions of teaching reading lessons for the English for Social Sciences classes to first-year art undergraduates. Qualitative content analysis mechanisms were used to analyze and describe the nature of the connections between pedagogical decision-making on teachers' interactive cognition in selecting and implementing classroom practice strategies. Preset codes were used to identify connections between these constructs. The analyses are presented in both thematic and graphic forms to show the connections between the main constructs. The results confirmed a strong agreement between the teacher's pedagogical reasoning on interactive cognition in choice-making pedagogical strategies. This condition provides evidence for personal forms of teacher practice in English language teaching. This manifestation was observed in a dual state of teacher interactive knowing; in single and multiple-arrangement relationships. Furthermore, this flow of demonstration was observed as both intentional and throughout, confirming solid connections between teacher reasoning in pedagogical decision-making, on cognition in teacher practice in ESL. These insights can be taken into account in teacher education, evaluation, and professional practice in ESL. Furthermore, these connections indicate that teachers' reasoning on teacher cognition can be used as a frame of reference for eclectic practice in the formation of personal pedagogical practice systems (PPPS). The results also provide insight into the

explanation of eclectic pedagogy concerning teacher cognition. Future studies may utilize the concept of PPPS in the study of pedagogy in any area of teaching and particularly in teaching ESL, as well as in studying the pedagogy of all other professions. Studies can also use the interpretive phenomenological framework and think-aloud method to survey and observe professional thinking in decision-making while in practice. Further studies can be designed with many case participants to understand whether certain categories of cognition versus others appear in the pattern formation of pedagogical practice.

Keywords: *reasoning-in-action, interactive cognition, stimulated think-aloud oral Protocol, Interpretive Phenomenological Analysis, Personal Pedagogical Practice Systems in ESL*

Significance of Needs Analysis within a Proficiency Course in English: Addressing the needs of the undergraduates of the Faculty of Law – University of Colombo

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Within the field of English Language Teaching (ELT), the concept of Needs Analysis (NA) plays a significant role, specifically in curriculum design and material development. NA refers to the processes involved in gathering information about the needs of a particular client group in industry or education. In this study, this concept has been practically used to gauge the English language-related needs of the law undergraduates of the University of Colombo, both within and outside the university. The Needs Analysis Approach introduced by Brown (2009) is the fundamental methodology used in this study. Level 3 law students who follow the Proficiency Course in English (PCiE) offered by the Department of English Language Teaching (DELT), University of Colombo are focused on this NA. A mixed methodology was used in this study, where a survey and an interview were used as the main tools. Out of ninety-five Level 3 students, twenty-five students responded to the survey and a recently graduated lecturer participated as the respondent of the interview. The quantitative data collected from the survey and the qualitative data collected from the interview were triangulated together to enhance reliability and validity. From the selected sample of students, reading-related skills seem to be significant during their undergraduate period and mastery of English speaking was highlighted as the most required skill after graduation. Moreover, most of them felt that their speaking skills were lacking and wanted to focus more on improving their spoken English. These findings were incorporated into the classroom teaching and learning process, where more English speech-oriented lesson materials and activities were introduced. Addressing the 'learning needs of the students, group activities were used within the classroom along with a mix of pair and individual activities as well. The nature of these students' needs, lacks, and wants were substantiated by the interview respondent as well. According to her perspective, mastery of all English language skills was important. However, she focused more on improving her English writing skills, which was essential both academically and professionally. Considering these notions, appropriate materials along with more writing-oriented activities like paragraph writing and essay writing were incorporated within the lessons. Thus, it is evident that NA is an effective way that can be used to understand the real needs of a learning community, where the perspectives of both students and other stakeholders are accounted for.

In this study, this concept was practically used within the classroom context to improve the lesson materials and the lesson delivery. Moreover, it suggests that NA could be used within the larger processes of curriculum design and material development at the institutional and national levels as well.

Keywords: *Needs Analysis, Curriculum Design, Material Development, James Dean Brown, DELT*

Potentiality of Sri Lanka to foster Digital Education

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Education is a significant factor that drives the economy of a country. It stimulates entrepreneurship in the minds of the youth and gradually helps to reduce poverty and inequality. In the context of globalization and the modern digital revolution, from the last decade onwards education system had been in the course of modification. Unfortunately, in Sri Lanka, it's been the contrary. With the COVID-19 outbreak and the sudden shift to Online learning, the vulnerability of the Sri Lankan education system was exposed to the dysfunctionality of the school system during the pandemic period. It had therefore raised the impending research question if Sri Lankan schools are prepared to face the challenges of digital learning. Even though it seems like education is given precedence of all under the concept of "free education "in Sri Lanka, it had undoubtedly ignored effecting digitalization in the educational sphere. Due to the benefits of digitalization, It is vital to groom students and teachers for the rapidly changing digital world but it seems to be overlooked utterly due to unawareness and inevitable reasons (i.e. socio-economic conditions). This study, therefore, aims to assess the obstacles faced by Sri Lankan students and teachers in digitalization and to explain the strengths and weaknesses of digital education while determining if Sri Lankan Schools are ready to implement it. This study adopts a Qualitative Research Methodology to analyze the research question given. An extensive analysis of primary sources; books, journal articles, conference proceedings, survey findings, and personal interviews focused on 20 teachers and 50 students of the central province as the sample and online resources as secondary sources have been conducted and the results of the questionnaire and personal interviews relating to this study has led to identifying the factors that need special attention in this process. In conclusion, this subject area must come to notice to teach the importance of digital education, its strengths and weaknesses of it, and the ways to mitigate weaknesses and further strengthen the strengths to modify the Sri Lankan educational sphere.

Keywords: *digitalization, education, Sri Lanka, strengths, weaknesses*

Teaching English as a Second Language through *Zoom*: The Perspective of English Language Teachers in Universities

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Until the outbreak of COVID-19, online teaching and learning were new to many Sri Lankans. Teachers and students both had to adapt to this new lifestyle within a very short period as there were no other options left out. The sudden change from face-to-face teaching to distance teaching caused numerous changes to the usual routine. Since teaching a language required a more practical approach rather than other subjects which are theory-based, teachers had to think differently to maintain their online classes without any interruptions. To carry out the teaching and learning process smoothly, various online teaching modes were introduced, and among them, *Zoom* became one of the popular channels for delivering lectures, especially in universities. However, the virtual classroom became a new experience for both teachers and students and as a result, many obstacles were faced. Hence, this research aims to find the challenges encountered when teaching English as a second language through *Zoom* with special reference to English Language teachers in a particular state university in Sri Lanka and to identify possible solutions to minimize the issues faced and thereby make recommendations. The methodology of this research study follows a mixed-method approach. The required data were gathered through an online questionnaire survey and semi-structured interviews conducted with the participation of English language teachers who belong to different faculties in this particular university. As the findings of the study reveal, initially the teachers came across technical issues which they could not solve alone as it was a new experience for them. This challenge was mostly mentioned by teachers who are not very young. Hence the generation gap emerged with technical issues. Most participants mentioned that they are not sure whether *Zoom* is the most suitable tool to conduct English language lectures at the university. The teachers were doubtful about this reason because most students do not prefer to turn on the camera saying that they face connection issues when they turn it on. Therefore, teachers find it difficult to observe the students. When the students refuse to provide answers during live lectures, the teachers say they feel like the students are not respecting them. Although preparing for a *Zoom* lesson takes a lot of time and effort, the features in *Zoom* such as screen sharing, and the breakout room option give the chance to present a successful lesson. The teachers said they will be more satisfied if they were made aware through seminars and

workshops about organizing English lessons via *Zoom.* However, the teachers prefer *Zoom* over other options such as *Skype* or *Google Meet,* etc. In conclusion, it could be stated that the equal contribution of both teachers and students is mandatory to carry on a successful *Zoom* lecture.

Keywords: English Language Teaching, University Teachers, *Zoom*

“The Influence of Teacher Professionalism on Effective Teaching” A case of Tamil language schools in Munthal Divisional Secretariat, South Division, Puttalam District

JF Jasra

Teachers are seen as key stakeholders in better social development. A teacher should be seen to bewell-trained and able to teach and guide students to produce better students. Thus, the teachers who go to teach in the school must receive training for teaching and become teachers with good professional skills. They should also be seen as interested in developing their skills overtime after receiving appointments, but a negative trend can be seen in the teachers. In this way, this research was carried out based on the Tamil medium Type-2 schools under the Mundal Divisional Secretariat of the South Division of Puttalam District, the research area, under the title "Influence of Teacher Professionalism on Effective Teaching". In this research, only the seniorsecondary division was considered within the definition. 4 research questions were created basedon 4 main objectives and to achieve the purpose of the research by answering them, 20 teachers who teach in grades 10 and 11 were selected through convenience sampling method, considering the Covid -19 period of the research and the risk period conditions. Based on the analysis of the primary data obtained from them through an online questionnaire called Google form, through quantitative and qualitative analysis techniques, various personal and organizationalfactors are found for teachers not developing their professional skills and because it was found thatlack of up-to-date professional skills of teachers has a negative influence on teaching performance, suggestions are also given. Therefore, by developing their professional skills, teachers can effectively teach and improve student teaching. The conclusion was also taken through this research. Therefore, it is my belief as a researcher that my research will be a basis for further studies and will help to conduct more studies on this topic.

Key Words: *Effective teaching, professionalism, influence, teacher, teacher training*

TRACK 04

INFORMATION AND COMMUNICATION TECHNOLOGY

A decision framework for identification of sensor abnormalities and performing value estimation of not-available sensors in building sub-systems

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Building Management Systems are considered one of the critical systems of a facility to provide a properly commissioned and operational environment which ultimately results in a working or living-friendly indoor environment that leads to efficient utilization of energy and resources. Proper maintenance is required to deliver optimum and more reliable services with a higher level of satisfaction in terms of availability and reduced downtime. The proposed project istargeting two areas identified in the industry and provides mechanisms using prevailing deep-learning libraries and platforms. The first one is Deep learning-based abnormal sensor reading detection. This is to be achieved considering the sensor dependencies and malfunctions to be identified relative to the independent sensor readings related to a particular dependent sensor. Thesecond one is the value estimation of non-available sensors using only a subset of physical sensorsfrom the same model having the same design. In this case, having the corresponding root equipment which is having the physical sensor connected is required. For the other subset of equipment without the corresponding physical sensor, it is possible to estimate the values using the defined correlations of commonly available physical sensor values. Not malfunctioning sensor readings are essential in making maintenance decisions for building equipment and systems to have the correct maintenance at the right time. Not having required corrective maintenance will lead to the faults existing for a long time until the next planned and preventive maintenance. Further, the proposed mechanism for sensor value estimation will lead to cost and manpower saving for the building owner as there won't be a requirement to install additional required sensorson all the equipment. Instead, it is possible to install the sensors on a few pieces of equipment anduse the proposed mechanism to estimate the readings considering the correlation to donorequipment of the same model and the same independent parameters. The experimental results on sensor abnormality detection have shown an accuracy level of around 80% and the result from theestimation of sensor values has shown 80% plus the level of considering the estimation gap less than two.

Keywords: *Sensor Abnormality Detection, Sensor Value Estimation, Deep Learning, Tensorflow,Keras, Sensor Dependency Matrix*

Accurate Sentiment Analysis via Text Pre-processing and High-Quality Feature Selection and Representation

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The extensive usage of the Internet and Web-based applications such as forums, wikis, blogs, news feeds, e-commerce sites, and email are contributing to the interchange of ideas and social viewpoints. This results in text data growing exponentially. The effective analysis of text-based social viewpoints and customer opinions exchange in digital media are used for better decision-making in numerous applications. Sentiment analysis is a technique to analyze the comments or reviews expressed in the form of text to determine the opinion polarity. Traditional sentiment analysis methods have encountered several challenges in applying pre-processing, feature selection, and representation in determining opinions when dealing with text data. Specifically, the unstructured nature of the text and associated noise in some text sources stand against sentiment analysis methods to extract quality features. Also, the accuracy of capturing syntactic, semantic, and contextualized information controls the quality of feature selection in sentiment classification. In this work, we explore these issues following the experimental research method. We propose to extract high-quality features by developing specific pre-processing techniques that depend on the nature of the text. The proposed techniques go beyond the standard preprocessing techniques for handling emojis, emoticons and chat words to improve the quality of sentiment analysis in social media text data. Also, we explore the capabilities of advanced feature selection and representation approaches to learn syntactic, semantic, and contextualized information in improving the accuracy of sentiment analysis. We utilize pre-trained feature embedding techniques such as Word2Vec and Glove which generate a single vector for a word and, BERT which uses transformer architecture with the self-attention concept to capture contextual representation. Empirical analysis shows that the proposed pre-processing techniques with Word2Vec and Glove improve the accuracy of sentiment analysis compared to the state-of-the-art methods on well-known IMDB movie review and SemEval tweet datasets. Also, the application of BERT embedding without special preprocessing techniques produces superior results than all the baselines due to its ability in capturing high-quality features through contextual embedding.

Keywords: *Sentiment Analysis, Pre-processing, Deep Learning, Attention Concept, Natural Language Processing*

Credit Card Approval Prediction by Using Machine Learning Techniques

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This research is focusing on the application of machine learning (ML) techniques to predict customer eligibility for a credit card to mitigate possible future credit risk which may affect the bank's financial stability and credit performance. A credit card is a credit facility given toa customer by banks and finance companies around the globe. The credit facility has a creditrisk for the banks and financial companies. The repayments are least assured, and it often ends up as a non-performing credit facility (NPL). To mitigate credit risk banks are assessingapplicants' creditworthiness and checking their eligibility before granting a credit facility. The decision is mostly based on traditional credit scoring models and creditworthiness will not always be accurate.

The project aims to help banking and financial institutions to identify and interact with creditworthy customers by using predictive models. During the literature review phase, we found that most researchers used classification algorithms such as Artificial Neural Networks (ANN) and Support Vector Mechanisms (SVM) for credit scoring models.
Therefore, we have used Artificial Neural Network (ANN) and Support Vector Mechanism (SVM) to develop models. The CRISP-DM (Cross-industry standard process for data mining)process is used as a systematic approach. The credit card-related data set has been taken from the publicly available kaggle.com data repository. Several data preparation activities were applied for the data set and activities are cleaning data, constructing data, handling missing values, integrating data, handling outliers, categorical to numerical encoding, feature selections, feature scaling, and handling imbalanced data. The data set has been divided into training and testing into a ratio of 80:20. Training data set is used to train the model and applied ML algorithms ANN and SVM. By using test data models were evaluated.

Under ANN model building we have tested the model using different sizes of batches, and low and high learning rates. Linear SVM and Nonlinear SVM are both models used to evaluate the best SVM method. Filter-based methods, correlation, and information gain

under statistical featureselection were applied. Model accuracy was tested using Mean Absolute Error, Confusion Matrix, and AreaUnder Curve (AUC) for training and test data.

We have evaluated three classifiers and observed that Nonlinear SVM performed better than ANN and linear SVM. Nonlinear SVM model Accuracy is 0.88, Precision is 0.88, Recall is 0.90 and AUC is 0.89. Accuracy, Precision, and Recall values are higher in Nonlinear SVM than ANN and Linear SVM. The recall rate is 0.90 means the model predicts positive class 90% correctly. Furthermore, realized that customer behavior might be differentfrom country to country, and the application of several real banking datasets not limited to customer demographic and socio-cultural but also other credit facility features including COVID-19 impact is an area of concern for researchers. Additionally, whether there is a relationship between nonlinearity in highly imbalanced class problems with SMORTE application is another area of concern for researchers.

An Analysis of Animation Principles in UI Animations

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Animations are very popular graphics in every visual field including movies and any other visualcontent. Because they are very interactive with the audience when compared to the ordinary visualsin media. Animations used in websites' UI are very effective because it helps to increase user interactivity and focus on functions in web applications. Also, it helps users to access the functions easily because most are visualizing. Animation's principles are considered fundamentals of animation. They are techniques of making animations to improve the quality of animations with more engaging and believable motions of animation productions. But there is a problem in checking whether those animating principles are applied in a given animation. This research is based on analyzing the accuracy of simple animations according to the standard 12 principles of animations. The technologies behind this are Artificial Intelligence (AI) for identifying the real-time object detection of the input video animation and Machine Learning for predicting the particular animation principle of it. This is done by a model which gets an animation as the input and identifies its single object movement and detects the unique factors of selected two animatingprinciples via artificial intelligence framework (OpenCV) and then analyzes the principles using amachine learning algorithm (Logistic Expression). The main outcome of this study is to make an algorithm to analyze an accurate animation according to the 12 animation principles. So, any beginner can determine whether the animation they created is according to the animating principles. This algorithm will indicate whether any single shape-based animation is according tothe "slow in and slow out" and "anticipation" principles. And it will help beginners or anyone whohasn't knowledge of making animations properly to apply great animations to any user interface.

Keywords: *Animations, Animation principles, Machine learning, Artificial Intelligence*

Performance Enhancement of Convolutional Neural Networks based on Preprocessing of Datasets

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Convolutional neural networks (CNNs) have recently outperformed earlier methods in a variety of computer vision challenges, including picture classification, object recognition, and object segmentation issues. Due to powerful GPUs, which enable us to stack deep layers and analyse multiple aspects from the visual input, the deep neural network model is now possible. Convolutional neural networks (CNN) have produced very good results on a range of image recognition problems. Even though CNNs have had remarkable success in experimental evaluations, there are still many problems that require more research. In this study, we suggested a technique based on preprocessing the training and testing sets to enhance the performance of a convolutional neural network. We trained three well-known CNNs, AlexNet, GoogleNet, and ResNet, using data from three different databases: Oliva & Torralba, ImageNetDogs, and Caltech 256. When the grid approach was employed with the Oliva & Torralba database, the best results were obtained to the 70/30 ratio for the training and test set. Two different types of tests were run: one with standardization, which reduces all database classes to those with the fewest photos, and another with the full database. According to the findings, standardizing a database reduces performance. Additionally, test 1 reveals that the recognition rate for the class in Caltech 256 with the most samples, Clutter, was lower while classes with fewer samples, such as the golden-gate-bridge, harpsichord, scorpion-101, sun ower-10, and top-hat, had higher success rates. Which supports the decreasing prejudice against the Clutter class. Test 1 improved 106 classes' success rates while decreasing 143 classes' success rates. This shows that using entire databases yields the highest performance outcomes.

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