



BOOK OF ABSTRACTS

UNIVERSITY OF VOCATIONAL TECHNOLOGY, SRI LANKA

8th INTERNATIONAL RESEARCH SYMPOSIUM 2024

"Vocational Technology Education for a Sustainable Greener Economy"



INTERNATIONAL RESEARCH SYMPOSIUM - 2024
(IRS 2024-UoVT)

**Vocational Technology Education for a
Sustainable Greener Economy**



**University of Vocational Technology
Sri Lanka**

December 2024

BOOK OF ABSTRACTS

International Research Symposium - 2024

IRS 2024 - UoVT

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ISSN 2602-8778: © University of Vocational Technology

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Mr. M.G. Dharmasiri	Director General (Covering) / Senior Assistant Registrar (Establishments and Administration)
Mr. R.D.P.I. Priyadarshana	System Administrator
Mr. T.C. Jayamuthuge	Producer

MESSAGE OF THE VICE CHANCELLOR



Welcome to the International Research Symposium 2023. We are delighted to have you here and look forward to an engaging and productive event.

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Sincerely,
Chairman's Name

MESSAGE OF THE KEYNOTE SPEAKER

Dear Participants,



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Sincerely,

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Chairman's Name

MESSAGE OF THE GUEST OF HONOUR



It is an honour to contribute to the University of Vocational Technology Symposium 2024 as a guest speaker on the theme, “Empowering Dreams: Unlocking Higher Education Research Pathways for Vocational Excellence.”

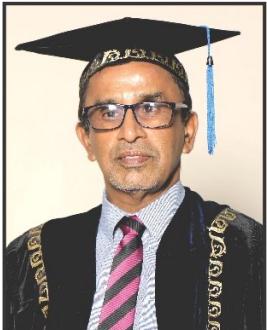
Vocational education is a cornerstone of any nation’s economy, workforce development, and educational progress. By bridging the gap between industry needs and academic expertise, it equips individuals with skills that drive innovation and growth. Since its inception, University of Vocational Technology has been a pioneer in this mission, nurturing talent and advancing vocational excellence in Sri Lanka.

Through its visionary free education system, Sri Lanka has the potential to achieve its aspirations by fostering research-driven solutions, enhancing global competitiveness, and shaping a resilient, skilled workforce. Let us continue to champion vocational education as a catalyst for national progress.

Thank you for the privilege of sharing in this important conversation. Together, we can unlock the potential of dreams.

Dr Nadeesha Chandrasena
Urban Innovator

MESSAGE OF THE DEAN, FACULTY OF EDUCATION



It is a great pleasure to issue this message on the occasion of the International Research Symposium (IRS), 2024 of the University of Vocational Technology. The Symposium is an annual event in the academic calendar of the University and has been a great success in the last several years.

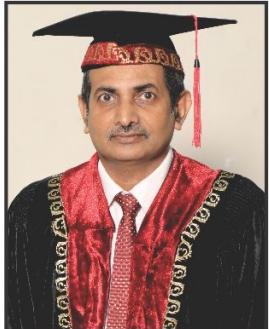
The University has continued to promote conducive environment for increased generation of quality research while enabling mentorship of early researchers through research methodology and data analysis capacity development. We believe that dissemination of knowledge and providing exposure to staff and students to engage in research is a part of our responsibility. It is a great opportunity for them to improve their analytical skills and interact with a wider community.

This annual symposium will provide an excellent platform for students and faculty members of the University, other public and private universities and research institutions to show-case their research productivity and promise for the future new knowledge generation.

Finally, I would like to thank the organizing committee and others who have worked hard to contribute to the success of this symposium.

Dr.Sunil Kularatne
Dean
Faculty of Education

MESSAGE OF THE DEAN, FACULTY OF ENGINEERING TECHNOLOGY



It is a great pleasure to have an opportunity to convey my best wishes to the 8th International Research Symposium (IRS-2024) of the University of Vocational Technology. I want to express how proud I am of the hard work you have all put into your research works. This event highlights the diversity of ideas and perspectives that enrich our community, allowing us to learn from one another and discover new approaches to the important challenges we face today.

This symposium is not just about presenting your work; it is also a fantastic opportunity to share ideas and engage in meaningful conversations. Connecting with fellow researchers and industry professionals can spark innovative ideas and lead to valuable collaborations. Remember, the insights you gain from each other can inspire new directions in your research and open doors to exciting possibilities.

As you present your research, keep in mind that the journey of discovery is just as important as the results. Embrace the spirit of exploration and creativity that drives your work. Consider how your findings can contribute to broader conversations in your field and make a positive impact in the community. I am excited to hear about the remarkable work you have accomplished and to see the engaging discussions that will take place throughout the symposium. Together, we can celebrate our achievements and inspire one another to reach even greater heights.

Dr. Jayalal Wettasinghe
Dean
Faculty of Engineering Technology

MESSAGE OF THE DEAN, FACULTY OF INFORMATION TECHNOLOGY

Dear Participants,



It is a great pleasure to send this message as the Dean of the Faculty of Information Technology for the International Research Symposium 2024 at the University of Vocational Technology on the theme “Vocational Technology Education for a Sustainable Greener Economy”

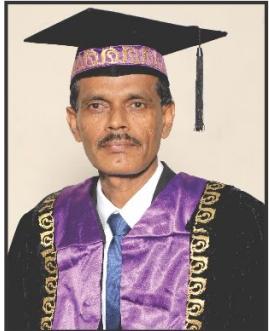
This event has become a significant occasion for the University, as the dissemination of knowledge is a fundamental responsibility of academics. I encourage our students to demonstrate dedication and commitment in publishing your academic work for achieving your professional goals. As we stand at the forefront of the technological revolution, I am filled with immense pride and anticipation for the challenging yet exciting event which leads the university to up-lift to a higher rank.

As we all know organizing this kind of event on annual basis is not an easy task. I wish to congratulate the organizers of the Symposium for their determined effort.

I firmly believe that this Symposium will bring a productive output in terms of academic and students research work. I express my special thanks to the symposium organizing committee, all participants and the presenters. Best wishes for a successful and inspiring symposium.

Ms. T.K. Malwatta
Dean
Faculty of Information Technology

MESSAGE OF THE DEAN, FACULTY OF INDUSTRIAL TECHNOLOGY



Greetings from the 2024 International Research Symposium, an exciting platform for innovation, learning, and collaboration. On behalf of the Faculty of Industrial Technology, it is my great honor to address all of you as we gather to explore groundbreaking research and insights across diverse fields. Our faculty consists of four dynamic departments: Film and Television Production Technology, Agriculture and Food Technology, Industrial Management, and Quantity Surveying. These departments drive our mission of nurturing future leaders equipped with the knowledge, skills, and entrepreneurial spirit to meet the evolving needs of industries worldwide.

We provide six Bachelor of Technology degree programs that are uniquely tailored to meet industry standards: Media and Arts Production Technology, Film and Television Production Technology, Food Process Technology, Industrial Management, Hotel Management, and Quantity Surveying. In order to ensure that our graduates not only succeed in their chosen disciplines but also possess the abilities to innovate, adapt, and lead in the rapidly evolving technological landscape, our academic programs place a strong emphasis on techno-entrepreneurship. At the Faculty of Industrial Technology, we are committed to fostering a research and innovation culture among our students and faculty members. This symposium reflects our ongoing efforts to promote academic excellence, encourage knowledge sharing, and inspire new solutions to the challenges facing industries today.

I urge everyone to think creatively and courageously as we have meaningful conversations and share ideas. Let's work together to influence industry, science, and technology in order to create a sustainable and prosperous future.

Dr. Kamal Edirisinghe
Dean
Faculty of Industrial Technology

MESSAGE OF THE SYMPOSIUM CHAIR

Dear Participants,



It is a great pleasure to send this message as the Dean of the Faculty of Information Technology for the International Research Symposium 2024 at the University of Vocational Technology on the theme “Vocational Technology Education for a Sustainable Greener Economy”

This event has become a significant occasion for the University, as the dissemination of knowledge is a fundamental responsibility of academics. I encourage our students to demonstrate dedication and commitment in publishing your academic work for achieving your professional goals. As we stand at the forefront of the technological revolution, I am filled with immense pride and anticipation for the challenging yet exciting event which leads the university to up-lift to a higher rank.

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Ms. P.M. Perera
Symposium Chair

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TECHNICAL SESSION 1

EDUCATIONAL STRATEGIES FOR SUSTAINABLE TVET

FACTORS AFFECTING TO THE SELECTION OF COURSES IN UNIVERSITY COLLEGES, SRI LANKA

W.A.M. Hansika

University College of Kuliyapitiya, University of Vocational Technology, Sri Lanka
Maduni_hansika@yahoo.com

Abstract: Concerning the variation in the number of applications received per year in the university college of Kuliyapitiya Sri Lanka, the researcher has undertaken the research with the main objective of investigating the factors affecting the selection of courses in University Colleges with special reference to the university college of Kuliyapitiya Sri Lanka. This research filled the contextual gap as well. With the proper understanding of the factors affecting course selection in university colleges, relevant authorities can facilitate better undertakings in increasing the number of applications which are of utmost importance in securing sustainable positions in the competitive industry. For the study, the researcher has adopted a phenomenological qualitative research design. The study population consisted of the students at the University College of Kuliyapitiya and the sample was drawn by adopting the Krejcie & Morgan (1970) table. The study found that, among various factors, personal interests, career prospects, parental and peer influence, availability of resources, course content and curriculum, prestige and reputation, and financial considerations can significantly influence course selection. This study will enhance the understanding of the general patterns of course selection in university colleges. It will provide strategic platforms to support the decision processes regarding the attractions of candidates. A few limitations of the study include geographical limitations and the limitation of only considering the University College of Kuliyapitiya for the study.

Keywords: Courses, Factors, Selection, University Colleges.

EFFECTIVENESS OF THE MIND MAPPING TECHNIQUE IN ESSAY WRITING: A CASE STUDY OF GRADE 11 ESL LEARNERS

S.G.M.D.S. Senavirathne¹, D.D.D. Suraweera²

¹Department of Language Studies, University of Vocational Technology, Sri Lanka

²Department of Electro-Mechanical Technology, University of Vocational Technology, Sri Lanka
elt20b161@uovt.ac.lk

Abstract: Essay writing is a challenging skill for Grade 11 ESL learners in Sri Lanka. The mind-mapping technique has been utilized to enhance essay writing skills in many countries. Hence, this experimental study examined the effectiveness of the mind-mapping technique compared to the traditional outlining technique in improving essay writing to address the difficulties these students face. Both Mind mapping and outlining techniques improved students' essay writing skills. However, students who used the mind-mapping technique performed better than those who used the outlining technique. The most significant improvement was seen in the organization of essays, attributed mostly to the use of the mind mapping technique, compared to content, language, and mechanics of writing. The findings highlighted the effectiveness of the mind-mapping technique in enhancing essay writing in general and organizing skill in specific. Based on the findings of this study it can be concluded that the mind-mapping technique has a positive impact on the essay writing skill. Hence, the mind-mapping technique is recommended to be incorporated into teaching and learning processes to enhance the essay writing of Grade 11 ESL learners.

Keywords: ESL Learners, Essay Writing, Mind Mapping, Outlining.

AN ANALYSIS OF PRONUNCIATION TEACHING INCLUSION INTO SRI LANKAN ENGLISH TEXTBOOKS FROM GRADE THREE TO G. C. E. (A/L)

R. M. Azver and A. A. Gunawardana

*Department of Language Studies, University of Vocational Technology, Sri Lanka
rafeela1982@gmail.com*

Abstract: Pronunciation inclusion plays a significant role in school textbooks, English pupils' books are designed for grades 3 to 11, and General English for (A/L), that are distributed as the sole primary resource by the government. Pronunciation is an essential skill to improve language competency. However, they often lack standardized activities and pronunciation teaching. Therefore, this study analyses the strengths and weaknesses of pronunciation activities in textbooks through own checklists based on the themes: explanation, materials, activities, evaluation, illustration, culture, varieties of English, and comprehensible input qualitatively. The textbook analysis is carried out for eight months in eight textbooks, excluding Grades 3 and G. C. E (A/L) textbook in which pronunciation is not emphasized, based on content analysis by identifying both primary and secondary textbooks carefully. Also, these activities are compared with the Teacher's Guide and internationally published books. These textbooks are embedded with some strengths and many weaknesses. Grade 3 and G.C.E. (A/L) textbooks are not embedded with pronunciation activities. Explanations are shallow and repetitive in primary grades whereas secondary grades do not consist the explanations and clues for teachers are inadequate and incorrect to some extent. Graphemes, mother tongue influences, homophones, homonyms, homographs, syllable-based reading, consonant clusters, representation of a certain letter to soft and hard sounds, intonation, and stress are neglected. In conclusion, the activities of textbooks are inadequate, inappropriate, and incorrect. Also, this study focuses on further inclusion for the future development of textbooks in terms of pronunciation and communicative skills by integrating technology in this changing world to focus on challenging areas, manipulate some strategies, and include more materials and supplementary materials.

Keywords: Analysis, Checklist, Pronunciation, Textbook activities, Themes.

NEEDS ANALYSIS OF ENGLISH FOR ACADEMIC PURPOSES FOR ELT UNDERGRADUATES

V.T.D.M. Kulathilaka and J. A. M. Buddhima Karunarathna

Department of Language Studies, University of Vocational Technology, Sri Lanka
elt20b236@uovt.ac.lk

Abstract: A needs analysis is one of the best tools to identify the EAP needs of tertiary level students. In the Sri Lankan context, there are significant drawbacks to EAP needs in writing among third year ELT undergraduates. Hence, the objectives of this study were to investigate the need of EAP in writing among third-year ELT undergraduates, to explore reflections of third-year ELT undergraduates in writing for EAP in the previous academic years and to explore the perspectives of academic staff regarding the EAP needs of the ELT undergraduates. The mixed research method was used based on purposive sampling in the research design. A questionnaire form of Google Form and focus group discussions were conducted with twenty-six third year B. Ed ELT undergraduates as well a structured interview with seven internal and external lecturers in the Department of Languages Studies was conducted to collect the required data. As for the results, it is identified that there is a need for EAP in writing among third year ELT undergraduates. Grammar, vocabulary, research skills and proofreading are the specified areas to be improved in EAP in writing among third year ELT undergraduates. Furthermore, the identified needs of third year ELT undergraduates are similar to their previous year's reflections which provide clear insight into their needs were not addressed properly in the third year. Moreover, the perspectives of lecturers significantly stated the deficiency of EAP in writing among undergraduates. In conclusion, initiating an EAP certificate course, inserting more written practices into the curriculum and self-practice are the recommendations made according to the findings of the study.

Keywords: Needs analysis, EAP, Academic writing.

A CASE STUDY OF ACADEMIC, SOCIAL AND FAMILY HISTORY AND BEHAVIOURAL SITUATION OF BELOW AVERAGE LEVEL STUDENT READERS WITH SPELLING AND WORD RECOGNITION CHALLENGES

S.S.S. De Silva

Department of English Language Studies, University of Vocational Technology, Sri Lanka
elt18b230@uovt.ac.lk

Abstract: Dyslexia is underrated due to teachers' ignorance, a lack of identification awareness, and educational resources in Sri Lanka. This study aims at identifying the academic, social, and family history and behavioral characteristics of student readers with spelling and word recognition at below average level. The objectives are to find out the academic, social, and family histories and behavioral characteristics. Additionally, three students were selected, and data was collected using two observational checklists with 25 and 50 key statements on a 5-point Likert scale. A first checklist with 25 statements was used to collect data from three students' primary and secondary teachers and five family members: parents, relatives. The three students were surveyed using a dyslexic screening test (DST) with 50 statements by an instructor of special learning education. The data was analyzed using descriptive analysis, and a descriptive mix method was used for identification and analysis. 57 characteristics were identified out of 75 (25+50) related to the characteristics: academic, social, family history, and behavioral, by two checklists. Findings were classified under four themes: Checklist 1 (25): 10 academics, 5 social, 5 family history, and 5 behavioral; checklist 2 (DST): 20 academics, 5 behavioral, 5 social and 2 family histories were identified.

Keywords: Characteristics, Spelling, Word recognition.

**ENHANCING LEARNERS' INTRINSIC INTEREST IN ENGLISH
LANGUAGE LEARNING THROUGH ORAL
ACKNOWLEDGEMENT: ACKNOLDEGING STUDENTS'
MINIMUM EFFORT FOR MAXIMUM IMPACT**

K.G.H.S. Chandrasekara and C.L Amarasekara

*Department of Language Studies, University of Vocational Technology, Sri Lanka
harshanicha48@gmail.com*

Abstract: The connection between the words and the human brain is intended to emphasize how miraculous the brain is. By acknowledging students orally, even for the minimum effort, may awaken their intrinsic interest (natural interest). This study investigates, how giving oral acknowledgment may enhance students' engagement and performance in learning the English language. The study used the mixed-method approach. For the first objective, the questionnaire was utilized and the data analyzed using MS excel and the analyzed data was categorized in to 5 themes: feeling discouraged, lack of self-efficacy, self -demotivation, lack of self - determination, lack of self - confidence. In the second objective, observational journals, and questionnaire were utilized. Three phases of student developmental patterns were identified by the researcher, based on the observational journal for the 15-day intervention period: Days 1–5, Days 6–10, and Days 11–15. These three phases involved the developing patterns of students' engagement level, enthusiasm and interest, gaining attention work quality, consistency with regular classroom dynamics. According to the observational journal, there was an overall 52% development in the above 3 phases. Additionally, the passive learners exhibit the greatest progress in the 3rd phase (days 11-15). Further, in the second objective, an interest scale was utilized, and the data was analyzed by the Wilcoxon Signed Rank Test, which resulted in 97.1% of respondents demonstrated a significant improvement. Cross-validation of the student's overall development was possible because both qualitative and quantitative data were used.

Keywords: Intrinsic interest, Natural interest ,Oral acknowledgement, Minimum effort

INDICES TO CONSIDER FOR FURTHER DEVELOPMENT OF DEGREE PROGRAMS: CASE STUDY-UNIVERSITY OF VOCATIONAL TECHNOLOGY, SRI LANKA

**U. Sivachelvy¹, S.R. Muditha Seneviratne², P. Uruthiran³ and N.B.W.I.
Udeshika⁴**

¹*Department of Industrial Management, University of Vocational Technology, Sri Lanka*

²*Department of Quantity Survey, University of Vocational Technology, Sri Lanka*

³*Department of Software Technology, University of Vocational Technology, Sri Lanka*

⁴*Administration Division, University of Vocational Technology, Sri Lanka*

sivachelvy@uovt.ac.lk

Abstract: The purpose of this research study is to reveal the training effectiveness (Dependent Variable) (DV) of sample degree programs of the University of Vocational Technology(UoVT), over the Trainee, Trainer, and Training Environment at institutional functioning criteria of Degree programs: Independent variables (IV). Thus, this research is anticipated to study the relationship and Impact of institutional functioning criteria of selected two sample degree programs as a model to propose factors to consider in developing related strategies for relevant improvements. The study was conducted using the quantitative approach. The Independent Variables (IV) therefore, in this study are as follows: Supportive Learning Environment (SLE), Support from the Working Social Working Environment: (SWSWE), University Training Environment (UTE), Class Room Facilities (CRF), Quality of Supporting Services Relevant to Lecture Delivery: (QSLD). The Training Effectiveness of the degree programs is considered as the Dependent Variable (DV). The SPSS data analysis software was used for the analysis purposes. Accordingly, as per the results, both the degree programs show a positive Correlation between the Independent and dependent variables, and related variables are proposed to be considered when developing the strategies for development. Yet, the Bachelor of Technology in Quantity Surveying Degree program shows a significant correlation between the IV's and DV. Considering the impact of IV's to DV it shows a positive impact for all the IV's to DV for both the degree programs, and recommended the consideration of relevant IV's for strategy development.

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Keywords: Degree Programs, Factors Affecting, Impact of institutional Function, Training Effectiveness.

CHALLENGES FACED BY STUDENTS IN LEARNING ENGLISH AS A SECOND LANGUAGE FOR G.C.E. O/L EXAMINATION IN PUTTALAM SOUTH EDUCATION DIVISION

W. R. A. D. Lakshani and K. T. P. C. Somarathna

Department of Language Studies, University of Vocational Technology, Sri Lanka
elt20b231@uovt.ac.lk

Abstract: English proficiency plays a pivotal role in shaping students' educational achievements and future career prospects. The purpose of this study is to investigate the challenges faced by students in learning English as a Second Language (ESL) for G.C.E.O/L in Puttalam South Education Division. The survey was conducted based on the data collected from six schools in Puttalam South Education Division where the fail rate of G.C.E.O/L examination is more than 60% continuously over five years. This study adopted the mixed method design using quantitative data collected from 265 students of Grades 9, 10, and 11 of selected six schools and qualitative data collected from 6 English teachers through in-depth interviews. The collected quantitative data were analyzed using descriptive statistical analysis and qualitative data were analyzed using thematic analysis. The findings of the research indicated that all the participants encountered linguistic challenges such as limited exposure to four language skills, vocabulary, and grammar while they faced socio-cultural challenges such as peer pressure and lack of support. Furthermore, as educational challenges, they encounter a lack of suitable learning environment, difficult to get attention and as motivational challenges, they face a lack of interest in learning due to less motivation provided by the families. Finally, psychological challenges fear, anxiety, and negative attitudes were identified as barriers that hinder the process of learning ESL. Additionally, the findings revealed that Linguistic factors, Cultural factors, Educational factors, Socio-economic factors, Technological factors, Psychological and Motivational factors affected the challenges. The findings of this study highlight that while English proficiency remains a significant challenge for students in the Puttalam South Education Division, targeted interventions and support systems have the potential to gradually improve their language skills and overall exam performance

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Keywords: Challenges, English as a Second Language (ESL), General Certificate of Education Ordinary Level (G.C.E.O/L)

THE ROLE OF POWERPOINT PRESENTATIONS IN ONLINE EDUCATION; A CASE STUDY BASED ON UNIVERSITY OF VOCATIONAL TECHNOLOGY, SRI LANKA

A. S. U. Dharmadasa¹ and K. D. S. S. Karunasinghe²

Department of Film and Television Production Technology, University of Vocational Technology, Sri Lanka.

*Kuli/Apaladeniya Maha Vidyalaya, Kuliyapitiya, Sri Lanka.
dharmadasasasu@gmail.com*

Abstract: Microsoft PowerPoint, Keynote and Prezi can be identified as most used applications to create presentations. These applications provide various kind of options which user can use to create appropriate presentations accordingly. Some options are unique to each application as well as some can be taken as common to every application. With current situation of pandemic, most of the online sessions were conducted with collaboration of presentations. So that researcher wanted to identify how these features/ options were helpful to undergraduates to learn and lecturers to teach. As undergraduates in information technology field, researcher thought that it would be better if can identify how these options are effective in learning and teaching. The aim is to evaluate the usage of PowerPoint features in lecture will increase the understanding of lectures by undergraduates and helps lecturers to teach the subject points clearly to the undergraduates. So, this study addresses to explore teaching experiences and to evaluate learning experience in using PowerPoint among undergraduates. The population of this research was around 300 undergraduates and lecturers of the University of Vocational Technology and the sample of this population was 30 undergraduates with 18 lecturers from the academic staff. The methodology is to conduct a survey using a questionnaire regarding the effectiveness of PowerPoint presentations in online education.

Keywords: Online teaching strategies, Pedagogical tools, Teaching effectiveness.

**ESL TEACHER COMPETENCE IN INTEGRATING
TECHNOLOGY WITH ESL INSTRUCTION: A COMPARATIVE
STUDY BETWEEN GOVERNMENT AND PRIVATE SECTOR IN-
SERVICE ESL STUDENT-TEACHERS**

R.T.V. Madushani and A.A. Gunawardana

Department of Language Studies, University of Vocational Technology, Sri Lanka
rtvmadushani@gmail.com

Abstract: The rapid development of technology has significantly introduced new capabilities across different fields, including education. It has left a remarkable mark on English language teaching, especially in English as a Second Language. In Sri Lanka, English being the second language, it is essential to integrate technology into the teaching practices to enhance the language learning. Yet, the technological competence of ESL teachers is questionable. Thus, this study focused on a comparative exploration of the technological competence of ESL teachers from government and private sectors in integrating technology with ESL instruction. This study utilized a quantitative approach and a case study design. The study sampled 30 in-service student-teachers following Bachelor of Education in English Language Teaching in a technological university in Sri Lanka. A questionnaire was used as the main data collection tool for the study. The findings indicate that they are competent in terms of basic computer and device operation skills, MS Office suite operation skills and internet and online resource utilization skills, while they are somewhat competent in digital tools and content creation skills. It is further revealed that private-sector ESL teachers are highly competent, while government-sector ESL teachers are competent in integrating technology with ESL instruction.

Keywords: ESL teachers, Technology integration, Technological competence.

PERCEPTIONS OF INSTRUCTORS ON THE USE OF EGP AND ESP IN TEACHING ENGLISH: A STUDY CARRIED OUT IN TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING INSTITUTION

V.S.Dileka Thennakoon and Dilini Ranasuriya

Department of Language Studies, University of Vocational Technology, Sri Lanka
elt20b123@uovt.ac.lk

Abstract: English Language Teaching (ELT) can be divided into two main branches such as English for General Purposes (EGP) and English for Specific Purposes (ESP). EGP is practiced to provide a solid foundation for the basic usage of the English language. ESP aims to equip learners with the language skills and knowledge necessary for specific disciplines or professionals. There is a modern trend of using ESP among ELT practitioners. This study aims to identify the perceptions of instructors on the use of EGP and ESP in Technical and Vocational Education and Training (TVET) institution. The researcher focused on National Vocational Qualification level five mechatronic course at Sri Lanka College of Technology, Colombo 10. In this study, qualitative method was used. Three instructors were the participants. The data was collected through interviews. It consisted of two main sections such as Part A and Part B. Part A was about instructors' profiles. Part B was about instructors' perceptions towards the use of EGP and ESP. The collected data was analyzed thematically. The findings of the study highlighted that EGP is the stepping stone for ESP and students need EGP and after that it would be better to develop that level into ESP. It also highlighted that ESP courses should be prepared to face real-life experience in the workplace, the need of trained young energetic ESP instructors with modern teaching strategies, and also the need of activity-based learning with especially speaking and writing skills. The need of a specialized and updated English language curriculum for mechatronic students is also a very important factor.

Keywords: English for General Purposes (EGP), English for Specific Purposes (ESP), TVET institution, instructors

SUSTAINABLE TVET: THE DESCRIPTIVE STUDY ON THE BARRIERS TO DEVELOPING THE ENGLISH LANGUAGE AMONG TVET SKILL LEARNERS

U.P.N.S.Gunathunga and Dilini Ranasuriya

Department of Language Studies, University of Vocational Technology, Sri Lanka
nilugunathunga@gmail.com

Abstract: The education provided by the TVET (Technical and Vocational Education and Training) sector in Sri Lanka does an excellent service to the country's economy and the development of a quality job market. TVET is established to serve quality education to the vocational sector to adhere to the current job market demands. Currently, the TVET has become the fulcrum of producing qualified candidates for the current world of work requirements hence the consideration of its sustainable development and growth is essential to create productive and proactive candidates for the technological world. Sri Lanka produces plenteous diploma/certificate holders mostly obtained NVQ 4 standards, in the vocational field per year from different TVET institutions. A considerable number of these educated field experts reach international companies. To work with foreign well-wishers and companies the qualified candidates must have a good command of English: if the knowledge of English is weaker the possibility of getting a job opportunity is deficient. Therefore, improving English expertise in the TVET sector is crucial to obtaining a quality education among vocational students. TVET graduates come from different backgrounds in the country and their basic diplomas and higher diplomas are being taught in their mother tongue and many face difficulties in following the higher education further as to become graduates. However, as diploma holders, the vocationally trained students must be proficient in English to abstain from giving up their career goals and acquiring higher educational qualifications. This study attempts to determine the obstacles that skill learners of the TVET sector must overcome to establish a sustainable TVET.

Keywords: Education, English, TVET

USAGE OF ICT TOOLS IN THE TEACHING AND LEARNING PROCESS IN THE TECHNICAL AND VOCATIONAL SECTOR: TECHNOLOGY ACCEPTANCE MODEL (TAM) APPROACH

Mahalingam Ramanan

University College of Jaffna, University of Vocational Technology, Sri Lanka
mmramanan@yahoo.com

Abstract: Information and Communication Technology (ICT) in the digital age plays a vital role in the educational sector worldwide. Many ICT tools greatly contribute to various activities in the educational sector. However, the question remains whether teachers accept or reject ICT integration in the teaching and learning process. This study aims to examine the teachers' attitudes toward the use of ICT in the teaching and learning process. This study used a modified Technology Acceptance Model (TAM) to explore the relationship between teacher attitudes towards the use of ICT and the actual use of ICT. This model consists of four core constructs and seven external variables. The volunteer sampling method was adopted to choose the participants. The data collection was done through the distribution of online and printed questionnaires. Questionnaires were distributed among the teachers from five institutions. Data analysis was conducted using SPSS version 25. The study indicates that four out of seven external variables were supported by the model. The study shows that Job Relevance (JR) had a greater effect on the attitude towards use (ATU) than on Perceived Ease of Use (PEOU) and perceived usefulness (PU). Further, the study revealed that teachers' attitudes towards the use of ICT had a positive and significant influence on actual ICT use. The study found that teachers' attitudes and relevant jobs played a major role in the usage of ICT in technical and vocational education contexts.

Keywords: ICT, Job relevance, TAM

**EXPLORING THE INFLUENCE OF GENDER IN THE ADOPTION
OF DIGITAL PLATFORMS FOR ENTREPRENEURSHIP: A STUDY
AMONG HIGHER NATIONAL DIPLOMA STUDENTS IN
COLOMBO, SRI LANKA**

H.A. Seneviratne

Department of Multimedia and Web Technology, University of Vocational Technology, Sri Lanka
helawikum@uovt.ac.lk

Abstract: The adoption of digital platforms has become a critical driver of entrepreneurial success, in rapidly evolving digital landscape especially among younger generations. This study explores gender-specific dynamics in the adoption of digital platforms for entrepreneurship among Higher National Diploma (HND) students in Colombo, Sri Lanka. Using the Technology Acceptance Model (TAM) as the theoretical framework, the study examines the role of Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Perceived Risk (PR), and Digital Literacy (DL) in influencing students' intentions to adopt digital platforms. A cross-sectional survey of 70 students selected via convenient sampling, comprising 42 males and 28 females, revealed significant correlations between key constructs and adoption intentions. While no statistically significant gender differences were observed in PU, PEOU, PR, or DL, males demonstrated a stronger overall intention to adopt digital platforms, reflecting higher confidence in their utility and ease of use. The study identifies digital literacy as a crucial enabler, with a strong positive correlation to adoption intentions ($r = 0.65, p < 0.01$). Conversely, perceived risks such as concerns about data security and financial loss negatively influenced adoption intentions ($r = -0.40, p < 0.01$). These findings underscore the need for targeted interventions to address gender-specific concerns, particularly for female students who perceive higher risks. Further, the study findings aim to foster equitable digital engagement and entrepreneurial success, contributing to Sri Lanka's digital economy growth.

Keywords: Digital Platforms, Entrepreneurship, Higher National Diploma (HND) Students, Sri Lanka, Gender, Technology Adoption.

ENHANCEMENT OF CAREER GUIDANCE FOR VOCATIONAL TRAINING RECIPIENTS OF VOCATIONAL TRAINING AUTHORITY OF SRI LANKA

Yamuna Manathunge¹, Prasanna Illankoon² and E. A. D. Senarathne³

¹*Department of Education and Training, University of Vocational Technology, Sri Lanka*

²*Department of Management of Technology, University of Moratuwa, Sri Lanka*

³*Career Guidance Division, Vocational Training Authority of Sri Lanka, Sri Lanka*

yamuna@uovt.ac.lk

Abstract. This research evaluates the career guidance services provided by the Vocational Training Authority of Sri Lanka for vocational training recipients. The research uses a survey methodology to assess satisfaction levels and perceived benefits. The study aims to identify areas for improvement and formulate practical recommendations to improve the quality of career guidance services. Representative sample was selected from instructors and trainees, both current and past. A sample comprises of 83 administrators and 66 trainees replied to a multiple-choice questionnaire. The results were analyzed using Microsoft Excel. The results show that there is a serious need for engaging students early in their VTASL experience, with a preference for support throughout their training journey as well as the urgent need for the career guidance infrastructure enhancement. Respondents also prefer a friendly approach and creating an attractive environment that may foster positive attitude toward career guidance. The findings are valuable for policymakers, educators, and career guidance officers in vocational education, enabling informed decisions about the refinement and development of career guidance services. The research serves as a foundation for further research and advancements in career guidance within vocational education settings.

Keywords: Career guidance, Vocational education, Career guidance officers, Vocational Training Authority

**GAMIFICATION AS AN INNOVATIVE TEACHING
METHODOLOGY TO ENGAGE AND MOTIVATE LEARNERS FOR
SUSTAINABLE TECHNICAL AND VOCATIONAL EDUCATION
AND TRAINING**

Janaka Jayalath

*Department of Multimedia and Web Technology, University of Vocational Technology, Sri Lanka
janaka@uovt.ac.lk*

Abstract: The use of game dynamics into Technical and Vocational Education and Training (TVET) delivery has started as an innovative step to improve learner engagement and motivation. This paper reiterates the potential of gamification as a teaching-learning method within TVET, highlighting its role in crafting a sustainable learning environment. After a comprehensive review of existing literature, this paper observes the theoretical background of gamification, its applications in TVET delivery, and the challenges and opportunities it provides. The potential of gamification to improve learning outcomes, enhancing competencies, and contribute to the long-term sustainability of TVET programs could be reflected as outcomes.

Keywords: Game Dynamics, Gamification, Motivation, Teaching Methodology, Sustainable TVET.

EXPLORING LECTURERS' PERCEPTIONS ON MOBILE ASSISTED LANGUAGE LEARNING IN ESL CLASSROOMS: A CASE STUDY

K. G. I. Madumalika and K. T. P. C. Somarathna

*Department of Language Studies, University of Vocational Technology, Sri Lanka
elt20b240@uovt.ac.lk*

Abstract: Mobile Assisted Language Learning (MALL) refers to the use of mobile devices to facilitate language learning, a method gaining popularity globally. However, integration in MALL in English as Second Language (ESL) classrooms seems to be limited, despite widespread use of technology and devices among undergraduates and lecturers. Therefore, the research is focused on exploring lecturer's perceptions on MALL in ESL classroom aiming two objectives as to identify the mobile applications used by lecturers in ESL classrooms at University of Vocational Technology (UoVT) and to investigate the perceptions of lecturers on MALL in ESL classrooms at UoVT. The research was conducted as a case study, using qualitative and quantitative data collected through structured interviews and self-administered questionnaire occupying six internal and visiting lecturers attached to the Department of Language Studies (DLS), Faculty of Education (FE), UoVT, who teach Communication Skills I and II modules for first-year students. The collected qualitative data was analyzed using thematic analysis while quantitative data analyzed through descriptive statistical analysis. The analyzed data clearly expressed that Google Classroom, YouTube, WhatsApp, Grammarly and Zoom are different mobile applications used by the lecturers in teaching Communication Skills I and II modules for first-year undergraduates. As followed by the second objective, the diverse perceptions towards MALL such as support for improving language skills, convenience of using MALL and facilitation of MALL were identified. Even though 66.67% of lecturers acknowledged its potentiality in motivating students' others expressed doubts on the relevance and efficacy of mobile applications in teaching. These findings contribute to the broader discourse on MALL by offering practical insights into its implementation in higher education and suggesting the need for tailored strategies to better integrate mobile learning into ESL instruction.

Keywords: Mobile Assisted Language Learning (MALL), English as a Second Language (ESL), Lecturer perceptions

TECHNICAL SESSION 2

ENGINEERING TECHNOLOGY FOR GREEN ECONOMY

A CASE STUDY ON COST-BENEFIT ANALYSIS TO ASSESS THE PROFITABILITY OF INSTALLING SOLAR PANELS AT THE IRRIGATION DEPARTMENT HEAD OFFICE IN COLOMBO

S. S. Yamasinghe and U. Sivachelvy

Department of Industrial Management, University of Vocational Technology, Sri Lanka
sivachelvy@uovt.ac.lk

Abstract: This paper presents a cost-benefit analysis of installing solar panels at the irrigation department head office in Sri Lanka. The objective is to reduce the electricity costs, which currently amount to approximately 2.3 million monthly. The analysis includes a comprehensive assessment of the Net Present Value (NPV) of 108,006,371.67, Internal Rate of Return (IRR) of 38%, Payback Period of 2.57 years, and Return on Investment (ROI) of 38.06%. Results indicate that the solar panel installation would not only achieve substantial cost savings but also contribute to sustainability efforts by reducing carbon emissions. The study concludes with a recommendation to proceed with the installation based on the positive financial and environmental outcomes. This project demonstrates a sustainable approach to energy management and cost reduction.

Keywords: Cost Benefit Analysis, Internal Rate of Return, Net Present Value, Return on Investment, Solar Panel.

FACTORS INFLUENCING INTENTION TO PURCHASE RESIDENTIAL SOLAR PANEL SYSTEMS IN SRI LANKA

G. Thilak Kumar¹ and Indika P. Kaluarachchige²

¹Sri Lanka Institute of Marketing, Sri Lanka

²University College of Matara, University of Vocational Technology, Sri Lanka

thilakshan69@gmail.com

Abstract: This research explores the determinants of residential solar panel adoption intentions in Sri Lanka's urban settings, focusing specifically on Colombo. Employing a quantitative research design, the study evaluates how product knowledge, perceived benefits, cost considerations, and social influence shape purchasing decisions. Data were gathered from 291 participants using a structured survey and analyzed via correlation and regression methods. The analysis highlights that perceived costs and social influence play significant roles in shaping purchase intentions, whereas product knowledge and perceived benefits do not exhibit substantial impacts. The findings explain a significant portion of the variability in purchase intentions, underlining the importance of cost-related perceptions and the role of social influence as critical factors. These insights are crucial for developing effective marketing strategies in the renewable energy sector, offering guidance for addressing cost concerns and utilizing social dynamics to promote solar energy adoption. The study advances the understanding of consumer behavior in sustainable energy solutions within urban Sri Lanka, providing actionable recommendations for solar energy providers, policymakers, and researchers.

Keywords: Solar Panel Systems, Purchase Intention

DESIGN AND IMPLEMENTATION OF A POWER MONITORING SYSTEM FOR INDUSTRIAL APPLICATIONS

R.A.A.N.Yapa and H.M.S.M.Herath

Department of Electrotechnology, Faculty of Technology, Wayamba University of Sri Lanka.
anyapa253@gmail.com

Abstract This research project introduces the development of an effective user-friendly power monitoring system for a leading bottling company located in the Western Province area. The aim of this project monitor the power quality of the power system in real time and to get accurate energy consumption value to calculate KPI values of the company. The system monitors the electrical system in real-time using a powerful energy analyser which is capable of measuring many parameters related to electricity. Power monitoring systems are used widely in industrial plants and buildings to analyze power consumption. For industrial plants, it is essential to measure changes of three-phase voltages, current demand, power factor, harmonic distortion, frequency, and power consumption to monitor power quality. Manual data logging is not an effective and accurate method. To solve this issue, a low-cost suitable power monitoring system was developed for the selected company. For the data collection, seven power analysers were installed in the main panel room. These power analysers are installed on two incoming bus bars and five outgoing bus bars. The real-time data measured by the power quality analyser is transferred to the programmable logic controller's (PLC) Modbus Gateway. The Modbus Gateway transfers data to PLC, which then transfers data to a local database which is established in the office via Ethernet. The developed centralized supervisory control and data acquisition (SCADA) can log all this data second by second in its database. Finally, one of the KPI values for Power Consumption per Bottle Case for the company was obtained and energy-saving opportunities were identified through this system. Using the database, power system-related issues were analysed and identified according to industry standards and suggested solutions to mitigate them.

Keywords: Power monitoring, Power quality, PLC programming

ASSESSING THE FEASIBILITY AND POTENTIAL OF VERTICAL AXIS WIND TURBINES (VAWTs) AS A SUSTAINABLE ENERGY SOURCE FOR REMOTE UNIVERSITY SETTINGS

R A T I Ranasinghe, D M Warakagoda and D M P N K Dissanayake

University College of Kuliyapitiya, University of Vocational Technology, Sri Lanka
dmnpscfinale@gmail.com

Abstract: The global energy landscape is undergoing a transformative shift, driven by the imperative to reduce greenhouse gas emissions and mitigate the impacts of climate change. Vertical axis wind turbines (VAWTs) present a promising alternative for electricity generation due to their distinct advantages over traditional horizontal axis turbines. This paper reviews the current state of vertical wind turbine technology and explores its potential for enhancing re-newable energy production at institutional level in remote settings of Sri Lanka. In the context of Sri Lanka and institutional built environment, the unique design characteristics of VAWTs, such as their ability to operate in turbulent wind conditions and their lower noise profile compared to horizontal axis turbines, are discussed. As the case study, University College of Kuliyapitiya is considered where the practicality of lighting up college streets with lamps are experimented with a model of Vertical axis wind turbine to measure the potential of using a real life model and its efficiency on the matter. The paper also examines recent advancements in VAWT efficiency and performance that contribute to improved energy capture. By evaluating technological, contextual and social factors, this paper aims to provide a comprehensive overview of vertical wind turbine technology and its role in advancing sustainable energy solutions.

Keywords: Vertical Axis Wind Turbine, Renewable energy, Institutional built environment

DESIGN OF AUTOMATED OIL-WATER SEPARATOR SYSTEMS TO REDUCE ENVIRONMENTAL EFFECTS IN ASSOCIATED INDUSTRIES

H.I. Pushpakumara and Sasiri Gamage

*Department of Electro-Mechanical Technology
University, University of Vocational Technology, Sri Lanka
ipkumarcpstl@gmail.com*

Abstract: This paper overview the important of advance oil water separator technology in managing oil contaminated water in industry like Petroleum, Manufacturing and Transporta-tion. This paper give details to existing systems and their limitations and highlighting the needs for more efficient solu-tions. The study introduces novel approach by involving au-tomaton systems to improve performance of oil water separators. This method improve accuracy, minimize manual operations, reduce interceptor overloading, solid waste collecting. API Separator that are optimize for parameters like length to width ratio, depth to width ratio and horizontal velocity. The study promotes combining for integrating full automated systems with conventional separation technology to enhance operational performance reliability and environmental protection.

Keywords: Oil-Water Separator, System Automation, Environmental protection, efficient

SUGA RCANE BAGASSE ASH AS A PARTIAL SUBSTITUTE FOR FINE AGGREGATE IN CEMENT-BASED PRODUCTS

T. M. S. Madhushika, K. G. Alahapperuma and D. D. D. Suraweera

*Department of Electromechanical Technology, University of Vocational Technology, Sri Lanka
kgalahapperuma@uovt.ac.lk*

Abstract: Sugarcane Bagasse Ash (SCBA) is one of the most common types of agricultural waste, and it is obtained as a byproduct of the combustion of sugar industries. The disposal of large quantities of this waste is a critical concern in the sugar industry. Due to its availability and pozzolanic properties, it can be utilized as a partial replacement for cement or sand in concrete products. The impact of incorporating SCBA as a partial substitute for sand up to 50% by volume in interlock cement bricks was technically investigated in this study. The properties of visual appearance, density, water absorption, and compressive strength were tested after seven days of production of the bricks. A slump test was conducted for every brick mix to observe the workability. As per the results of all samples, the bricks with 10% SCBA addition were selected as the most preferable bricks. The average compressive strength of the selected bricks was observed to be 13.54 Nmm⁻². The selected interlock bricks can be recommended to be applied in indoor gardens and house pavements where heavy loads aren't used.

Keywords: Cement Interlock Bricks, Compressive Strength, Substitute, Sugarcane Bagasse Ash, Waste Material

08th International Symposium of University of Vocational Technology 2024



Rathmalana, Sri Lanka | 12th. December 2024

A REVIEW ON CHASSIS SYSTEMS OF TRICYCLES

**D.A.T.Deshan, H.D.D.M.S.S.Namal, M.T.Dhanushka, H.N.W. Gunasekara,
and S.V.R. Gamage**

*Department of Electro-Mechanical Technology, University of Vocational Technology, Sri Lanka
hasith.gunasekara@uovt.ac.lk*

Abstract: This review paper examines the current advancement in the design and enhancement of tricycle chassis, focusing on innovations and design approaches that enhance the performance, safety, and functionality of tricycles. This paper explores various design principles, materials, and engineering techniques employed in the construction of tricycle chassis. Key topics include structural analysis, durability, load distribution, stability improvements, rider's comfort and the integration of modern technologies such as lightweight materials. Additionally, the review highlights recent research findings and trends that address the challenges faced in optimizing tricycle chassis for different applications, from commercial use to recreational and mobility aids. By synthesizing current knowledge and identifying gaps in existing research, this paper aims to provide a comprehensive understanding of tricycle chassis design, offering insights for future research and development in this field.

Keywords: Tricycle, Tadpole, Delta, Chassis, Stability

INVESTIGATION OF BURNED TIMBER ASH AS A PARTIAL SUBSTITUTE OF CEMENT IN SOIL-CEMENT MIX AS A BACKFILLING MATERIAL IN SMALL-SCALE BUILDING CONSTRUCTION

S. S. K. Lankeshwara and Shankani Gunarathna

Department of Construction Technology, University of Vocational Technology, Sri Lanka
shankanigunaratna@yahoo.com

Abstract: Backfilling is a critical process which is to be done after the construction of the substructure. The backfilling can be done using the same soil that has been excavated. However, if the soil lacks the bearing capacity or shear strength, then soil stabilization can be done. Soil stabilization is mainly done using cement or using lime. However, the incorporation of cement in stabilization is not a very sustainable process. Much research is being done to determine the suitable material to partially replace the cement. Among the research materials, wood ash is a priority. Cinnamon ash is commonly found in the Galle district, hence, this research is focused on determining the optimum mix ratio, when cement is partially replaced with cinnamon ash. It was found that mixing cinnamon ash decreases the compressive strength of the stabilized soil. However, when the ratio of Water: OPC: Cinnamon Wood ash: Soil is maintained at 2.5: 0.8: 0.2: 8.5 respectively, the strength decrement is only 0.4 N/mm². Hence, the optimum ratio is selected as the above ratio. Further, approximately Rs. 1000.00 can be saved from 1 m³ which is a saving of 4.8% when the optimum mix is used instead of the conventional mix. Therefore, cinnamon ash can be recommended as a sustainable material to be used in partial replacement of cement in backfilling provided that the strength gained is within the required range.

Keywords: Backfilling, Partial replacement, Wood ash..

**A COMPREHENSIVE INVESTIGATION INTO THE
APPLICATIONS, BARRIERS AND FUTURE DIRECTIONS OF
DRONE TECHNOLOGY IN SRI LANKAN CONSTRUCTION
MANAGEMENT**

K. Vaitheki

British College of Applied Studies, School of Construction and Built Environment, Sri Lanka
vaitheki22@gmail.com

Abstract: Technology breakthroughs have led to notable developments in the building sector, which is a pillar of societal growth. Drone technology stands out among these because it has the ability to completely transform construction management by improving accuracy, safety, and efficiency. The aim of the research study is to examine the usage of drone technology in Sri Lanka's construction industry, emphasizing its current applications, challenges, and potential future developments. A quantitative research approach was utilized to this research study. Project managers, engineers, and quantity surveyors were among the 65 construction professionals who took part in a thorough questionnaire survey; 50 of them responded. Descriptive statistical techniques were employed to analyze the data, utilizing MS Excel and SPSS software tools. The research provides insights into the current status and future prospects of drone technology in construction, focusing on the Sri Lankan context. The research study utilized a convenient sampling method. The results indicate that drones are being utilized more frequently for accurate land surveys, rapidly generate comprehensive topographic maps, and produce visual progress documentation to mitigate potential conflicts between contractors and property owners. The primary obstacles cited for drone implementation in the construction sector are substantial initial expenditures for drones and accessories, high maintenance and operational expenses (including licensing and registration), and the necessity for operator clearance from regulatory authorities. The subsequent points were recognized as future implications of drone technology in the construction sector: Technological advancements will enhance the integration of drones with block chain, 5G, and artificial intelligence. Integrating drones with BIM systems facilitates real-time updates for enhanced precision and coordination. Advanced sensors and artificial intelligence will enable drones to identify hazards, thereby improving worker safety. Although the research is geographically confined to the northern and western portions of Sri

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Lanka, its findings provide significant implications for other developing nations considering the implementation of drone technology in building.

Keywords: Drone Technology, Construction Industry, Unmanned Aerial Vehicles.

DETERMINATION OF APPLICABILITY CLAY FROM THE ABANDONED TILE FACTORY YATIYANA, MATARA, SRI LANKA FOR A WALL TILE DESIGN

D.S. Abeygunawardana and T.D. Denagama

Department of Construction Technology, University of Vocational Technology, Sri Lanka
tdenagama@yahoo.com

Abstract: Many clay tile factories face abundance and underutilization due to newer alternatives. However, sustainable wall tile alternatives are regenerating these factories by repurposing their materials and revitalizing production lines. This approach not only revitalizes the factories but also addresses environmental concerns by promoting natural materials. By utilizing abundant clay resources, these factories can meet the rising demand for eco-friendly building materials, preserving traditional craftsmanship and supporting sustainable urban development efforts. This rebirth signifies a blend of innovation and tradition, fostering a more sustainable future for construction practices. This is an attempt to search for alternative eco-friendly wall tiles for decorative purposes with clay's strength and artistic properties. Five approaches were made to change the mix design of cement and clay percentage. The cement content started at 2.5% and increased by 2.5% for each mixture, while the clay percentages were adjusted accordingly relative to the cement content. This differs from traditional clay tiles as it does not undergo any firing process; instead, the method involves compacting the materials. The standard tests were done to identify the optimum most practical mixture. The results obtained revealed that the optimum mixture of the proposed decorative wall tile can be produced by using clay 87.5% with cement 12.5% by weight together

Keywords: Repurposing, Alternatives, Clay, Compacting, Mix design

A COMPREHENSIVE ANALYSIS OF THE ROLE OF DIGITAL TWIN TECHNOLOGY IN THE CONSTRUCTION INDUSTRY

K. Vaitheki and J. Dhanuj

British College of Applied Studies, School of Construction and Built Environment, Sri Lanka
vaitheki22@gmail.com

Abstract: The primary aim of this research study is to explore the application of digital twin technology within the construction industry. The objectives of the study were described as follows; to investigate the application of digital twin in construction industry, evaluate the concept of digital twin in construction industry, assess the challenges to implement digital twin in construction industry and explore the strategies to overcome the barriers of digital twin in construction industry. To achieve these objectives, the research relied on comprehensive literature findings that were gathered through an extensive review of journal articles, books, websites, and other pertinent sources. The research study was utilized a qualitative approach, ensuring a thorough examination and synthesis of existing knowledge. The study's key findings revealed that the concept of a digital twin was first proposed by NASA's Apollo 13 mission, which was intended to solve spacecraft difficulties. From simple CAD systems to complex, real-time 3D-powered models that combine many data sources for improved visualization and decision-making, DT has advanced over time. When it comes to the application of digital twins in construction, DT technology makes it possible for perfect synchronization, bi-directional coordination, and real-time updates between digital and physical assets. Lack of understanding, high implementation costs, and reluctance to embrace cutting-edge technologies are major obstacles to the adoption of digital twins. The primary strategies for digital twin technology are Construction projects may be operated and maintained more efficiently if DT is used early on. Furthermore, the validity of the research findings is reinforced by validation from industry experts, who provide critical feedback and ensure the relevance and applicability of the results in real-world construction scenarios.

Keywords: Digital Twin Technology, Construction Industry, AI Technologies.

CASE STUDIES OF SOFT ACTIVE MATERIALS FOR ENGINEERING APPLICATIONS

MML Pemachandra¹, AP Rathnayaka², and YRDR Senanayaka³

¹Department of Civil & Environmental Engineering, University of Ruhuna, Sri Lanka

²National Water Supply & Drainage Board, Sri Lanka

³State Engineering Corporation, Sri Lanka

lahiru.p@cee.ruh.ac.lk

Abstract: This research investigates the potential of soft active materials (SAMs) as transformative elements across diverse engineering domains. Focusing on four key applications—overhead bridges, sustainable dancing floors, hybrid systems, and camera lenses—the study explores the practical implementation of SAMs to address contemporary challenges. In this study, engineering applications are explained using existing theories of soft active materials and material science with analyzing newly developed finite element models. Piezoelectric elements were integrated into an overhead bridge model to assess their potential for structural health monitoring and energy generation. With use of PZT-4 material, 0.12 millivolts were induced, under applied forces and specific boundary conditions. Sustainable dancing floors were conceptualized to harness energy from human movement through piezoelectric material integration. With typical reasonable assumptions, the estimated energy generation was 126 KJs. In the realm of hybrid systems, regenerative braking systems incorporating dielectric elastomers were modeled to enhance energy efficiency. With the use of a brake shoe comprising 1000 layers of polyisoprene dielectric elastomer, under an average braking force, per braking cycle 48 millijoules of electrical energy could be generated. The study also explored the application of SAMs in camera lens technology, aiming to develop compact, high-performance lenses through tunable refractive index materials. These case studies collectively demonstrate the versatility and potential of SAMs in addressing complex engineering problems. In conclusion, this study finds that soft active materials such as piezoelectric elements, dielectric elastomers, etc., can be used as sustainable materials which can generate a significant impact on innovation and technological advancement which helps to improve sustainable practices creating a new path to sustainable green economy in the world as well as in Sri Lanka.

Keywords: Energy harvesting, Piezoelectrics, Soft active materials.

MINIMIZING VARIATION ORDERS IN THE CONSTRUCTION OF MARRIED QUARTERS FOR SPECIAL TASK FORCE, SRI LANKA: A CASE STUDY

E.S.N Nadeeshani

Department of Quantity Surveying, University of Vocational Technology, Sri Lanka
qs20b202@uovt.ac.lk

Abstract: One of the problems often experienced in the construction sector is variation orders. Variation orders affect project implementation efficiency since they often cause a considerable cost increase as well as delays. Since the project of construction of married quarters for the Special Task Force, the building is essential hence efficient project management is needed for timely completion. Therefore, the study will focus on determining the factors causing variation orders in the construction of married quarters for the STF in Sri Lanka. The study will help determine what factors result in variation orders and how the orders can be curbed to avoid delays through implementation strategies. In this study, I will adopt a case study method to investigate a sample of STF married quarters construction projects. Primary data will consequently be gathered through semi-structured interviews with key stakeholders, such as project managers, consultants, and construction contractors. Further, project document and record reviews will be conducted. The analysis will involve identifying patterns and trends in variation orders and evaluating their impact on project performance, as well as investigating what brings about them. Once completed, this study will use its findings to prepare a list of suggestions to minimize variation orders. This would significantly streamline the construction process and facilitate more cost-effective and timely project delivery to all participants involved.

Keywords: Construction, Building projects, Variations, Variation Causes

ASSESSING THE IMPACT OF UTILITY CUTS PRACTICES ON THE SERVICE LIFE OF FLEXIBLE PAVEMENT IN SRI LANKA

J.M.I.S. Jayasundara, W.R.N.S. Senavirathna and T.D. Denagama

*Department of Construction Technology, University of Vocational Technology, Sri Lanka
isubhashini98@gmail.com*

Abstract: Road networks of Sri Lanka frequently have post-utility installation. In order to put these services underground, several utility companies, including NWSDB, partially or completely destroy the road pavement. It is a common situation that numerous defects are created after the pavement is reconstructed. The study investigates the impact of utility cut practices on the service life of flexible pavements in Sri Lanka. Using a mixed-methods approach, it identifies the most prevalent types of pavement defects associated with utility cuts and the contributing factors. The study reveals that poor joint construction, poor compaction, and improper backfilling are the main primary causes of road defects according to the RII value of 0.813, leading to the most significantly uneven surfaces according to 0.873 RII, secondly, bumps have shown a 0.851 RII value, and thirdly, surface cracking has a value of 0.848. Utility cuts are found to have a significant impact on traffic flow, road safety, and the economy due to safety hazards and general inconvenience. The research emphasizes the total Specific measures that can be taken during the utility cut excavation and reinstatement process to minimize the likelihood of road defects are “Performance based-monitoring”, it is the most significant measures, of having 0.892 RII value. The second most specific measure is “Regular inspection” with a 0.876 RII value (Rank 2). The third most specific measure is “Quality control during the construction process,” with 0.852 (Rank 3) RII values. The need for enhanced coordination between utility companies and road authorities, stricter regulatory frameworks governing utility cut procedures, and improved design and planning strategies to minimize the detrimental effects of utility cuts. Implementing these measures can enhance the longevity of flexible pavements and contribute to the overall efficiency and safety of the road network in Sri Lanka.

Keywords: Utility cuts, Flexible pavement, impact, service life.

EVALUATION OF BONDING STRENGTH AND COST-EFFECTIVENESS OF A SUBSTITUTE INTERNAL PLASTERING MIX

J. A. D. P. Anjana Jayasuriya and Kasun Nandapala

Department of Construction Technology, University of Vocational Technology, Sri Lanka.
piyum2017@gmail.com

Abstract: This research aims to identify an optimal plastering mix for internal wall applications that can serve as a substitute for the traditional mix used in the building construction industry. By experimenting with different proportions of cement, sand, wall filler, binder glue, and water, the study focuses on developing a mix with superior bonding strength and cost efficiency. Various combinations of these ingredients are investigated to determine the most effective mix, with bonding strength as the primary measure. A plaster adhesion test is conducted to compare the bonding strength of the new mix with that of a conventional mix used for internal plastering, and the cost variations of the newly developed mixes are also evaluated. The research identifies the optimal mix with the following ratio: 0.75 parts cement, 7.5 parts sand, 1.5 part internal wall filler, 0.1 part binder glue, and 1.5 parts water based on the volume. The findings provide valuable insights into the optimal proportions of ingredients that enhance bonding strength while being cost-effective, contributing to the field by offering an alternative plastering mix that could improve the efficiency and quality of internal wall plastering in the construction industry.

Keywords: Wall Plastering, Bonding Strength, Adhesion, Cost Optimization

USE OF COCONUT COIR TO IMPROVE STRENGTH PROPERTIES OF DRIED CLAY BRICKS

K. G. Alahapperuma, E. R. Madhushanka, G. T. Madhushani and R. G. P. C. Rajamanthri

*Department of Electromechanical Technology, University of Vocational Technology, Sri Lanka
kgalahapperuma@uovt.ac.lk*

Abstract: In Sri Lanka, most of the traditional domestic buildings, which include residential houses are based on clay bricks. Production of the traditional clay bricks involves a burning step using firewood, which contributes to deforestation, air pollution, and also emission of carbon dioxide gas. This step contributes to high energy consumption and associated costs as well. This study was mainly aimed at improving the strength characteristics of the unburnt clay bricks by incorporating coconut coir as a reinforcing phase to the same. Since burning of bricks hasn't taken place, all associated disadvantages aren't issues of the study. Visual appearance, density, water absorption, compressive strength, and thermal conductivity were the tested properties. Coir percentage was varied by 0%, 10%, 20%, 30%, 40% and 50% by volume. As outcomes, 10% coconut coir-added bricks were selected as the composition with the highest quality. These bricks show a better compressive strength of 1.761 Nm^{-2} compared to 1.654 Nm^{-2} of the clay bricks with no coir addition. However, none of the brick composition showed a favourable level of water absorption. Bricks with selected composition can be recommended to be applied in non-load-bearing applications where water attack is unlikely.

Keywords: Compressive Strength, Clay Bricks, Coconut Coir, Reinforcing Material, Water Absorption.

IMPACT OF BUILDING SERVICES ON CUSTOMER SATISFACTION IN SRI LANKAN HOTELS

N.S. Karunasinghe

University College of Matara, University of Vocational Technology, Sri Lanka
karunasinghe@ucm.ac.lk

Abstract: Due to the increased tendency of people to travel for various reasons, such as personal affairs, business objectives, and tourism activities, the hotel industry has experienced tremendous growth in both the global economy and Sri Lanka over the past 10 years. The hotel sector in Sri Lanka contributes more to the nation's net earnings as its third source of foreign cash. Hotels play a significant role in the lodging sector and have recently risen to the top of the list of industries in terms of global competition. It's crucial for hotel management to increase customer satisfaction to draw in future business. The purpose of this study is to examine the impact of building services on customer satisfaction in Sri Lankan hotels. The study ascertains the impact of building services on customer satisfaction in Sri Lankan hotels with reference to guests who stayed in 3-5 stars class hotels around Sri Lanka. The study is reviewed 328 guests' responses related to hotels located in down south, Colombo, Kandy, Dambulla & Trincomalee via Google form. There are three independent variables namely, safety related building services, comfortability related building services and technology related building services. Dependent variable was customer satisfaction of hotel customers. According to the statistical analysis that can prove there is a significant impact of building services on customer satisfaction in Sri Lankan hotels. The results of this study provide hotel professionals with an assessment of current methods of measuring and managing customer satisfaction and help them to realize the importance of building services to improve customer satisfaction.

Keywords: Building Services, Customer Satisfaction, Hotel Industry.

AIR QUALITY OF AIR-CONDITIONED AND NON-AIR-CONDITIONED BUSES IN SRI LANKA

Pathiranage Pubudu, M.K Jayananda and D.P.L Perera

University College of Matara, University of Vocational Technology, Sri Lanka
ppubudu@gmail.com

Abstract: Buses are a commonly used and cost-effective mode of public transportation. However, they present significant indoor air pollution risks due to their ability to accommodate a large number of passengers. This study seeks to evaluate and compare air pollution levels in air-conditioned and non-air-conditioned buses, focusing specifically on biological agents as a primary source of contamination. Key factors such as carbon monoxide (CO), carbon dioxide (CO₂), humidity, temperature, and dust levels were meticulously assessed as crucial contributors to indoor air quality. Elevated levels of air pollution inside buses can result in increased passenger fatigue and a higher risk of disease. Data was collected through continuous air sampling in both types of buses over nearly three hours, revealing notable differences in dust content, a major contributor to indoor pollution, between the two types of buses. While carbon dioxide levels in air-conditioned buses remained relatively stable, fluctuating between 356 and 364 PPM, dust concentrations varied from 6 to 8 mg/m³. These findings underscore the dynamic nature of air quality in buses and its potential impact on passenger health.

Keywords: Air quality, Air conditioning buses, Non- air-conditioned bus, Temperature controlling in buses, Air quality inside

DEVELOPMENT OF A NON-LETHAL WILDLIFE DETERRENT SYSTEM: ADDRESSING HUMAN-WILDLIFE CONFLICT WITH ASIAN PALM CIVETS IN AGRICULTURAL AND RESIDENTIAL AREAS

M.H.M Hadhil and S.V.R Gamage

*Department of Electromechanical Technology, University of Vocational Technology, Sri Lanka
hadhilhaniefa@gmail.com*

Abstract: A nocturnal animal, the Asian Palm Civet (*Pardoxurus hermaphroditus*) is widespread throughout South and Southeast Asia, including Sri Lanka. Because of their flexibility, they frequently invade suburban and urban areas, causing disruptions, fruit theft, and property damage. Furthermore, there are health risks because civets can carry zoonotic infections. Conventional deterrent techniques, such sound repellents and electric fences, are sometimes inefficient, expensive, and unsuitable for broad application. This study describes the development of a non-lethal wild-life deterrent system intended to keep Asian palm civets out of residential and agricultural regions. By using a laser light as a visual deterrent, the system seeks to over-come the drawbacks of current techniques in a way that is both ethical and practical. The efficiency of the deterrence system was assessed during a nine-day period. According to preliminary observations, the civets were successfully scared and repulsed by the laser light, which caused them to run away. The civets avoided the region more and more as the testing went on, suggesting a successful long-term deter-rent impact. In summary, the approach that was designed turned out to be a humane and efficient way to reduce conflicts between Asian palm civets and people. The technology demonstrates potential as a long-term solution for preventing wildlife in-filtration into agricultural areas and human settlements, despite several shortcomings, such as false activations brought on by non-target motions.

Keywords: Non-Lethal Wildlife Deterrent, Human-Wildlife Conflict, Asian Palm Civet Management, Agricultural Protection.

IMAGE-BASED QUALITY INSPECTION IN METAL ROOFING SHEETS PRODUCTS USING IMAGE PROCESSING

Sondarangallage D.A. Sanjeewa, K A S Dilthara and N.S.Samarakoon

*Department of Electro Mechanical Technology, University of Vocational Technology,
Sri Lanka
sdasanjeewa@uovt.ac.lk*

Abstract: Metal roofing sheets have a vital function in the construction sector, serving to safeguard and enhance the visual appeal of buildings. Colored metal roofing is highly preferred due to its exceptional durability and aesthetic appeal. It is important to guarantee the quality of these sheets. However, the existing method of inspecting them manually, which depends on human participation, is both time consuming and prone to mistakes. Progress in computer vision has led in a development of effective solutions for complex issues in industrial quality inspection processes. This study suggests the use of an automated image-based inspection system to improve the quality inspection process in the roofing sheet manufacturing industry. The paper described use image processing algorithms to identify surface defects on metal roofing sheets. The method commences with the acquisition of images of the metal roofing sheets, which is then followed by a sequence of stages comprising image conversion, denoising, enhancement, normalization, thresholding, and feature extraction. These strategies jointly improve the precision and effectiveness of the quality inspection process, decreasing the need for manual methods and reducing the chance of human mistakes.

Keywords: Image processing, Defect detection, Metal sheets.

08th International Symposium of University of Vocational Technology 2024

Rathmalana, Sri Lanka | 12th. December 2024

**AUTOMATION OF TRADITIONAL AGRICULTURE:
ROBOT HARVESTING WITH CHALLENGES**

D.S.B Ratnayake

*Industrial Engineering Training Institute, Sri Lanka
ratnayakeduminda394@gmail.com*

Abstract: Modern agriculture produces maximized yield, high profit and fulfills the human food needs. Majority developing countries provide 80% of farm power from humans while developed countries use machines. Farm mechanization is timely efficient and enhances crop quality with potential yield per unit area. Therefore, Agricultural automation including harvesting is crucial. Author presents a comparative discussion on the applications of robot harvesting for traditional Agriculture with some challenges. The study employs a qualitative methodology, focusing on content analysis of existing literature. Overall farm productivity can be significantly increased by robot harvesting while focusing on other farming activities. It replaces the manual traditional harvesting by upgrading the quantity and quality with less farming efforts. Majorly, different kinds of fruits and vegetables are harvested by robots. The discussion is mainly based on path navigation of robots, using algorithmic functions aided with sensors and cameras to detect the real time of harvesting. Robotic arms or other tools are utilized to harvest without damaging. Monitoring of crop health and nutrient deficiencies, thinning, pruning, spraying and bagging functions in green houses, orchards and open fields are performed with the automation. Research difficulties on scarcity of actual in-depth data, variations of feed-back from end users, issues on visual processing efficiency and economic aspects including initial investment and higher expenditure are the challenges on the approach. Traditional harvesting can be replaced by robotic harvesting with some challenges. Extended research based on socio-economical aspects and; crop specific, regional based and in-depth experiments are needed to enhance the technology.

Keywords: Agriculture, Mechanization, Oppositions.

DESIGN AND IMPLEMENTATION OF SMART SHOCK ABSORBER INTEGRATED WITH GPS-BASED ROAD CONDITION ANALYSIS

C. M. S. Madushan and M. Barathy

*Department of Electro-Mechanical Technology, University of Vocational Technology, Sri Lanka
barathy@uovt.ac.lk*

Abstract: This research presents the design of a smart shock absorber system integrated with GPS-based road condition analysis for optimizing vehicle suspension and implementation of a performance. The aim is to enhance ride comfort, stability, and safety by dynamically adjusting shock absorber characteristics in response to varying road conditions. The proposed system leverages real-time data from GPS navigation systems to analyze road conditions such as surface roughness, potholes, and bumps. Through advanced algorithms, the shock absorbers adapt their damping properties accordingly to mitigate the effects of road disturbances on the vehicle. The integration of GPS-based road condition analysis provides a proactive approach to suspension control, enabling precise and timely adjustments to optimize ride quality and handling. Experimental validation of the system demonstrates its effectiveness in improving overall vehicle dynamics and passenger comfort, highlighting its potential for integration into future automotive platforms.

Keywords: shock absorber, suspension control, GPS-based analysis

DESIGN OF A FULL-BODY COVERED SAFETY AIRBAG SYSTEM FOR MOTORCYCLISTS

P. I. Madhusanka and M. Barathy

Department of Electro-Mechanical Technology, University of Vocational Technology, Sri Lanka
barathy@uovt.ac.lk

Abstract: Motorcycle accidents often result in serious injuries, particularly due to the lack of adequate protection for riders. This project proposes the design of a full-body covered safety airbag system specifically tailored for motorcyclists to mitigate the severity of injuries in the event of a crash. The system integrates advanced sensors and algorithms to detect imminent collisions or loss of control, triggering the deployment of airbags across the rider's body. Key components include robust crash detection sensors, a central processing unit for real-time data analysis, and strategically placed airbags that inflate within milliseconds to shield the rider's head, torso, limbs, and back. The design considers ergonomic factors to ensure comfort and unrestricted movement while riding.

Through rigorous testing and simulations, the efficacy and reliability of the proposed system will be evaluated to meet safety standards and enhance overall rider protection. The ultimate goal is to contribute to reducing fatalities and serious injuries among motorcyclists, thereby promoting safer riding experiences. This research represents a critical step towards enhancing motorcycle safety through innovative technology, offering a promising solution to mitigate the impact of accidents and promote safer riding practices.

Keywords: Airbag system, Sensors, Algorithms.

DEMOLITION WASTE MANAGEMENT OF CIDA-REGISTERED CONSTRUCTION COMPANIES IN JAFFNA DISTRICT AND POSSIBLE IMPROVEMENT STRATEGIES

K. Thifya and T.D. Denagama

Department of Construction Technology, University of Vocational Technology, Sri Lanka
tdenagama@yahoo.com

Abstract: Demolition waste comprises concrete, wood, brick, clay tile, steel, and asphalt shingles generated from demolishing structures. Jaffna district is selected as the study area. Illegal dumping of demolition waste has recently increased, and construction companies reuse the demolition waste for several purposes. It is necessary to study demolition waste management to determine whether the existing system has the quality and to save the environment. This study focuses on existing demolition waste management, the construction companies' awareness of the 4R Principle, and how it can be improved. Samples are selected from CIDA-registered construction companies belonging to the Jaffna district. It finds construction companies belonging to the Jaffna district have 'Trade-off' as the predominant practice of demolition waste management, they moderately follow the 4R Principle and they believe the government should take necessary action to improve waste management. As per the experts' opinion, durability is unpredictable while reusing demolition waste so educating, experimenting, and providing local recycling programs are the improvement strategies.

Keywords: Demolition waste management; Construction companies; 4R principle; Jaffna district

AN ASSESSMENT OF WATER QUALITY RELATED ISSUES IN POLGOLLA RESERVOIR, SRI LANKA

A.P.G.G.C. Bogahawaththa and T.D. Denagama

Department of Construction Technology, University of Vocational Technology, Sri Lanka
tdenagama@yahoo.com

Abstract: The Polgolla Reservoir, a vital water body in Sri Lanka, plays a significant role in regional water management by providing water for agriculture, drinking, and hydropower generation. This study aims to assess the current state of water quality in the Polgolla Reservoir by examining various physicochemical parameters including pH, turbidity, dissolved oxygen, nitrate, salinity, and BOD₅. Water samples were collected from multiple points within the reservoir and analyzed using standard methods. The findings indicate elevated levels of pollutants, particularly nitrate, primarily due to agricultural runoff and improper waste disposal. Additionally, heavy metal contamination was detected, raising concerns about long-term ecological impacts and human health risks. The study identifies potential sources of pollution and suggests mitigation strategies such as improved agricultural practices, wastewater treatment enhancements, and public awareness campaigns. This assessment underscores the urgent need for integrated water resource management to preserve the water quality of the Polgolla Reservoir and ensure its sustainable use for future generations.

Keywords: Polgolla Reservoir, Water Quality, Mahaweli River

DETERMINATION OF EFFECTIVENESS OF DOMESTIC SEWERAGE SYSTEM IN HIGH WATER TABLE AREA AT SATHSEVANA CHIDERN'S HOME IN MIRIGAMA SRILANKA

S.D.G.M. Sirimanna and T.D. Denagama

Department of Construction Technology, University of Vocational Technology, Ratmalana
tdenagama@yahoo.com

Abstract: The efficient operation of domestic sewerage systems is essential for public health, environmental protection, and community well-being. High water table areas present unique challenges for wastewater management, necessitating a thorough examination of existing systems to evaluate their effectiveness and resilience. This study investigates the domestic sewerage system at Sathsevana Children's Home in Thawalampitiya, Sri Lanka, an area characterized by high water tables due to its geographical and climatic conditions. Specific objectives include examining the impact of water table fluctuations on system performance, assessing structural integrity, and recommending actionable solutions. Site surveys and visual inspections were conducted to identify visible defects in the sewerage infrastructure. Water table fluctuations were monitored over four months using data from ten wells. Water quality was tested for E. coli contamination, and soil percolation rates were measured. The interview with the superintendent provided insights into daily wastewater output, informing system design improvements. The sewerage system at Sathsevana comprises concrete manholes, a septic tank, a brick soakage pit, and PVC pipes. High water tables during the rainy season compromise the system's efficiency, leading to potential overflow and contamination issues. Visual inspections revealed structural defects, including leakage points in the septic tank and pooling in manholes. Water quality tests indicated significant E. coli contamination, underscoring the need for immediate remediation. Water table analysis highlighted seasonal fluctuations, with the highest levels recorded in May. Immediate repair of septic tank leakage points and improvements in drainage and absorption capacity of the soakage pit are essential. Sustainable design modifications, including resizing the septic tank and enhancing soil percolation rates, are proposed to accommodate seasonal water table variations. Implementing these measures will ensure effective wastewater management and environmental protection in high-water table areas. The

study provides valuable insights into the challenges and solutions for managing domestic sewerage systems in high-water table regions. The findings and recommendations contribute to developing resilient and sustainable wastewater management practices, enhancing public health and environmental integrity in affected communities.

Keywords: Septic System, Soakage pit, High water table, Percolation.

BARRIERS AND CHALLENGES IN IMPLEMENTING MODULAR CONSTRUCTION METHODS IN SRI LANKAN RESIDENTIAL CONSTRUCTION PROJECTS

N. S. H. Bandaranayake and Hong Xiao

College of Built Environment, Birmingham City University, United Kingdom
niroshanasaliyab@gmail.com

Abstract: Modular construction methods are identified as a green, efficient, and cost-effective approach in the world. This study was conducted with the goal of identifying the factors that prevent the use of modular construction in residential buildings in Sri Lanka. Hence this study was focused to identify the socioeconomic, cultural, and technological barriers to the integration of modular building in this respect. The study employed a qualitative research approach, with in-depth semi-structured interviews conducted on respondents from the Sri Lankan construction sector, including architects, engineers, and project managers. Thematic analysis was used to assess the obtained data to uncover recurring patterns and themes in response to the problems of modular construction. Some of the key issues identified are lack of awareness and enlightenment about the modular construction method among all relevant stakeholders, ranging from building professionals to public, high initial costs, poor/reduced government support, technical constraints such as a poor infrastructure base, insufficient skilled and trained personnel, and others. According to the conclusions of this study, these problems must be solved by a collaborative effort by the Sri Lankan government, industry professionals, and educators, with an emphasis on regulations, awareness, investments in framework, technology, and skills. Practitioners can use these findings to modify policies, implement cutting-edge technologies, and provide workforce training in order to incorporate modular construction methodologies into projects and get around current problems like high initial investment, bureaucratic roadblocks, and a lack of skilled labour.

Keywords: Efficient, Green, Modular, Sustainable

LIFE CYCLE COST ANALYSIS OF SUITABLE WALL FINISHING MATERIALS FOR RESTAURANT BUILDINGS IN SRI LANKA

A. M. Azam and M. D. Rathnayake

University College of Anuradhapura, University of Vocational Technology, Sri Lanka
asam2410@gmail.com

Abstract: This study evaluates the impact of material selection on the lifecycle cost (LCC) of restaurant buildings in Sri Lanka, with a focus on wall finishing materials. The growing restaurant and hotel industry in Sri Lanka is recovering from economic challenges, including the COVID-19 crisis. This research investigates how the durability and performance of wall materials influence both the initial and long-term costs of construction and maintenance. Data was gathered from 10 industry experts, with insights from restaurant constructions near the north-west and beach areas of Sri Lanka. Results indicate that while some materials have higher up-front costs, their longer lifespan and reduced maintenance needs make them more cost-effective in the long run. The findings provide valuable recommendations for stakeholders in the construction sector to make informed decisions about material selection, highlighting the importance of proper maintenance and renovation to extend the lifespan of restaurant buildings.

Keywords: Economic Impact, Life Cycle Cost Analysis (LCCA), Restaurant Buildings, Sri Lanka Construction, Wall Finishing Materials.

TECHNICAL SESSION 3

DIGITAL TECHNOLOGIES AND CREATIVE INDUSTRIES

AN ENHANCING PUBLIC TRANSPORTATION IN SRI LANKA THROUGH REAL-TIME TRACKING AND BOOKING SYSTEM

K. P.V. N. Pathirage, A. I. Chathurangi, D. M. H. Madushani and P. Uruthiran

*Department of Software Technology, University of Vocational Technology, Sri Lanka
uruthiran@uovt.ac.lk*

Abstract: This research is about creating a Bus Tracking and Booking System designed specifically for the transportation system in Sri Lanka. The goal is to make public transportation better by using technology. The system will help users track buses in real-time and easily book their rides. The aim is to improve the way buses operate and make public transportation more modern and user-friendly in Sri Lanka. It uses advanced technologies like GPS and mobile apps to give users accurate and current info about bus locations, schedules, and available seats. It also has an easy-to-use booking system, allowing passengers to reserve and buy bus tickets without any hassle. The studies worked together with stakeholders like transit authorities to create a system that meets the specific needs of Sri Lanka. A database has been built into the system, and user-friendly interfaces, and tested everything thoroughly to make sure the system works reliably. Results from the implementation demonstrate a significant improvement in the accessibility and efficiency of bus services. Passengers can now plan their journeys more effectively, reducing waiting times and enhancing overall satisfaction. Transit authorities benefit from enhanced operational insights, enabling better resource allocation and schedule optimization. In conclusion, the Bus Tracking and Booking System presented in this research represents a technological advancement in the Sri Lankan public transportation landscape. The successful implementation of this system not only addresses current challenges but also lays the foundation for future innovations in the realm of smart and sustainable urban mobility.

Keywords: Bus Tracking, Online Booking, Public Transportation, Real-Time, User-friendly Service.

DESIGN AND DEVELOPMENT OF A DATABASE-DRIVEN APPLICATION FOR SINHALA ETYMOLOGICAL ANALYSIS

K.P.D.S.L Kodagoda and H.G.C.K Hulangamuwa

*School of ICT / Nāgānanda International Institute for Buddhist Studies, Sri Lanka,
lasikakodagoda26@gmail.com*

Abstract: The Sinhala language, a member of the Indo-Aryan family, is spoken by over 20 million people in Sri Lanka and boasts a rich etymological heritage shaped by influences from Sanskrit, Pali, and Dravidian languages. However, the lack of digital tools tailored for its linguistic study has hindered systematic analysis of its etymological and morphological structures. This research presents the design and development of a database-driven application that serves as a repository of Sinhala words annotated with detailed etymological information. The application classifies words into derivative, borrowed, or native categories, generates grammatical forms for linguistic exploration, and offers an intuitive web-based interface for users. The open-source platform is geared towards educational and research purposes, aiming to support advancements in Sinhala linguistic studies. The paper details the design, implementation, and validation process, highlighting the tool's potential to enhance etymological research and pedagogy.

Keywords: Sinhala language, Etymological Analysis, Morphological Analysis

DEVELOPMENT AND EVALUATION OF AN AUTOMATED STUDENT ATTENDANCE TRACKING SYSTEM USING FACIAL RECOGNITION TECHNOLOGY

**D. A. N. T. Perera¹, T. K. Malwatta², P. H. S. S Wijerathne² and L. S. M. N. D.
Senanayaka¹**

¹Department of Information and Communication Technology, University of Sri Jayawardenapura, SriLanka

*²Department of Multimedia Technology, University of Vocational Technology, Sri Lanka
nawodathejani1999@gamil.com.com*

Abstract: Face recognition technology has become a critical tool in image processing, offering innovative solutions for automation in various fields. This research presents the development of an automated student attendance tracking system using facial recognition to address inefficiencies in traditional attendance methods. Conventional systems, such as roll calls and manual record-keeping, are time-consuming and prone to human error and manipulation, including proxy attendance. The proposed solution aims to digitize and streamline the attendance process, reducing administrative burdens and improving accuracy. The system utilizes Haar Cascade classifiers for face detection and a K-Nearest Neighbors (KNN) algorithm for facial recognition. Real-time video is captured through a webcam, allowing the system to detect and recognize students. Once recognized, the system automatically logs attendance and generates reports in CSV format, facilitating easy data management. To enhance user experience, the system also features text-to-speech feedback, providing audio confirmation for each recognized student. By eliminating manual intervention, the system ensures accurate and reliable attendance records, significantly reducing errors and improving data integrity. Its intuitive interface allows both students and educators to navigate the system effortlessly. Additionally, the solution is cost-effective and requires minimal installation effort, making it practical and feasible for widespread adoption. This approach not only modernizes attendance tracking but also minimizes human effort, offering a robust and efficient alternative to traditional methods. The system demonstrates the potential to transform how attendance is managed in educational institutions, addressing challenges such as time consumption and error-prone data entry with a scalable, automated solution.

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Keywords: Automated Attendance, Face Recognition, Biometric Authentication.

NATIVE TAMIL NEWS ARTICLE SUMMARIZATION

Satheeskumar.Y¹ and Chandana.G²

¹*Department of Multimedia and Web Technology, University of Vocational Technology, Sri Lanka*

²*Department of Computer Science & Engineering, University of Moratuwa, Sri Lanka
mmw2014b106@uovt.ac.lk*

Abstract: This research addresses the increasing trend of online news consumption within the Tamil-speaking community, driven by the growth of Internet technology. With the rise of online Tamil news platforms, readers can access a wide range of topics, but the absence of summarization in news articles poses challenges for efficient consumption. The research aims to employ machine learning techniques, specifically leveraging the XL-Sum model, for text summarization of Tamil news articles. The XL-Sum model comprises one million pairs of summaries and the news, annotated by professionals, covering 44 languages. Most research has focused on abstractive summarization in high-resource languages such as English, with limited work in low-resource languages like Tamil. The chosen XL-Sum model stands out as a large-scale multilingual abstractive summarization model and has been used with the custom dataset collected by the authors from selected Sri Lankan websites, consisting of 49 news and summary pairs annotated by professionals. The method involves gathering strategic data, selecting the XL-Sum pre-trained model, modifying and adapting it for Tamil, building a training dataset, re-training the model, and employing human evaluators to assess the quality of generated summaries, assigning ratings from high to medium. Key results include ROUGE scores comparing the new dataset with the existing model dataset, showing that the higher scores depend on the dataset's weight and fine-tuning the model. As an outcome, the authors can be able to release the new dataset for wider research community, providing news articles and their summarizations in Tamil from the Sri Lankan Community.

Keywords: Custom Dataset, Low-Resource Language Summarization, Machine Learning, Sri Lankan Tamil Dataset, XL-Sum Model.

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TECHNICAL SESSION 4

INNOVATION AND ENTREPRENEURSHIP FOR ECONOMIC RESILIENCE

GENERATIVE AI-POWERED ORGANIZATIONAL LEARNING CULTURES IN SRI LANKA AND EMPLOYEES' PERCEPTIONS

D.L.N.P. Amarawickrama and U. Sivachelv

Department of Industrial Management, University of Vocational Technology, Sri Lanka
E-mail-corresponding nayanamgt@gmail.com

Abstract: This study examines the integration of Generative Artificial Intelligence (GAI) into Sri Lankan organizational learning. While GAI offers the potential for personalized and effective learning, its adoption is still nascent. A quantitative research approach was adopted, utilizing purposive sampling to select 100 respondents who actively employed GAI for their further learning. Employee perceptions, influenced by factors like prior artificial intelligence exposure and organizational support, are crucial for successful implementation. The research confirms GAI's positive impact on learning efficiency and effectiveness, emphasizing the importance of organizational support, technology, and employee readiness for its successful integration.

Keywords: Employees' Perceptions, Generative Artificial Intelligence, Organizational Learning Cultures, Sri Lanka, Technology Adoption.

OPTIMIZING INVENOTRY THROUGH ABC-FSN ANALYSIS

G. Wickramasinghe¹, Jayalal Wettasinghe² and Kasun Lankapura³

¹ National Water Supply & Drainage Board, Sri Lanka

² Department of Electromechanical Technology, University of Vocational Technology, Sri Lanka

³ Asian Aviation Centre (Pvt) Ltd, Sri Lanka

gayanwickramasinghe06@gmail.com

Abstract: Effective inventory management is crucial for optimizing resources and ensuring uninterrupted operations in utility services like water supply. This research focuses on the application of ABC and FSN methods to optimize inventory within the central north region of the National Water Supply and Drainage Board. The study aims to identify critical inventory items by categorizing them based on their consumption value and movement frequency, which are essential for making procurement and stocking decisions. By analyzing 61 inventory items, including both fast-moving and slow-moving categories, this research provides a detailed classification that highlights the areas of excess stock and potential shortages. The integration of ABC-FSN analyses helps in prioritizing inventory control efforts, thereby reducing costs and improving the overall efficiency of the inventory management process. The findings underscore the importance of tailored inventory strategies for different categories of items, ensuring that the National Water Supply and Drainage Board can maintain optimal stock levels, reduce waste and enhance operational effectiveness. This study offers a practical approach to inventory optimization that can be adapted by other utility services facing similar challenges.

Keywords: Inventory Management, Optimization, ABC Analysis, FSN Analysis

PURCHASE INTENTION OF CLOUD PRODUCTS: A STUDY OF SMALL AND MEDIUM ENTERPRISE CUSTOMERS IN LEADING TELECOMMUNICATION PROVIDER IN SRI LANKA

Rumesh Chathuranga Kumaradasa¹, and Indika Priyantha Kaluarachchige²

¹Sri Lanka Institute of Marketing, Sri Lanka

²University College of Matara, University of Vocational Technology, Sri Lanka

rck.guitarist@gmail.com

Abstract: The study aims to identify the factors influencing customers' purchase intention of cloud products focusing on Small and Medium Enterprise customers in the leading telecommunication provider in Sri Lanka. Perceived value, price, brand image, and sales promotions were identified as predictors of purchase intention based on the literature. A structured questionnaire was employed to collect data from conveniently selected 217 small and medium enterprise customers in the Western Province region of Sri Lanka. Collected data were analyzed using correlation and regression analyses. As per the results of the study, perceived value and price were significant factors in the purchase intention of cloud products. Customers highly consider the perceived value when they purchase cloud products. Effective business strategies should focus on especially the value and the price to enhance the purchase of cloud-based services in Sri Lanka.

Keywords: Brand Image, Perceived Value, Price, Purchase Intention, Sales Promotion.

OPTIMIZATION OF A SINGLE SUPPLIER RAW MATERIALS INVENTORY SYSTEM IN A FABRIC MANUFACTURING PLANT

K. Lankapura¹ and Jayalal Wettasinghe²

¹Asian Aviation Centre (Pvt) Ltd., Sri Lanka

²Department of Electromechanical Technology, University of Vocational Technology, Sri Lanka
kasunlankapura@gmail.com

Abstract: Inventory management plays a vital role in most of the business organizations today in the competitive business environment as there is always an associated cost component with the inventory. In any industry or manufacturing organization, control of the inventory is highly essential in order to fulfill the requirement of the raw materials, sub-assemblies and other relevancies without any shortage. If there is any shortage, that might interrupt the routine operations of the plant. On the other hand, maintaining an excess amount of inventory is also a burden most of the time. Because most of the costs components associated with the inventory rise up with the level of inventory. In this study, the in-house raw material inventory system of a specific fabric manufacturing plant is considered. In order to optimize the raw materials inventory, a simulation study is conducted with the aid of simulation software. As the results of optimization experiments an optimal reorder point is proposed, leading to a reduction in the raw materials inventory levels, and thereby reducing the overall inventory cost of the organization.

Keywords: Inventory, Simulation, Optimization.

08th International Symposium of University of Vocational Technology 2024

Rathmalana, Sri Lanka | 12th. December 2024



AN EFFECT OF MAS HOLDINGS IN THE SRI LANKAN GARMENT INDUSTRY

Thiwanka Srinath K.M and Sivachelvy U

Department of Industrial Management, University of Vocational Technology, Sri Lanka
sivachelvy@uovt.ac.lk

Abstract: In this study the Sri Lankan garment industry and MAS Holding Company considered, it can be recognized that the garment industry has been taken to a new dimension by obtaining a record income in the year 2023. The main research problem is to find out the effects of MAS Holdings on the Sri Lankan garment industry. The purpose of this research is to study the success and failure of the MAS Holding company, which is a major milestone in the Sri Lankan garment industry, and to study the nature of the Sri Lankan garment industry. The reason behind this was that MAS Holdings has positively impacted the apparel industry in Sri Lanka in the year 2023. This study was conducted specifically for MAS Holdings. Data was collected for this research study using the interview and observation methods. Information was obtained from two experts who are engaged in the garment industry. Moreover, qualitative and quantitative data were used for this study. There are various garment factories in Sri Lanka and among those various factories, only MAS Holding is used for this research. In the research study, it was found that Mass Holding has a positive effect on Sri Lanka's garment industry. This research was done in such a way that it is important for future researchers who conduct research on the country's economic development.

Keywords: Apparel Manufacturing, Fashion Brand, Garment Industry, International Market, MAS Holding, Positive Influence.

CUSTOMER CHURN OF FIBRE RETAIL CUSTOMERS IN LEADING TELECOMMUNICATION SERVICE PROVIDER IN SRI LANKA

S H Hettiarachchi¹, and Indika P Kaluarachchige²

¹*Sri Lanka Institute of Marketing, Sri Lanka*

²*University College of Matara, University of Vocational Technology, Sri Lanka*
Sulakshihimesha99@gmail.com

Abstract: Sri Lanka's telecommunication sector has experienced significant growth, with a competitive market with multiple providers. This research aims to identify the factors affecting customer churn in a leading telecommunication company in the Sri Lankan telecommunication industry. Researchers identified service quality, price value, and competitor offer as the main contributing factors for customer churn which is the outcome variable of the study. Hypotheses were advanced as there are significant impacts of service quality/ price/ competitor offers on customer churn. Data was collected from 174 fiber retail customers of the selected telecommunication service provider through a structured questionnaire and processed those data by using correlation and regression analyses. As per the findings of the study, all predictors such as service quality, price value, and competitors offer significant effects on customer churn while service quality is the most important contributing factor. It is recommended to enhance the quality of the service to reduce customer churn and the company should pay attention to the competitor offers and the price of the product. This study will help to add something to the existing body of knowledge and to make customer-oriented decisions effectively to reduce customer churn.

Keywords: Competitor Offer, Customer Churn, Price, Service Quality.

UNIVERSITY WORKING STUDENTS' TIME MANAGEMENT AND ITS EFFECT ON ACADEMIC SUCCESS.

P.G.S.M.Chandrarathna and B.M.T.D.Jayasekara

*Department of Industrial Management Technology, University of Vocational Technology, Sri Lanka
maduwanthipgs@gmail.com*

Abstract: This study focuses on the importance of time management on the academic achievements of university students in higher education and how they respond to all challenges and tasks presented by such an environment. This study uses a quantitative approach, through which the primary source of data is collected by a questionnaire and responses from 51 university-working students at the University of Vocational Technology. Secondary data were sourced from academic journals and books that provide context and insights. Three main topics emerge from the study, in areas of planning, timeliness, and work-life balance. Now the results indicate at least a 98% improvement in academic performance among students who stick to punctuality and plan out study routines. Students, on the other hand, have family responsibilities, stress, and a workload to deal with, all of which can interfere with effective time management. Furthermore, it emphasizes the need for appropriate planning and time management skills, which are necessary for both academic and personal development. Similar to the recommendations proposed by the experts, this study also concludes that educational institutions need to provide tools and training through which students can practice these abilities and thus facilitate their academic and professional growth. This study contributes to the existing knowledge on the use of time management skills to enhance academic performance and quality of student life.

Keywords: Time management, Academic success, University students

THE FACTORS INFLUENCING TOURISTS' SATISFACTION AND THEIR IMPACTS ON DESTINATION LOYALTY IN DOMESTIC TOURISM IN SRI LANKA

K. Shanmuganathan

*University College of Jaffna, University of Vocational Technology,
Sri Lanka
k.shan77911@gmail.com*

Abstract: The objective of this study was to determine the factors that influence tourists' satisfaction and their impact on loyalty in domestic tourism in the Unnichai Pond of the Batticaloa district. Studies on tourism destination in that place were rarely available. The current study closes this research gap, which is critical for the development of sustainable tourism. The mixed research approach was used, and data were collected from 261 respondents. AMOS and SPSS were used for the data analysis. The findings of the study are discussed below. The attractiveness of a destination played a significant role in tourists' satisfaction and loyalty. Significantly, the surrounding environment, the water scene, and cleanliness were important components of the attraction. The accessibility of the destination was a wonderful feature that impacts tourists' devotion. Furthermore, a well-protected road and accessibility for food, beverages, and necessities enhanced the trustworthiness of the destination. Entertainment had a favorable impact on the loyalty of travelers, and fishing, boating, and festival celebrations, which were important components of the entertainment. Safety was one of the key factors that creates trustful tourists, which included an atmosphere that is free from fear of people, animals, and natural disasters. Additionally, travelers were pleased with their money spent on the trip. The cost of transportation and consumables were the key determinants of travelers' perception, which encouraged destination loyalty. However, there were unsatisfactory aspects, including lifeguard facilities, relaxation, kids entertainment, photo shoot risks, internet connection, service conditions, and urban transportation, that affected the destination loyalty. The current study is crucial for further research and a useful reference for policymakers in domestic tourism.

Keywords: Domestic Tourism, Destination Loyalty, Unnichchai Pond.

REVIEW ON SKIN DEPIGMENTING ACTIVITY OF COMMON MEDICINAL PLANTS USED IN SRI LANKAN TRADITIONAL BEAUTY REMEDIES

Gunarathna B.W.A.S and Amali T.A.D.H

*University College of Kuliyapitiya, University of Vocational Technology, Sri Lanka.
drayeshasg@gmail.com*

Abstract: Cosmetology is one of the world's oldest professions and has become the most demanding field in the modern era. Skin complexion is considered one of the prominent and important features of beauty. Melanin is the main responsible pigment for determining skin color. The result of excess melanin production, distribution, or transport is known as Hyperpigmentation and it becomes one of the common aesthetic problems among people. A range of cosmetic treatments are available for the management of various hyperpigmentation conditions. However many commercially available synthetic cosmetic products lead to side effects and long-lasting health problems due to harmful ingredients. Also reported some drawbacks. In this situation, natural ingredients can be effectively used for preparing cosmetic products to obtain better outcomes. Hence the objective of this study was to scientifically emphasize the de-pigmenting effect of common medicinal plants mentioned in Sri Lankan traditional beauty remedies for the management of hyperpigmentation-related cosmetic problems. A comprehensive literature search was conducted through different scientific databases and authentic Ayurveda texts. The PRISMA checklist guided the data assessments. The results of the study summarized that most of the phytoconstituents present in these medicinal plants act as potential agents in the skin de-pigmenting process in several ways mainly including significant tyrosinase inhibitors, powerful antioxidants, and as modulating agents of different cellular signaling pathways on melanogenesis pathway. Hence these medicinal plants may play a significant role in treating skin hyperpigmentation. Further, it would provide an intuition to explore new therapeutic strategies based on data linked with traditional knowledge systems. However, the experimental effect, and safety, of the medicinal plants require further determination before studying their clinical efficacy.

Keywords: Medicinal plants, Skin hyperpigmentation, Tyrosinase.

ASSESSING THE ENTREPRENEURIAL INTENTIONS OF COSMETOLOGY STUDENTS IN SRI LANKAN UNIVERSITY COLLEGES

Nirmalan T.E, De Silva J.H.I.G, and Kiruththiga R.

*University College of Jaffna, University of Vocational Technology,
Sri Lanka
enthembamala@ucj.ac.lk*

Abstract: This study investigates the entrepreneurial intentions of cosmetology students in Sri Lankan university colleges through the Theory of Planned Behavior (TPB). The research aims to understand the factors driving students' intentions to pursue entrepreneurship in the beauty industry by examining how personal attitudes, subjective norms, and perceived behavioral control variables influence these intentions. Data were collected from 103 students using a validated questionnaire and analyzed using SPSS 25. The findings reveal that personal attitudes, subjective norms, and perceived behavioral control significantly influence the entrepreneurial intentions of cosmetology students in Sri Lankan university colleges. Positive attitudes toward entrepreneurship emerged as the most substantial predictor, followed by perceived behavioral control and subjective norms. These findings suggest that enhancing students' confidence, providing strong social support, and fostering positive attitudes toward entrepreneurship are crucial for developing entrepreneurial intentions. Addressing these factors can significantly enhance the entrepreneurial readiness of cosmetology students, contributing to a more dynamic and successful beauty and personal care industry in Sri Lanka.

Keywords: Cosmetology, Entrepreneurial Intentions, Theory of Planned Behavior, Vocational Education, Sri Lanka.

REVIEW OF TOXIC CHEMICALS IN COSMETICS

R.M.D.N. Bandara¹, J.H.I.G. De Silva² and G.S. Prasanna³

¹Department of Botany, Faculty of Science, University of Ruhuna, Sri Lanka

²Division of Applied and Natural Sciences, University College of Matara, University of Vocational Technology, Sri Lanka

³Department of Health, District General Hospital, Angunukolapelessa, Sri Lanka.
dinelkanishani99@gmail.com

Abstract: Cosmetic products play a significant role in personal care routines worldwide, including in Sri Lanka. Cosmetics are made of mixtures of ingredients. Concerns regarding the quality and safety of these products have grown due to the potential presence of harmful chemical ingredients and inconsistent product formulations. In recent years, the use of this cosmetically based personal care has increased throughout the world. Initially the cosmetics consisting of natural products. However, in present days, a high assimilation of chemical substances in formulation as preservatives, fragrances, surfactants, stabilizers are significant. The chemical additives which are used in the formulation of cosmetic products are bioactive and pose toxic effects to the human body. This study reviews current regulatory frameworks, industry practices, and consumer awareness, highlighting gaps that allow the continued use of hazardous ingredients focusing on commonly used ingredients such as parabens, phthalates, formaldehyde-releasing agents, heavy metals and synthetic fragrances. The presence and implications of such ingredients despite their potential adverse effects on human health. These ingredients in cosmetics are linked to adverse effects including endocrine disruption, carcinogenicity, neurotoxicity, immune-toxicity, geno-toxicity, skin sensitization, and environmental toxicity. Long-term exposure of these substances may lead serious health outcomes, including hormonal imbalances, reproductive and development disorders, allergic reactions and skin barrier damage. Furthermore, emerging trends in green chemistry and sustainable alternatives are discussed here as viable solutions to mitigate these risks. This comprehensive analysis aims to empower consumers, stakeholders including researchers and policymakers to prioritize health and pressing need for safer cosmetic formulations and stricter oversight.

Keywords: Biological risk, Chemical components, Cosmetics, Harmful effects, Human health, Risk mitigation, Toxics.

PROMOTING SUSTAINABLE NATURE TOURISM THROUGH VISITOR INTERPRETATIVE INFRASTRUCTURE AS TOURISM EDUCATIONAL TOOL IN HORTON PLAINS NATIONAL PARK

U.A. Dhanusha Premarathna

University College of Ratmalana, University of Vocational Technology, Sri Lanka
dhanushaprem@gmail.com

Abstract. Interpretation is an educational activity which aims to reveal meanings and relationships through the use of objects, experiences and by illustrative media to communicate information to a particular audience. From the view point of tourism, interpretation provides visitors with information and education, connects people to places and focused on protection and preservation. This study has implemented to observe the availability of visitor interpretive infrastructure in Horton Plains National Park and to understand how visitor interpretive infrastructure influence on tourist education on sustainable nature tourism in Horton Plains National Park. Qualitative research approach and the case study research design have been adopted to understand the influence of visitor interpretive infrastructure through the experiences, views and ideas of particular respondents who visited Horton Plains National Park. Primary data collection has been conducted through observations and semi structure interviews with the visitors. Convenient sampling technique has been adopted to collect data from 17 semi structural interviews. Under the inductive analysis approach, the content analysis method was adopted for data analysis. Recommendations of this study focus on qualitative improvements of visitor interpretive infrastructure facilities in Horton Plains National Park.

Keywords: Infrastructure, Interpretation, Education

EXPLORING THE FACTORS AFFECTING ON TOURIST SATISFACTION WITH RIDE-SHARING SERVICES IN SRI LANKA (WITH SPECIAL REFERENCE TO COLOMBO DISTRICT)

K.H. Pavithra and H.F.N.U. Fonseka

*University College of Batangala, University of Vocational Technology, Sri Lanka
hasinikottage@gmail.com*

Abstract: Smartphones with powerful functionalities and technological growth have given tourists access to a wide range of service apps, which have transformed the tourism industry's business model. Particularly, mobility and transportation apps that assist users in navigating and using different modes of transportation, like ride-sharing services, are growing in popularity as a means of meeting the demand of tourists for urban travel in the absence of sufficient public transportation in developing nations. As a result, ride-sharing has become a necessity in the Sri Lankan economy rather than just an alternative. Since no study in Sri Lanka has examined the tourists' perception regarding the use of ride-sharing services during their trips, the purpose of this research was to investigate the factors influencing tourists' satisfaction with ride-sharing services in Sri Lanka with special reference to the Colombo district. This study used a quantitative approach, and this research was carried out by using primary data collected through self-administered questionnaires. The convenience sampling method was used to select 385 individual tourists who are users of ride-sharing services of two main service providers in the Colombo district. Reliability was confirmed using Cronbach's alpha reliability test, and collected survey data were analyzed using descriptive statistical analysis and Pearson correlation coefficient. The results of the study verified that tourist satisfaction with ride-sharing services has a strong positive correlation with both digital experience and safety. Additionally, this study provided valuable managerial implications that can aid stakeholders, policymakers, and service providers in the transportation and tourism sectors in better meeting tourists' travel needs.

Keywords: Tourist Satisfaction, Digital Experience, Safety, Accessibility, Ride-sharing Services

CHALLENGES AND OPPORTUNITIES ON ADOPTING TOURIST INFORMATION KIOSKS IN CULTURAL TRIANGLE SRI LANKA: TOURISM STAKEHOLDERS' PERSPECTIVE.

H.P.M.S.K Jayaweera and A.M.D.B Nawarathne

Department of Tourism Studies, Uva Wellassa University of Sri Lanka
sudeshaneem310@gmail.com

Abstract: When new technologies are developed, new technologies and applications are created. The information kiosk is a popular technological technique. The tourist information kiosk was a popular and effective technological technique in travel and tourism. Several countries used tourist information kiosks (TIK) in their travel and tourism businesses. It was an emerging technology in the travel and tourism industry. Hence, the central focus of this study was to identify the existing usage of TIK in the Cultural Triangle and explore the challenges and opportunities of adopting Tourist Information Kiosks in the Cultural Triangle, Sri Lanka. The purposive sampling method was used to collect primary data from thirty (30) tourism stakeholders in the cultural triangle of Sri Lanka. In addition, a qualitative data analytical method was employed, and the collected data was transcribed and analyzed using content analysis. The study's findings revealed that there was a problem regarding the information provided to visitors in the cultural triangle. Also, tourist information kiosks are not used in Anuradhapura and Polonnaruwa. TIK were used in Knady, but it was not utilized correctly. Environmental issues, theft, unemployment, maintenance, and updates were challenges to adopting TIK in the Cultural Triangle. Stakeholder awareness, willingness, language barriers, and inexperienced employees were opportunities to adopt TIK in the cultural triangle of Sri Lanka. Further, updating and maintaining in a timely manner, considering physical access to TIK, the TIK content should be suitable for users, implementing TIK with cover to protect it from environmental issues helps maximize the TIK experience in the cultural triangle in Sri Lanka.

Keywords: Tourist Information Kiosks, Cultural Triangle, Tourism Stakeholders

PRELIMINARY STUDY ON THE BRAGADI THAILAYA OF THALPATHE PILIYAM FOR DARUNAKA

E.M.C. K Ekanayake, S.P.A.U.M Gunathilaka, K.A. I Amarasinghe, S.D.N.M Premathilaka, K.T.M Jayasinghe, K.M.M Sewwandi and P. Hewagamage

*University College of Ratmalana, University of Vocational Technology, Sri Lanka
chamilaekanayake@ucr.ac.lk*

Abstract: Darunaka is the most common skin disorder affecting the scalp. The most common age group is 20-30; females are more affected than males. It's characterized by scaling of the scalp, itching of the scalp, diffuse hair falling, and exudation of the scalp in Ayurveda. It's due to the vitiation of vata and kapha dosha. This disease has a high prevalence rate and frequent relapses. According to the pilot survey, Darunaka is found to affect 63% of people. Keeping all these facts in the background, the present preliminary study to cure Darunaka is Bragadi thaila. The study was conducted in 30 clinically diagnosed patients having classical signs and symptoms in Darunaka administered with Bragadi thailaya for 14 days. When considering the type of Prakriti, vata-kapha body temperament is more prominent than kapha-pitta and pitta-vata. According to the figures. There is a significant difference between scaling of the scalp, itching of the scalp, and diffuse hair falling before and after treatments. However, there is an insignificant before and after treatment of exudation. Ayurveda pharmacodynamics properties were analyzed in ingredients of Bragadi taila under Rasa, Guna, Virya, and Vipaka. They were dominant in Tikta, Kashaya, Katu rasa, Laghu, Ruksha in guna, Ushna in veerya and Katu vipaka. When considering swarasa dravya thiktha and kashaya rasa, laghu, theekshna and snigdha guna, sheetha veerya, katu vipaka are predominant. In Kalka dravya, thiktha, kashaya, katu rasas, laugh, ruksha, and theekshna guna, seetha veerya and katu vipaka are the most prominent pharmacodynamics properties. The main ingredients in this recipe were targeted at the pacification of Vata Dosha and Kapha Dosha. According to observations and results, it can be concluded that the drug shows highly significant results in almost all the classical signs and symptoms of Darunaka effectively.

Keywords: Darunaka, Bragadi thailaya.

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TECHNICAL SESSION 5

SUSTAINABLE PRACTICES FOR MULTIFUNCTIONAL GREEN ECONOMY

A REVIEW OF DEVELOPED LEAN CONSTRUCTION FRAMEWORKS IN THE SRI LANKAN CONTEXT

P.L. Perera, S. Kajewski, V. Coffey

*School of Architecture and Built Environment, Queensland University of Technology (QUT),
Brisbane, Australia
panapitikankanamalage.perera@hdr.qut.edu.au*

Abstract: There is a growing necessity to thoroughly review the developed lean construction frameworks within a Sri Lankan context because most of the developed frameworks in this country were introduced at a conceptual level and in a scattered diffused manner across various construction domains. Several scholars have underscored the lack of comprehensive frameworks encompassing the entire construction lifecycle and the absence of industry-validated processes in Sri Lanka from 2012 to 2018. After 2018, a few frameworks emerged, but they exhibit significant limitations, such as insufficient transparency, biases, and reliance on limited mono or bi-evidence case studies on lean tool implementation. This study aims to review existing lean construction frameworks developed from 2012 to 2024, identifying their benefits, shortcomings, issues, and limitations through a comprehensive literature review-based approach. As one of the pioneering review studies in this area, the summarized tabular framework demonstrates the drawbacks and loopholes while providing suggestions to overcome them. The outcomes provide new thinking perspectives for novel framework development that apply in Sri Lanka and other developing countries that share the same level of lean construction maturity and characteristics. This paper will be a foundation for determining future probable areas such as: cost overrun, time delays, quality issues, risk predictability, and stakeholder management to consider in lean construction framework development in the Sri Lankan context.

Keywords: Frameworks Review, Lean Construction, Sri Lanka.

TOWARDS THE DEVELOPMENT OF A SPECIFIC PROCUREMENT GUIDELINE FOR THE WATER SUPPLY SECTOR IN SRI LANKA

Sisilaksha M.D.N and Seneviratne S.R.M.P

Department of Quantity Surveying, University of Vocational Technology, Sri Lanka
nipunasisilaksha@gmail.com

Abstract: The National Water Supply and Development Board (NWSDB) is responsible for supplying pipe borne drinking water to nation of Sri Lanka. NWSDB uses National Procurement Agency guideline at water supply sector procurements. Thus, this practice is identified with perceived fundamental problems in implementing projects effectively and efficiently. This research discusses necessities of modifications for a specific procurement guideline for the water supply sector with key indices to address from the new procurement guideline. Objectives were achieved in the light of qualitative approach, done with a comprehensive literature review and followed by ten semi-structured interviews with the subject experts in the national water supply sector. The collected data were analyzed using the content analysis. This study has been initiated with a literature review in which (19) number of uniqueness variables of the water supply projects identified with eight (08) new variables national and international procurement guideline, addressed for improvements over proposed specific guideline. Twenty-one (21) numbers of problems & challenges in tender practice with Fifteen (15) new problem variables were identified. Twenty (20) numbers of problems were identified in existing procurement guideline with fourteen (14) new problem variables, attained at experts' interviews. Later theses uniqueness, problems & challenges in tender practice and problems in existing procurement guideline addressed for improvements for proposed specific guideline. Thus, findings have precisely pointed out the need of a specific procurement guideline for the water supply sector of Sri Lanka. Strategies listed out as indices, that to be addressed at a specific procurement guideline development.

Keywords: Procurement Guideline, Procurement, Water Supply.

INFORMAL CONSTRUCTION SECTOR IN SRI LANKA AND ITS EXISTING CHALLENGES: A WAY FORWARD FOR FORMALIZING

R. Thalpage, V. Srivishagan and G.V. Mahesh Silva

University College of Matara, University of Vocational Technology, Sri Lanka
rasanthithalpage@gmail.com

Abstract: The informal construction sector has been significantly expanded over past few years and most countries' economic growth including Sri Lanka is depending heavily on the informal sector. However, when compared with formal sector, informal sector has different characteristics and faced with several challenges as lack of awareness and knowledge, lack of enforcement, lack of direct regulations, no proper documentation path, lack of credibility and high irresponsibility, absence of standards and high costs of compliance. Thus, the purpose of this study is to recommend the probable approaches to enhance the formality of Sri Lankan informal construction sector by overcoming existing challenges. A mixed research approach was adopted for attaining the research aim while conducting questionnaire survey among 100 local professionals with 84 responses and 10 expert interviews who are in both contractor and consultant fields. The findings were analyzed with visual representations by Microsoft Excel and content analysis technique. Lack of awareness and knowledge and lack of enforcement were the highest ranked challenges faced by local informal construction sector. It was recommended to improve the knowledge on legal and formal procedures and to arrange awareness programs in rural and school level technology field. Informal sector must follow some legal procedures and the government enforcement and support is essential. They can initiate with a license system and proper documentation path. Trainings, microfinance, simplified regulations and market linkages can formalize the informal construction sector in Sri Lanka.

Keywords: Informal Construction, Challenges, Overcoming.

MITIGATE THE CONSEQUENCES ON CONTRACTOR'S PROFIT BY VARIATIONS AT RURAL DOMESTIC RESIDENTIAL CONSTRUCTION: CASE STUDY: SME CONSTRUCTION COMPANY OF SRI LANKA.

B.M.H. Jayathilaka, Chandana Jayalath and S.R. Muditha Seneviratne

Department of Quantity Surveying, University of Vocational Technology, Sri Lanka
qs20b205@uovt.ac.lk

Abstract: Variation orders are initiated for value analysis purposes to realize the balance between the cost, functionality, and durability aspects of a project and clients' satisfaction. Variations reduce costs and increase quality, and it is standard to optimize the client's benefits against the resource input by eliminating waste expenses. And other, projects with many variations cause contractors to achieve lower productivity levels. In the local context, especially in rural, scale contractors majorly involved with individual residential constructions, experience the changes of contracted design, as private clients tend to supplement with additional or deductive works at designs. Thus such situations cause a considerable amount of variations, then need to be planned and managed with strategies to manage with assumed profit margin. In this, it was studied the strategies to manage the variations to maintain the profit margin of SME contractors of residential unit constructions in Sri Lanka, in the light of qualitative study inputs. Accordingly, a case-study approach was carefully chosen instead of a SME construction company, managing a purposive sample for interviews (12) at a content analysis, to identify benefits, and strategies applied to manage the variation orders. The results highlighted as: Increasing the Profit & Overhead margin, claiming with a clear analysis of items rate breakdown, obtaining significant discounts from suppliers, and Negotiation with the client before stating variation work, with a proposal of way forward, contractor share considering the opinions of the client.

Keywords: Variation order, contractor, profit.

DETERMINATION OF NUTRITIONAL AND FUNCTIONAL PROPERTIES OF SRI LANKAN TRADITIONAL FERMENTED RICE

D.M.M.M Premarathna¹, Chathuni Jayathilake² and Malkanthi Thenabandu¹

¹*Department. of Agriculture and Food Technology University of Vocational Technology , Sri Lanka*

²*Department of Food Science and Technology, University of Sri Jayewardenepura, Sri Lanka
sankafernanz12@gmail.com*

Abstract: This study analyzed the nutritional and functional properties of Sri Lankan traditional fermented rice (Diya Bath), focusing on the impact of fermentation duration (8, 12, and 16 hours) on the proximate composition of three rice varieties: Red Rice (RR), Fragrant Rice (FR), and Raw Nadu (RN). The proximate analysis revealed specific trends. Ash content exhibited minor fluctuations, with FR increasing from 0.45% to 0.46%, while RN and RR showed marginal changes from 0.42% to 0.365% and 0.39% to 0.358%, respectively. Protein content was relatively stable, ranging from 2.1% to 2.5% across all varieties, with RN consistently exhibiting slightly higher levels. Crude fat content increased in FR and RN, reaching 11.3% and 13.2%, respectively, while RR decreased to 10.7%. Moisture content showed a significant decline across fermentation durations, with reductions from 29.8% (FR), 30.1% (RN), and 27.0% (RR) at 8 hours to 19.0%, 18.2%, and 19.9%, respectively, at 16 hours. Microbiological analysis highlighted RN as the most effective substrate for lactic acid fermentation, achieving the highest lactic acid bacteria (LAB) growth (7.3×10^7 cfu/g after 16 hours), while FR was the least suitable (5.3×10^7 cfu/g at 16 hours). ANOVA results confirmed significant variations in moisture content across the fermentation durations ($p < 0.001$), with the highest moisture content recorded at 8 hours, followed by 12 and 16 hours. Fermentation duration influences the proximate composition and microbial activity of rice varieties. RN rice is ideal for lactic acid fermentation, with potential for optimizing production. Future research should explore biochemical processes to improve the nutritional and functional qualities of fermented rice.

Keywords: Fermented rice, Fermentation duration, Lactic acid fermentation, Proximate analysis.

QUALITATIVE DETECTION OF ADULTERATION IN NON-LABELED CHILI AND TURMERIC POWDERS SOLD IN THE RETAIL MARKET IN THE MATARA CITY AREA

K. M. N. K. Sewwandi¹, P. Varunitha¹, D. M. S. H. Dissanayake¹ and J. M. C. M. Jayasekara²

¹*University College of Matara, University of Vocational Technology, Sri Lanka.*

²*Department of Food Science and Technology, University of Peradeniya, Sri Lanka.
chathurikaj@agri.pdn.ac.lk*

Abstract: The adulteration of spices is a current global issue. This study was conducted to qualitatively detect the level of adulteration in non-labeled chili and turmeric powders sold in the retail market in Matara City, Sri Lanka. Physical and chemical analyses were carried out on 60 randomly collected samples (30 each of chili and turmeric powders). Each sample weighed 40-50 g. Texture, colour and odour of each sample were assessed physically, while specific adulterants such as starch, artificial colours, sawdust and maaetanil yellow were identified through chemical tests. Moisture content was analyzed using a moisture analyzer. Foreign particles and starch adulteration were detected via microscopic observations. Control samples were prepared to match the SLS requirements and used as standards to guarantee accurate comparisons. Results revealed that turmeric powder samples were significantly pure, with 93.3% free from hazardous contaminants such as yellow lead salts and aniline dye. A considerable proportion of turmeric powder samples (10%) contained metanil yellow and starch. Chili powder samples exhibited greater adulteration rates, with 43.3% displaying physical adulteration and 23.3% containing artificial colouring. These findings emphasize the requirement of strict regulatory measures and quality control procedures to assure consumer safety and maintain product integrity in the spice market.

Keywords: Food Safety, Adulterants, Chili Powder, Turmeric Powder, Qualitative Measures

DEVELOPMENT OF SPREADABLE CREAMED COCONUT (COCONUT SPREAD)

Dasanayaka U.P.A.L. and Yogapratish.V.

Department of R&D, Manchiee De Coco Products, Srilanka.

yogapirathis2501@gmail.com

Abstract: Creamed coconut is unsweetened dehydrated fresh meat of a mature coconut, ground into a semi-solid white creamed coconut (coconut butter). Commercially available coconut butter has been separated as the whole coconut meat and oil according to their density as the top layer, and other solids were separated hardly in the bottom side within a few days. That was a major defect, which can lead to consumer dissatisfaction. Therefore, this study focused on finding the solution by improving the formula and enhancing the spreadability. In the preliminary research, the mixer used creamed coconut, reprocessed coconut milk powder (RPCMP), maltodextrin (MD), coconut flour (CF), and low-fat desiccated coconut (LFDC). The layer separation was detected with different formulas used above ingredients and proportions were made as M1=(55:24:7:7:7), M2 = (55:28:7:6:4), and M3 = (55:32:7:3:3), respectively. Organoleptic properties and overall acceptability were evaluated in creamed coconut samples separately using twenty (20) semi-trained panelists with a five (5) point hedonic scale and selected the best sample with higher consumer acceptance. Selected creamed coconut samples and control sample (M4) (commercially available) analysed for proximate composition and microbial analysis by using standard methods (AOAC). Sensory evaluation revealed that creamed coconut from the M3 formula (55:32:7:3:3) scored higher in the sum of ranks than the M1 and M2 for almost all the sensory attributes and overall acceptability. Results of the proximate analysis were reported 1.3% moisture, 4% protein, 29.78 fat, brix value 58, and 602.3 viscosity. Creamed coconut has a low moisture content and microbial stability was tested over 18 months. Therefore, it could be said that this product has a long shelf life.

Keywords: Spreadable creamed coconut, Layer separation.

CONSUMER ACCEPTABILITY OF CEYLON DATE PALM FRUIT INCORPORATED ALCOHOLIC BEVERAGE

I.P.D.P.D. Samanthilaka, W.A.C.H. Wijayathilaka and
M.L.P. Thathsarani

Department of Agriculture & Food Technology, University of Vocational
Technology, Sri Lanka
pasindu05dilshan@gmail.com

Abstract. The fruit of the Ceylon Date palm (*Phoenix pusilla*), a member of the Arecaceae family, is extensively grown in southern India and Sri Lanka. This tropical fruit has a lot of promise for value-added goods because of its unique flavor profile, bioactive components, and rich nutraceuticals qualities. A study was conducted using an online survey to assess consumer acceptance of new products derived from the Ceylon Date palm. The survey included 100 participants, randomly selected and stratified by age, gender, and education level. The majority of participants (94.1%) were found to be between the ages of 20 and 24. The results showed a strong preference for an alcoholic beverage among the proposed products. Thus, two alcoholic beverage formulations (F1 and F2) based on Ceylon Date palm were developed. The beverage samples were subjected to physicochemical analysis and sensory evaluations. Using a 5-point hedonic scale, 30 semi-trained panelists assessed the samples as part of the sensory acceptability test. The F1 and F2 formulations scored identically for texture and odor, but the F2 formulation, which contained 60% Ceylon Date palm fruit, received the highest ratings for appearance, color, and taste, with a hedonic score of 4.500 ± 0.1 for the overall acceptability. The selected F2 sample (100 ml) revealed a pH of 5.5 ± 0.02 , a Brix value of $20\% \pm 0.05$, and an alcohol level of $8\% \pm 0.05$, based on physicochemical analysis. In conclusion, the unique flavor and health advantages of the Ceylon Date palm-based alcoholic beverage make it a promising product for both local and international markets.

Keywords: Ceylon Date palm, Alcoholic beverage, Consumer acceptability

DEVELOPMENT AND CHARACTERIZATION OF A CORIANDER LEAF AND GREEN CHILI-BASED CULINARY SAUCE

P. Anusha, S. Danushan and P. Karthiha

*University College of Jaffna, University of Vocational Technology, Jaffna, Sri Lanka
anushaqn20@gmail.com*

Abstract: Sauces are versatile liquid or semi-liquid foods, with a growing market driven by consumer demands for safety, nutrition, flavour, and adaptability. The fast-food industry's demand for spice pastes and purees has fuelled this expansion. Fresh coriander leaves spoil quickly and need immediate processing or preservation. Purees and pastes provide a convenient way to retain the colour and flavour of fresh ingredients in a semi-solid form. This research aims to develop a sauce product primarily composed of coriander leaves and green chilies, focusing on evaluating the chemical and sensory qualities of the final product while optimizing ingredient ratios and processing methods. Sauces were prepared by using the coriander leaves and green chili in the ratio T1 (100%:0%), T2 (90%:10%), T3(80%:20%), and T4 (70%:30%). A 5-point hedonic scale was used for the sensory evaluation of sauce for attributes such as appearance, colour, taste, smell, spiciness, and consistency using 32 semi-trained panellists. Based on the sensory assessment, 80% coriander leaves and 20% green chili incorporated formula (T3) was selected as the best sample. Chemical analysis of the treatment chosen revealed the following characteristics: moisture content (wet basis) - 82.19%, ash content - 2.39%, pH - 5.03, protein content - 2.39%, and total soluble solids - 13.69%. Consequently, the coriander-incorporated chili sauce was preferred by the panellists.

Keywords: Sauce, Coriander, Chili.

DEVELOPMENT AND EVALUATION OF A READY-TO-EAT KETOGENIC BAR: FORMULATION, NUTRITIONAL COMPOSITION, SENSORY PROPERTIES

Yasinta K.W, Pasan A.J.R. and P, Kumari E. M S.H

University College of Matara, University of Vocational Technology, Sri Lanka
wikyasantha@ucm.ac.lk

Abstract: In this study, a ready-to-eat ketogenic bar that was specially made to meet the dietary needs of people on a ketogenic diet was designed and thoroughly evaluated. Creating many formulations was part of the first step, which aimed to match the high-fat, low-carb requirements needed to maintain ketosis with the sensory aspects that mattered most to consumers. Out of all these formulations, two were chosen for a thorough sensory analysis, in which characteristics including flavor, consistency, and general acceptability were evaluated thoroughly. The combination of 52% almond flour, 30% desiccated coconut, 3% coconut flour, 4% cashew nuts, 5% peanuts, 3% dark chocolate, 1% vanilla extract, and 2% virgin coconut oil were shown to be the most effective. Potential customers found this specific combination to be the most enticing due to its exceptional sensory qualities. After being chosen, this formulation was subjected to a thorough nutritional analysis to confirm that it was appropriate for a ketogenic diet. Amount of 54.6% of the sample was found to be fat, which is in line with the ketogenic diet's objective of consuming as much fat as possible for energy. Furthermore, the protein content was found to be 15.76%, offering a moderate yet necessary amount of protein required for maintaining muscle mass and general health.

Key words: Ketogenic bar, Ready- to- eat, Nutritional, Health

INGREDIENT SHELF-LIFE MANAGEMENT AND SAFETY: A CASE STUDY OF CINNAMON HOTELS AND RESORTS

**A.S.J. Chandimal¹, G.M. Somaratne¹, Y.D.M.D.C.Y. Bandara²,
M.A. Samarasekara² and N.M.A.I. Nikalansooriya¹**

¹*Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya, Sri Lanka*

²*Cinnamon Hotels and Resorts, Sri Lanka*

E-mail-ayeshanikalansooriya95@gmail.com

Abstract: This research explores innovative approaches to managing the shelf-life and safety of culinary ingredients at Cinnamon Hotels and Resorts, a leading food service provider in Sri Lanka. The study addresses the critical need for sustainable practices in the food service industry by focusing on reducing waste, enhancing food safety, and optimizing resource use. Cinnamon Hotels and Resorts handles a diverse range of up to 2,500 food ingredients daily. Due to a lack of harmonized information regarding ingredient shelf life and storage, this high volume of ingredient turnover presents challenges to chefs related to quality control, spoilage, and microbial safety. By developing a comprehensive guidebook and a custom-built electronic database, this research introduces sustainable practices that enhance ingredient shelf-life management and reduce food waste. Initial insights were gathered through focus group discussions with industry experts at the hotel. Based on this input, all culinary ingredients were divided into 12 major categories according to origin, compiling information on shelf-life, secondary shelf-life, storage conditions, perishability, modes of spoilage, and allergenicity. The research integrates shelf-life and related data, which is partly based on published international research on Scopus, Pub-Med, Web of Science, and Google Scholar. It was partly based on hands-on experience and inputs from chefs and key stakeholders engaged in the quality and safety aspects of Cinnamon Hotels and Resorts. The research yields a guidebook (ISBN: 9786245887002) and a custom-made electronic database to assist chefs in handling food ingredients. It establishes standardized procedures for food safety, which enhances industry efficiency and contributes to economic growth.

Keywords: Allergenicity, Culinary ingredients, Food safety, Secondary shelf-life, Product freshness control..

DEVELOPMENT OF CHOCOLATE ALTERNATIVE USING AVOCADO SEED (*PERSEA AMERICANA*) – A REVIEW

A. D. M. P. Dissanayake and U.A.S.K. Edirisinghe

*Department of Agriculture & Food Technology, University of Vocational Technology, Sri Lanka
fpt18b121@uovt.ac.lk*

Abstract: With increasing consumer demand for sustainable and health-conscious food options, there is a growing interest in finding alternative ingredients to replace traditional ones. Avocado seeds, often regarded as waste, present a promising opportunity due to their unique nutritional and functional properties. This review explores the potential of avocado seeds (*Persea Americana*) as a novel substitute for cocoa in chocolate production. It examines the nutritional benefits of avocado seeds, highlighting their high fiber content and bioactive compounds that could contribute to a healthier chocolate alternative. The review also discusses the various processing methods required to transform avocado seeds into a viable chocolate product, including techniques to address their inherent bitterness and achieve desirable texture and flavor. Furthermore, it assesses the sensory characteristics of avocado seed-based chocolate and its market feasibility compared to traditional chocolate. Challenges in production and consumer acceptance are addressed, along with future research directions for advancing this innovative approach. Overall, the review provides a comprehensive overview of avocado seeds as an eco-friendly and nutritious alternative in the chocolate industry.

Keywords: Avocado Seed, Chocolate Alternative, Innovation, Sustainable, Nutrition

EXPLORING FAST FOOD CONSUMPTION PATTERNS AND PREFERENCES AMONG UNIVERSITY STUDENTS IN COLOMBO, SRI LANKA

P.A.H. Madushani¹, Malkanthi Thenabadu¹ and D.V. Durga Sajeevani ²

¹Department of Agriculture and Food Technology, University of Vocational Technology, Sri Lanka

²Department of Electro-Mechanical Technology, University of Vocational Technology, Sri Lanka
thenabadu@uovt.ac.lk

Abstract: This study investigates the fast-food consumption behaviors, attitudes, and preferences of students in a Vocational University, Colombo, Sri Lanka. The research focuses on the weekday cohort, consisting of 450 students, with a convenient sample of 100 students. Data was collected through an online questionnaire, covering demographics, fast food consumption patterns, and attitudes toward fast food. The analysis was conducted using descriptive statistics. The respondents were principally male (62%), with mean BMI values of 21.9 for males and 20.5 for females, and average waist measurements of 81 cm for males and 76 cm for females. The findings reveal that 54% of students consume fast food daily, with 21% indulging in fast foods more than once a day. An additional 46% reported occasional fast-food consumption. The study highlights the significant role of fast food in the daily lives of students, with 69% maintaining normal BMI. Gender differences were observed, underscoring the need for targeted interventions. The study highlights taste as the primary driver of fast-food consumption, with convenience and affordability also emerging as significant factors. Notably, 86% of respondents strongly agreed that fast food is more economical than restaurant meals. These findings offer valuable insights into fast food consumption patterns, attitudes, and their implications for nutritional status enabling suitable interventions to promote healthier dietary choices among university students.

Keywords: Fast food consumption, University students, Dietary habits, Sri Lanka.

PILOT STUDY: QUANTITATIVE ASSESSMENT OF HOUSEHOLD COPING STRATEGIES IN RESPONSE TO FOOD INSECURITY IN URBAN COASTAL VILLAGES OF SRI LANKA

Malkanthi Thenabandu¹, M.A.J. Wansapala²

¹Department of Agriculture and Food Technology, University of Vocational Technology, Sri Lanka

²Department of Food Science and Technology, University of Sri Jayewardenepura, Sri Lanka

m.thenabandu@uovt.ac.lk

Abstract: The aim of this study is to investigate Coping strategies used by food insecure households in urban coastal villages in Moratuwa municipality, in Colombo district, Western province in Sri Lanka. The study employed cross sectional survey to gather data on household demographics, food-related coping strategies and non-food-related coping strategies from 46 households. The Coping Strategies Index (CSI) score was calculated for each household to quantify the severity of food insecurity. The study investigates the links between commonly utilized coping techniques as well. Data analysis shows that the most commonly used strategies include relying on less desired and less expensive food, purchasing on credit, and lowering meal quantities. The Coping Strategies Index (CSI) score revealed substantial levels of food insecurity among tested households. The questionnaire's reliability analysis revealed high internal consistency, with Cronbach's Alpha scores ranging from 0.68 to 0.85 across parts. Correlation study found moderately favorable associations between several coping strategies, such as reducing meal size and number of meals per day. However, regression analysis did not reveal robust linkages for strategies. These findings underline the complexity of food insecurity in urban coastal areas, where households employ several interconnected strategies to cope with limited resources. Future studies should examine other factors that impact coping practices, such as social capital and community support networks, to create more effective interventions.

Keywords: Food Insecurity, Coping Strategies Index (CSI), Coastal Households, Sri Lanka

DEVELOPMENT OF CASSAVA CAKE WITH CARROT JAM

Thurairaj Priyanka Dilrukshi & Ashok Kumar Usha Nandhani

University College of Jaffna, University of Vocational Technology, Sri Lanka
priyankadilrukshidayagama123@gmail.com

Abstract: Cassava is a calorie-rich vegetable that contains plenty of carbohydrates and key vitamins and minerals. It may boosts a person's gut health by helping nurture beneficial gut bacteria, helps to reduce inflammation and promote digestive health and helps to reduce inflammation and promote digestive health. It also improves metabolic health, reduce the risk of obesity and type 2 diabetes and improve blood sugar management. The aim of this study was to investigate the potential of two types of food: the first one is cassava cake to reduce the gluten percentage in cake and second one is carrot jam to increase the nutrition value of jam by using vegetable (carrot pulp 65%, sugar 35%) Initially the cassava was dried in dehydrator for 4 hours at 600°C (1400F) and was ground into flour. Then three trials with control were carried out to find out the best combination of composite flour mixture. Three levels 100%, 80%, and 60% of cassava flour was incorporated with cake and 0% control. Each cake was filled with carrot jam layer. Appearance, Aroma, Color, Taste, Softness, and Sweetness were evaluated as sensory attributes using 5 points hedonic scales by untrained panel of 50 members. After carrying out the sensory evaluation on four treatments 80% cassava flour cake with carrot jam was selected as the most preferred sample. For the selected sample proximate analysis, moisture content, ash content, fat content, protein and brix were evaluated. Moisture 10.90%, ash 1.53%, fat 19.97%, protein 5.28 and brix 69.83 was observed for the selected sample. At last, the cassava flour incorporated cake did not negatively affect the cake properties. Therefore, cassava flour incorporated cake can be recommended for consumption.

Keywords: Bakery product, Cake, Jam, Cassava, Carrot, Gluten.

DEVELOPMENT OF ORGANIC CHEMICAL FREE VARNISH FROM CASHEW NUT SHELL LIQUID

M. R. F. Saneefa¹, M. J. M. Fari¹ and T. D. C. M. K. Wijayasiriwardena²

¹Department of Bio Systems Technology, South Eastern University of SriLanka, SriLanka

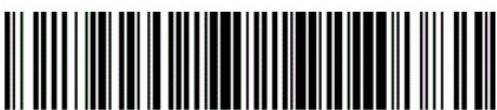
²Department of Techno Entrepreneurship Manufacturing & Logistic Management, Industrial Technology Institute, Sri Lanka
drchandima@iti.lk

Abstract: Cashew Nut Shell Liquid (CNSL) is a renewable and versatile natural product derived from the shells of cashew nuts, which is underutilized in Sri Lanka. Market available varnishes are comprised of organic chemicals that are harmful to human health. In contrast, naturally derived products will have better market acceptance. Cashew nut shells were collected from Wanathavilliwa of Puttalam district and Eravur of Batticaloa district in the month of June 2024. Shells were powdered and stored in high density polyethylene container until use for extractions. 1kg of shell powder was extracted with methanol in Soxhlet apparatus for 6 hours, the extraction solvent was recovered and the yield of CNSL was measured. The extracted CNSL was treated with calcium hydroxide at ambient temperature to produce limed-CNSL product. This product was used to formulate oleoresinous varnish using double-boiled linseed oil. Vegetable turpentine oil is used as a solvent. The varnish produced was subjected to analysis per the Indian Standard (IS) 525-1986 and other scientific data to evaluate their performance. Acid value 2.5, flash point 26°C, specific gravity 0.981, density 0.97 g/cm³, viscosity at 30°C 28.5 cP, refractive index at 25°C 1.33, Various stages of drying were determined as per ASTM D1640/D1640M-14 (2022); however, the sample was taken 72 hours. Results proved that the varnish complied with IS requirements. However, it exhibited lower drying property. The study highlights the use of CNSL as a key ingredient in the development of sustainable and environmentally friendly industrial products in the manufacturing of organic chemical free varnish. The successful development of CNSL-based varnish opens opportunities for further development, reducing reliance on synthetic chemicals and improving environmental sustainability in industrial coatings and varnishes.

Keywords: CNSL, Indian standard, Varnish



University of Vocational Technology
No. 100, Kandawala, Rathmalana.
0112-630700
www.uovt.ac.lk



ISSN 2602-8778