UNIVERSITI TEKNOLOGI MARA

I-CReST

INTERNATIONAL CONFERENCE ON RESEARCH AND PRACTICES IN SCIENCE, TECHNOLOGY AND SOCIAL SCIENCES

LEVERAGING TECHNOLOGICAL ADVANCES AND MULTIDISCIPLINARY RESEARCH FOR A SUSTAINABLE FUTURE IN EDUCATION

ABSTRACT BOOK

UNIVERSITI TEKNOLOGI MARA
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I-CReST 2023 International Conference on Research and Practices in Science, Technology and Social Sciences: ABSTRACT BOOK/
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PREFACE

Assalamu'alaikum warahmatullahi wabarakatuh and greetings.

A warm welcome to this esteemed gathering of academicians, industry players, researchers, graduate students and all participants at the 4th [Virtual] International Conference on Research and Practices in Science, Technology and Social Sciences (I-CReST) 2023. The theme, "Leveraging Technological Advances and Multidisciplinary Research for a Sustainable Future in Education" provides us a path to embark on a journey of exploring a myriad of opportunities and possibilities for impactful academic sharing and networking. Such connectivity paves the way to transforming education through advances in technology, and providing overall enriching teaching and learning experiences for everyone in academia. The theme demonstrates our aspiration to make the best out of technological advances in empowering and making education more sustainable through collaborations in interrelated areas of expertise among scholars across various geographical settings. Education, particularly at institutions of higher learning, has been constantly revolutionised through the emergence of technology, changing its landscape rapidly into one that transcends beyond the physical boundaries. Leveraging technological advances, I-CReST enables us to come together for meaningful academic discourses and sharing of research findings and ideas.

This year's conference is even more meaningful for all of us at the Centre of Foundation Studies UiTM Selangor Branch Campus Dengkil, as this online academic gathering is made possible through the collaboration with the Ibnu Sina Institute for Scientific and Industrial Research (ISI-SIR), Universiti Teknologi Malaysia (UTM). With a total of 235 abstracts and presentations of research work, the overwhelming responses that I-CReST has received is a testimony of the trust granted to us by the participants within and beyond Malaysia. To add to this, this virtual conference has the support from the Malaysian Zeolite Association (MyZA), with the provision of special awards as a recognition for the research work dedicated to zeolites and inorganic materials.

I would like to extend my utmost gratitude to the Director of the Centre of Foundation Studies, Professor Ir. Dr. Ahmad Farid Abidin, Ibnu Sina Institute for Scientific and Industrial Research, Malaysian Zeolite Association (MyZA), all participants, and especially to the ever-committed I-CReST 2023 Organising Committee, for the undivided support, hard work and contributions to make this conference an impactful and successful one.

Finally, on behalf of the I-CReST 2023 Organising Committee, thank you and welcome! Insha Allah, see you next year in I-CReST 2024.

Dr Fadiatul Hasinah Muhammad
Chairperson
I-CReST 2023

FOREWORD

Assalamu'alaikum warahmatullahi wabarakatuh and greetings

It is a pleasure for us at the Centre of Foundation Studies, UiTM Selangor Branch Dengkil Campus, to welcome all esteemed members from diverse institutions to the 4th [Virtual] International Conference on Research and Practices in Science, Technology and Social Sciences (I-CReST) 2023. It is a privilege to have an array of experts from different backgrounds to collectively realise the conference's theme this year, "Leveraging Technological Advances and Multidisciplinary Research for a Sustainable Future in Education". This book of abstracts is one of the many clear manifestations of the unyielding efforts by everyone involved in I-CReST 2023.

In today's fast-evolving world, technological advancements such as interactive online platforms, virtual reality, and artificial intelligence are becoming a norm to improve accessibility and engagement in education. On a related note, the inseparability between education and research of different backgrounds means that multidisciplinary research can drive more collaborative and useful initiatives. Such initiatives have the potential to create solutions that better equip all the stakeholders with critical thinking and problem-solving skills to address growing global issues within and beyond the education world. By harnessing the power of both technology and multidisciplinary research, a more sustainable future in education can be realised. In short, the theme of I-CReST 2023 - Leveraging Technological Advances and Multidisciplinary Research for a Sustainable Future in Education - is not an elusive dream, but an attainable goal. The organisation of this conference can be the catalyst to turn this goal into reality.

I would like to express my heartfelt gratitude to the dedicated reviewers whose effort made it possible for the high-quality abstracts and manuscripts to be published, not only in I-CReST 2023 proceedings but also in the chosen established academic journals. The extensive work of the conference's committee members, headed by Dr. Fadiatul Hasinah Muhammad, should also be immensely applauded. I sincerely wish that everyone will find I-CReST 2023 a productive setting in materialising one's individual, institutional, national and global goals in education.

All the best and insya Allah, I am confident that I-CReST 2023 has already yielded fruitful outcomes and will continue to create more in the future.

Thank you.

Professor Ir Dr. Ahmad Farid Abidin @ Bharun
Director
Centre of Foundation Studies
Universiti Teknologi MARA (UiTM)
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ABOUT THE CONFERENCE

The International Conference on Research and Practices in Science, Technology and Social Sciences (I-CReST) is an annual event organised by the Centre of Foundation Studies, Universiti Teknologi MARA (UiTM), Selangor Branch Dengkil Campus, Malaysia. With this year's theme, "Leveraging Technological Advances and Multidisciplinary Research for a Sustainable Future in Education", it aims to provide a constructive virtual avenue for researchers and scholars across the globe to network with each other via the presentation of their impactful research works. The conference focuses on providing a platform for the dissemination of research findings and intellectual discussions on diverse topics relating to utilising technological advances in empowering and making education more sustainable through collaborations in interrelated areas. This conference has a typical format of 20-40 minutes of sharings or presentations by plenary and keynote speakers, as well as invited presenters, who are experts in their respective fields. The slots are subsequently followed by the Q&A or discussion session. This conference has also made it possible for more presentations in the form of pre-recorded videos that are streamed via YouTube, thus promoting more academic engagement. Since its inaugural event in 2020, I-CReST has received tremendous positive responses from participants of various educational and industrial backgrounds. I-CReST 2023 garnered around 235 abstracts and presentations on cutting-edge topics within the scopes of science, technology and social sciences, as well as those of cross-disciplinary nature. The conference also provides opportunities for publication in proceedings with e-ISBN. Selected papers will be considered for publication in journals indexed by WOS/Scopus/MyCite/MyJournal after a thorough peer reviewed process.

THEME SYNOPSIS

I-CReST 2023's main theme addresses **FOUR** (4) tracks to encourage scientific writing/publication across multidisciplinary research in the broad fields of the following.

Physical Sciences:
Medical Physics; Nuclear Physics; Photonics; Optics; Spectroscopy; Device Physics; Material Science; Polymers; Nanotechnology; Solid State Ionics; Inorganic and Organic Chemistry; Natural Products Chemistry; Catalysis; Renewable and Sustainable Energy

Biological Sciences:
Botany; Forestry; Ecology; Zoology; Entomology; Microbiology; Biotechnology; Genetics; Bioinformatics; Nutraceutical; Cosmeceutical; Pharmaceutical; Pharmacology; Biomedicine; Health Sciences

Information Technology, Engineering and Mathematics
Human-Computer Interaction; Information Virtualization; Modelling and Simulation; Computer Security; Wireless and Mobile Communications; Software Engineering; Internet of Things; Data Analytics; Multimedia Computing; Information Retrieval; Electronic Learning; Artificial Intelligence and Machine Learning; Web Technology; Pure and Applied Mathematics; Mathematics Education; Mathematical Modelling; Mathematical Statistics; Fuzzy Mathematics and Applications; Operations Research

Social Sciences & Humanities
Education/Pedagogy; Communication Arts; Information Communication; Linguistics/Neurolinguistics/Sociolinguistics; Literature and Poetry; Educational Management and Leadership; Early Childhood Education; Panicgogy; Civil Law; Economics and Financial Law; Human Right Law; Public Law; Islamic Law; Contract Law; Consumer Law; Comparative Law; Commercial Law; Competition Law; Constitutional Law; Environmental Law; Family Law

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Career Advancement as an Academician in a Dynamic and Innovative University

[1,2]Taufiq Yap Yun Hin

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ABTRACT

Globalization and internationalization of universities trend drive the higher education system to become more dynamic and innovative. Most of the current top universities vision is to be a world-leading not only in educationally alone but also in research at the highest international levels of excellence. A lecturer or academic staff as the greatest asset of the university playing an important role that will drives and encourages university competitiveness. A lecturer should both be a good teacher as well as a researcher with updated and broaden knowledge. At the same time, the university should also facilitate and provide encouragement of career development for the lecturers in their institutions. In this lecture, I will share the challenges and motivation as an academician in higher education institution.

BIOGRAPHY

Professor Datuk ChM. Ts. Dr. Taufiq Yap Yun Hin was born in Kota Kinabalu, Sabah on 14th January 1968. He earned his BSc (Hons) and MSc in 1992 and 1994, respectively at Universiti Putra Malaysia. He then went on to earn his PhD (1997) in heterogeneous catalysis at University of Manchester Institute of Science and Technology (UMIST), United Kingdom. Professor Taufiq-Yap started his career as a tutor in July 1993 and then lecturer at the Department of Chemistry, Universiti Putra Malaysia (UPM) since August 1997. He was promoted to Associate Professor on 1st May 2002 and to full professor on 1st October 2007. He was the founding Head of Catalysis Science and Technology Research Centre (PutraCAT) from 1st Sept 2008 until Sept 2014. Professor Taufiq-Yap was appointed as Vice Chancellor of Universiti Malaysia Sabah from July 2019 - July 2022. His research interest lies in the catalytic production of bioenergy from biomass and wastes. He published more than 460 Scopus indexed scientific publications includes various reviews on biodiesel and hydrogen production. Throughout his career, Professor Taufiq- Yap has been the recipient of the following Awards and Distinctions: National Young Scientist Award (2002); The Outstanding Young Malaysian Award (2008), Top Research Scientist Malaysia (2013), Malaysia's Research STAR Award (2018) and listed as World's Top 2% Scientist by Stanford University, USA. He received the highest award Gold Medal for Excellent in Chemistry 2022 from Malaysia Institute of Chemistry. Professor Taufiq-Yap was appointed as Fellow of Academy Science of Malaysia (2015), Fellow, Malaysia Institute of Chemistry (2009) and Fellow, Royal Society of Chemistry, United Kingdom (2008); He is currently the Visiting Professor of Henan Agriculture University, China (2020-2025) and Executive Council Member of Asia-Pacific Association of Catalysis Society (APACS).

KEYNOTE SPEAKERS (SCIENCE & TECHNOLOGY)

Metal Oxide-based Semiconductor for Humidity Sensor Applications

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ABSTRACT

The word humidity stands for the water vapor content in gases and are essential in everyday life where maintaining the suitable humidity level in the atmosphere improves agriculture, health, and quality of life. Fabrication of polymer material-based humidity sensors cause poor stability in highly humid environment and less sensitivity. Due to the poor adhesion and toxic solvent, polymer is not the sustainable materials for new humidity sensors. The fabrication process also involved hazardous materials which is harmful to the environment. Commonly used sensing materials in fabricating humidity sensors are metal oxide semiconductors, particularly titanium dioxide (TiO_2), due to their unique properties and excellent performance when applied to devices. TiO_2 semiconductors are chemically stable at ambient temperature. Moreover, compared to organic materials substitution, metal oxides semiconductor not only has higher advantages in terms of producing higher quality humidity sensing device, but it can also be easily synthesized at much lower production cost. Therefore, our study will be focusing on the optimization of humidity sensor from Nb-doped TiO_2 nanotube arrays (NTO) films via electrochemical cathodization method. Field emission scanning electron microscope (FESEM) images showed uniformly distributed TiO_2 nanos with a diameter ranging from 30 to 48.9 nm and length ranging between 0.4 to 1.82 µm. XRD results also showed that these materials have high crystalline structures. The fabricated NTO films based humidity sensor showed the highest sensitivity of 258.63 at 90 %RH, exhibiting ultra-sensitive, high stability and faster response. Detail of the fabrication process and device performance will be presented.

Keywords: Metal-oxide semiconductor; Electrochemical; Sensing application; Humidity sensor

KEYNOTE SPEAKERS (SOCIAL SCIENCES)

Human Rights and Rights to Education: Role of Human Rights Commission of Malaysia (SUHAKAM)

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ABSTRACT

The General Comment No13 of the International Covenant on Economic, Social and Cultural Rights (ICESCR) defines human rights and rights to education as "Education is both a human right in itself and an indispensable means of realizing other human rights. As an empowerment right, education is the primary vehicle by which economically and socially marginalized adults and children can lift themselves out of poverty and obtain the means to participate fully in their communities. Education has a vital role in empowering women, safeguarding children from exploitative and hazardous labour and sexual exploitation, promoting human rights and democracy, protecting the environment, and controlling population growth. Increasingly, education is recognized as one of the best financial investments States can make. But the importance of education is not just practical: a well-educated, enlightened and active mind, able to wander freely and widely, is one of the joys and rewards of human existence." The International Covenant on Economic, Social and Cultural Rights (ICESCR) devotes two articles to the right to education, articles 13 and 14. Article 13, the longest provision in the Covenant, is the most wide-ranging and comprehensive article on the right to education in international human rights law. Apart from ICESCR, the Convention on the Right of the Child (CRC) focuses on the right to education in two articles namely article 28 and 29. It is a child's human right to receive education and education is the key to the child's future. This paper will discuss the human rights to education and highlight the role played by the Malaysian Human Right Commission in enhancing children's rights to education by promoting human rights in Malaysia.

INVITED SPEAKERS (SCIENCE & TECHNOLOGY)

Mathematical Programming Models and Response Time Optimization of Ambulance Routing and Location-Allocation Problems – A Review

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ABSTRACT

Ambulance services play critical role in ensuring patients receive necessary prehospital care during emergencies. Ambulance response time (ART), which is the time taken from the time emergency call was received until an ambulance and paramedics arrive at the emergency site, has been used as a standard key performance indicator in measuring the emergency medical services (EMS). Reducing ambulance response time could save lives. However, minimizing ambulance response time is challenging due to many factors that could affect ambulance response time including accurate information, time and location of emergency, ambulance location and allocation, ambulance availability and accessibility, ambulance team and deployment, and decision on route to location. Many researches have been carried out in which mathematical programming (MP) models were employed widely in solving ambulance services related problems for optimizing the ambulance response time. This paper presents the thematic review of past studies concerning the MP models developed in terms of classification of problems, types of models, decision variables and solution methods. Results are discussed based on the effects towards reducing the ambulance response time. The objective of this paper is to provide an overview of the various characteristics of MP models and approaches used for optimization. This paper could provide basic understanding and gaps in research concerning ambulance response time optimization.

Keywords: Emergency medical services; Response time; Ambulance routing; Mathematical programming models; Optimization.

IoT for Education Sustainability: Utilizing Beacon Technology in Mobile Based Attendance System

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ABSTRACT

The integration of Internet of Things (IoT) technologies in various domains has revolutionized the way we interact with the world. In the field of education, IoT holds tremendous potential to enhance sustainability and efficiency. This research presents the utilization of beacon technology within a mobile-based attendance system. Beacon devices are small sensors that transmit signals to nearby mobile devices, enabling proximity-based interactions. By implementing a mobile-based attendance system powered by beacon technology, educational institutions can automate attendance tracking, reduce paper consumption, and administrative overhead. The system provides real-time attendance updates, minimizes errors, and generates valuable attendance data for analysis. Additionally, it promotes sustainability by eliminating paper-based attendance sheets and saving instructional time. However, challenges such as data security, technical issues, and user training need to be addressed. Potentially, integrating beacon technology within a mobile-based attendance system offers a more efficient, environmentally friendly, and data-driven approach to attendance management in education.

Artificial Intelligence and Personalized Learning

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ABSTRACT

AI is swiftly reshaping educational landscapes, enabling more personalised and impactful learning experiences. This paper will explore the transformative role of AI in fostering personalised learning, highlighting a pivotal shift from traditional one-size-fits-all approaches to individualised, learner-centric models. It will begin with an examination of the fundamental principles of personalised learning, emphasising its significance in modern education. It will explore how AI systems can efficiently analyse vast quantities of student data to comprehend individual learning patterns, identify areas for improvement, and design personalised learning experiences. In addition, the presentation will cover real-world applications of AI-enabled personalised learning. We will describe successful case studies from a variety of educational settings that demonstrate the profound impact of AI on student engagement and learning outcomes. While we celebrate the benefits of AI-powered personalization in education, we will also face the challenges that accompany it. Among these are addressing data privacy concerns, ensuring an adequate digital infrastructure, and facilitating effective teacher training to integrate AI into existing educational frameworks. The paper will conclude by extrapolating on the continued evolution of AI in personalising education, including potential advancements such as more refined AI algorithms, extensive classroom AI integration, and extensive AI application in curriculum design. As we enter this exciting new era of AI-driven personalised learning, this paper aims to inspire educators, researchers, and policymakers to fully harness AI's transformative power in creating individualised educational pathways, thus unlocking the potential of every student.

Keywords: Artificial intelligence; Education; Personalised learning; Higher education

Continuous-flow Pentafluoroalkylation using HFCs

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ABSTRACT

Hydrofluorocarbons (HFCs) have been used as cooling agents in refrigerators, air conditioning, and as solvent in industrial processes. HFCs are greenhouse gases, but the use of HFCs has been prohibited because of their high global warming potential. Therefore, development of effective and economical methods for reducing and reusing methods are highly required. The transformation reactions of HFCs as a fluorine source have been widely developed. The trifluoromethylation by using HFC-23 (fluoroform, HCF_3) and pentafluoroethylation by using HFC-125 (pentafluoroethane, HC_2F_5) have been studied. Considering industrial applications, continuous-flow technology is one of the suitable method. Thus, flow-perfluoroalkylation using HFCs have received highly attention. We herein report the continuous-flow perfluoroalkylation using HFC-125. Based on our previous reports, we optimized the reaction condition of flow-pentafluoroethylation using HFC-125. A variety of carbonyl compounds were smoothly converted to the corresponding pentafluoroethyl carbinols in good to high yield under the optimal reaction conditions for each compound (Scheme 1).[1]Furthermore, we succeeded in the flow-pentafluoroethylation of esters and stereoselective flow-pentafluoroethylation of *N*-sulfanylimines.[2]

Keywords: Pentafluoroalkylation; Continuous-flow; Hydrofluorocarbons.

Turning Agricultural Products/Waste into Industrial Commodities for Sustainable and Eco-friendly Materials

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ABSTRACT

Natural fibre-reinforced composites have emerged as a promising alternative to traditional synthetic fibre composites, offering numerous advantages in sustainability, cost-effectiveness, and environmental friendliness. Natural fibres from various plant sources have drawn much attention as researchers work to reduce their dependency on non-renewable resources and lessen environmental effects. In Malaysia, Napier grass and pineapple leaves are great sources of natural fibre with a wide range of commercial potentials. The long, strong fibres of Napier grass, widely planted for agricultural food, are ideal for producing paper, textiles, and composite materials. Its use in creating furniture, packaging, automobile parts, and construction materials can help create a sustainable and affordable substitute for synthetic fibres. As a by-product of pineapple farming, pineapple leaves provide strong fibres known as pineapple leaf fibre (PALF). Due to its superior tensile strength and biodegradability, PALF is a good choice for speciality papers, textiles, and biocomposites. Utilising the fibres from Napier grass and pineapple leaves has the potential to advance sustainable development, lessen waste, and generate eco-friendly substitutes for synthetic products. However, further research and development efforts are crucial to optimise extraction, processing, and application techniques to exploit their potential in the Malaysian industrial sector fully. By harnessing the unique properties of these natural fibres and optimising their integration with polymer matrices, these composites hold great promise for sustainable and eco-friendly material solutions in various industrial sectors.

Keywords: Napier grass fibre; Pineapple Leaves Fibre (PALF); Natural fibre reinforced composites

INVITED SPEAKERS (SOCIAL SCIENCES)

Using ChatGPT in Higher Education: Case Study of Universiti Islam Sultan Sharif Ali (UNISSA)

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ABSTRACT

The emergent of the latest artificial intelligence (AI) technology called ChatGPT has attracted the students and educators in the higher education around the world. Its emerging benefits and oppurtunities, as well as its challenges and ethical implications are however the on-going debate in the academic world. This paper outlines the above matters in terms of teaching and learning, research, administration and regulations in one of Brunei Darussalam's universities, Universiti Islam Sultan Sharif Ali (UNISSA). It also highlights the need of further investigation of how using chatGPT as a learning tool that can be accepted by both students and educators.

Keywords: ChatGPT; Higher education; Brunei.

Education for Sustainable Development Campuses: What, Why and How

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ABSTRACT

Universities are called upon to continue to consolidate these approaches to transform Education for Sustainable Development into a constitutive element in all their activity areas. Universities and higher education institutions are social institutions which essentially form the core of the science system with their three activity fields: Research, Teaching and Services. Universities are responsible for contributing to the future-oriented development of society. Future-oriented development is today led by the guideline of "Sustainability. This paper will then explain what is meant by Education of Sustainable Development Campuses, why is it needed and how to put it into practice?

Keywords: Education; Campus; Sustainable development campuses

Greening The Economy: Towards Boosting Well-being and Prosperity

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ABSTRACT

"Greening the economy: Towards boosting well-being and prosperity' revolves around the issues of sustainable development of Malaysia's economy while boosting the well-being and prosperity of the nation. Moving in this direction requires a paradigm shift. There is a need to transform the traditional economic model to a material balance model that internalises the negative externality effects on society and the environment. The traditional economic model has failed to consider the social dan environmental impacts. The Sustainable Development Goals (SGD) is the universal call to end poverty, protect the planet and ensure that by 2030, all people can enjoy peace and prosperity. The industrialization process has to take heed and manage the causes of the above pollutions. In that context complying and embracing the Sustainable Development Goals (SDGs) is essential. The SDGs or Global Goals are a collection of 17 interlinked global goals are based on three pillars: economic, environmental and social. There are four (4) key economic systems that need to be transformed which are: i. Change the city to a sustainable/green city; ii. Change the energy system to decarbonize /net zero carbon; iii. Change production and consumption to a traceable supply chain; and iv. Change the food system by avoiding food loss/food waste.The World in 2050 (TWI2050) aims to address the full spectrum of transformational challenges related to achieving the 17 SDGs in an integrated manner to minimise potential conflicts among them and reap the benefits of potential synergies of achieving them in unison. TWI2050 identifies six exemplary transformations which will allow achieving the SDGs and long-term sustainability to 2050 and beyond:i. Human capacity and demography (Education, health, ageing, labor markets, gender, inequalities); ii. Consumption and production (Resource use, circular economy, sufficiency, pollution); iii. Decarbonization and energy (Energy access, efficiency, electrification, decent servies); iv. Food, biosphere and water (Sustainable intensification, biodiversity, forests, oceans, healthy diets, nutrients); v. Smart cities (Decent housing, mobility, sustainable infrastructure, pollution); and vi. Digital revolution (Artificial intelligence, big data, biotech, nanotech, autonomous systems)

Keywords: Green economy; Social well-being; Sustainable development

Halal Healing: Embracing Traditional & Complementary Medicine (TCM) within Islamic Guidelines in Malaysia

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ABSTRACT

This abstract introduces the concept of "Halal Healing," which focuses on the integration of Traditional & Complementary Medicine (TCM) within the framework of Islamic guidelines in Malaysia. The abstract emphasizes the importance of adhering to Islamic principles while exploring the vast potential of TCM practices in promoting health and well-being. The abstract highlights the significance of this approach in Malaysia, a country with a rich Islamic heritage and a growing interest in alternative medicine. It emphasizes the need for TCM practices to be aligned with Shariah principles, ensuring that treatments, ingredients, and methodologies are in accordance with Islamic guidelines. Traditional and complementary medicine (TCM) has gained popularity in recent years as an alternative or complementary treatment to conventional medicine. However, the practice of TCM raises several unresolved issues including the potential risks and benefits, the patient's right to informed consent, and the Shariah-compliant status of the practice. Malaysia is a country with Muslim-majority population. The importance of ensuring that TCM conforms to the Shariah ruling is closely related to the right of not only Muslim consumers, but it is extended to non-Muslims too. Muslims require medical treatment that conforms to their faith and religion. Issues such as the halal status of the medicine used by TCM, the issue of close proximity between non-*mahram*, and the issue of *aurat* are significant. Whilst this issue is important to the Muslims it also promotes protection to the non-Muslim. Halal medicine promotes the cleanliness and safety of the product which generally benefits all types of consumers. In the case of TCM, there is often limited scientific evidence to support its cleanliness, efficacy, and safety. Moreover, many TCM practices involve the use of herbs, which can interact with prescription drugs, leading to adverse reactions. Therefore, it is essential to ensure that patients are adequately informed about the potential risks and benefits of TCM and that they have the right to choose between TCM and conventional medicine based on the available information. This paper explores the historical development of TCM in Malaysia, the legal framework governing TCM in Malaysia, Contemporary issues relating to TCM, improved access to alternative healthcare options for the Muslim community, the preservation and promotion of cultural heritage and traditional knowledge and the stance of Malaysia in conforming to the Shariah requirement.

Keywords: Healthcare; Halal medicine; Traditional and complimentary medicine; Law

The Role of Islamic Scholars in the Civilzational Development of Science and Technology: Ethical and Islamic Perspectives

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ABSTRACT

Some people find it hard to believe what science and technology have accomplished in their current state of development. This is in light of the fact that the period in which we currently live is termed as IR4.0 or Society 5.0. Of course, this is made possible by the IoT's progress in technology, which includes Big Data, AI, and other areas. This is a driving force behind the smart and intelligent society that everyone is talking about. Given this most recent breakthrough, it is important to remember how much the Islamic Civilization has contributed to the advancement of science and technology. It begins with a focus on education, which is one of the SDGs and ESGs that the UN is promoting globally. Access to education is a fundamental right that is safeguarded in a free society and is guaranteed to everyone. Education was one of the SDGs that were added after the UN made a point of emphasizing the subject. The advancement of Islamic civilization is significantly influenced by education. Starting with the first verse of the revelation given to Prophet Muhammad SAW, which is concerned with knowledge and wisdom, this can be seen. In the development of Islamic civilization, Education is at the center of things that become a priority for the government. Various institutions that exist such as Nizamiyyah and Baitul Hikmah were created during the early glory era of Islam. It continued until the Ottoman era with their own education system based on the concept of waqf which developed tremendously in their country. In the Malay World, Education also developed greatly especially in the 17th and 18th centuries, for instance in Aceh, where there were institutions such as Dayah, Rangkang and palace that were used as centers of Education. This demonstrates the importance placed on education in the development of Islamic culture. Additionally, Islam places a lot of emphasis on *Adab*, or ethics, when it comes to interacting with knowledge and education. Islamic Scholars also stressed on *Adab* from early generations until today. It should not be taken lightly in any knowledge or talent we pursue, and because of this, Islamic civilization has made contributions to the world for more than 14 centuries.

PHYSICAL SCEINCES

I-CReST 2023:003-001 - Valorization of Discarded Face Mask for Bioactive Compound Synthesis and Photodegradation of Dye

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ABSTRACT

To keep COVID-19 at bay, most countries have mandated the use of face masks in public places and imposed heavy penalties for those who fail to do so. This has inadvertently created a huge demand for disposable face masks and worsened the problem of littering, where a large number of used masks are constantly discarded into the environment. As such, an efficient and innovative waste management strategy for the discarded face mask is urgently needed. This study presents the transformation of discarded face mask into catalyst termed 'mask waste ash catalyst (MWAC)' to synthesise bisindolylmethanes (BIMs), alkaloids that possess antibacterial, antioxidant and antiviral properties. Using commercially available aldehydes and indole, an excellent yield of reaction (62 to 94%) was achieved using the MWAC in the presence of water as the sole solvent. On the other hand, the FT-IR spectrum of MWAC showed the absorption bands at 2337 cm^{-1}, 1415 cm^{-1} and 871 cm^{-1}, which correspond to the signals of calcium oxide. It is then proposed that the calcium oxides mainly present in MWAC can protonate oxygen atoms in the carbonyl molecule of the aldehyde group, thus facilitating the nucleophile attack by indole which consequently improved the product yield. Moreover, the MWAC is also observed to facilitate the photodegradation of methylene blue with an efficiency of up to 94.55%. Our results showed the potential applications of the MWAC derived from discarded face masks as a sustainable catalyst for bioactive compound synthesis and photodegradation of dye compounds.

Keywords: Face mask; Covid-19; Mask waste ash catalyst; Bisindoles; Green chemistry; Methylene blue

I-CReST 2023:005-164 - Introducing Carbon Dots as an Environmentally Friendly Fluorescent Nanomaterial for Chemistry Education at Various Educational Levels.

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ABSTRACT

In the past few years, nanomaterials have become part of our everyday lives through the presence of consumer products. As a result, there is a growing need to incorporate educational activities that introduce these innovative materials into chemistry curricula. This paper presents the utilization of carbon dots as an environmentally friendly alternative to heavy-metal semiconductor quantum dots for introducing nanomaterials into chemistry curricula. Carbon dots, which possess polymeric properties, can be easily synthesized from different carbon sources and a cross-linker like ethylenediamine using a simple and rapid heating process in a conventional microwave. The resulting fluorescent solution requires no further purification. This approach allows for experiments with carbon dots at high school and upper-division college laboratory levels. Introduction of spectroscopy through absorption and emission spectra analysis, determination of quantum yield using a reference fluorescent material, and visualization of particle morphology using transmission electron microscopy are suggested for more advanced undergraduate lab courses where specialized instrumentation is available.

Keywords: Nanotechnology; High school; First year/ upper division undergraduate; Environmental chemistry; Hands-on learning.

I-CReST 2023:028-007 - Optimization of MoO_3 Hole Transport Layer Thickness for Inverted Type Organic Solar Cell via a Simulation Study

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ABSTRACT

Organic solar cells have attracted more attention due to their relatively low production cost and simple fabrication process. Nevertheless, there is still some room for improvement in term of the power conversion efficiency (PCE) in comparison to that of inorganic solar cell. One of the ways to enhance the PCE of organic solar cell is by depositing a hole transport layer (HTL) in between photoactive layer and anode which can extract the holes effectively. The effects of molybdenum oxide (MoO_3) HTL thickness on the performance of organic solar cell with FTO/ZnO/poly(3-hexylthiophene):(6,6)-phenyl-C61-butyric acid methyl ester (P3HT:PCBM)/MoO_3/Ag structure has been examined via a simulation study using SCAPS (Solar Cell Capacitance Simulator) software. It is interesting to find that the PCE increased with MoO_3 layer thickness ranging from 0 to 40 nm. However, a continued increase in the MoO_3 layer thickness to 80 nm led to a lower PCE. The device with MoO_3 layer thickness of 40 nm exhibited the highest value of PCE (2.517%).

Keywords: Hole transport layer; MoO_3; Organic solar cell; SCAPS; Simulation.

I-CReST 2023:030-010 - Experimental and Prediction Studies of Marine Extracts as Anti-corrosion Additive in Epoxy Coating

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ABSTRACT

The infrastructure in the marine field is usually used mild steel as a construction material. in fact, it has been used as a main material in ship construction for while due to its excellent mechanical properties such as high strength, good ductility, and low cost. However, the construction of infrastructure in marine environments requires better prevention due to corrosion problems. One of the alternatives to slow down the corrosion process is through a coating. In this study, seaweed and sea grape extracts were used as an additive in epoxy coating with the aim to observe their function as an anticorrosive additive for mild steel in seawater. Seaweed and sea grapes have been opted for due to an increasing interest in green materials for a better environment. Seaweed and sea grape extracts were formulated in epoxy coating and then applied on the mild steel surface. The coated surface was characterized by electrochemical impedance spectroscopy (EIS) while the coating film was characterized by using x-ray diffraction (XRD), Fourier transforms infrared (FTIR), and Ultraviolet-Visible (UV-Vis). To predict the real impedance of the coating, a Long-short term memory (LSTM) training algorithm was used by utilizing an EIS dataset as input via Matlab. It was found that the newly formulated coating exhibits great potential as an anti-corrosion additive and LSTM has successfully predicted the real impedance with low root mean square error (RMSE).

Keywords: EIS; Epoxy; LSTM; Marine extract; Mild steel

I-CReST 2023:041-019 - DFT Calculations and Preliminary Study of 8-Carboxamidoquinoline Derivative as Zinc Label

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ABSTRACT

The increased concentration of zinc ion (Zn^{2+}) in water may exacerbate the environmental issue by preventing microbial activity and causing an unpleasant odour. As a result, 8-carboxamidoquinoline derivatives have been continuously investigated as a zinc label in an effort to overcome concerns with low membrane permeability, weak water solubility, and the difficulty of quantitatively quantifying free Zn^{2+} ion in cells. Thus, this work aims to provide information on understanding, designing, synthesizing, and researching the potential of 2-oxo-2(quinolin-8-ylamino)acid (OQAA) for further use as a zinc label in order to enhance selectivity and sensitivity of the zinc's chemosensor. The density functional theory (DFT) approach with Becke-3-Parameter-Lee-Yang-Parr (B3LYP) and 6-31G(d,p) basis set was used to calculate the optimum molecular structure, frontier molecular orbitals (FMOs), and energy band gaps of OQAA. Then, hybrid GEN approach is used to compute the intermolecular interaction energy of complexation OQAA-Zn using the basis sets DFT/6-31G(d,p) and LANL2DZ, respectively. Afterwards, OQAA was synthesized and subjected to spectroscopic analysis. In comparison to other metal cations examined (Hg^{2+}, Cd^{2+}, Cu^{2+}, Ni^{2+} Co^{2+}, and Fe^{2+}), OQAA demonstrated exceptional and good fluorescence amplification selectively and qualitatively exclusively for Zn^{2+} under UV lamp (365 nm). As shown by Job's plot and ^{1}H NMR titrations, the stoichiometric binding ratio of OQAA-Zn^{2+} is 1:1, (M_1L_1). It is also implied that Zn^{2+} is binding to an amide by the significant shift of the N-H amide proton to a greater chemical shift and the rapid fall in proton peak intensity. These adjustments verified interactions between the metal Zn^{2+} ion and the ligand OQAA. In conclusion, OQAA could successfully optimize and develop for Zn^{2+} sensors on its own because of the results outlined.

Keywords: Density functional theory; 8-carboxamidoquinoline; NMR titration; fluorescent titration; complexation

I-CReST 2023:066-276 - Depolymerization of Poly(Ethylene Terephtalate) by Glycolysis at Ambient Temperature

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ABSTRACT

Poly(ethylene terephthalate) (PET) is a synthetic polymer that is extensively used as plastic bottles. PET bottles have become a big problem in waste management and the environment. The cost for waste management of PET plastic waste can be costly since the bottles are hardly degradable. Due to the growing concerns arising from PET plastic waste, depolymerization is crucial to reduce waste production and promote sustainability. Depolymerization of PET to bis(2-hydroxyethyl) terephthalate (BHET) was successfully carried out via glycolysis using ethylene glycol (EG) at ambient temperature. Used PET samples were obtained from commercial plastic bottles and were dissolved in 4 different acids; acetic acid (CH_3COOH), hydrochloric acid (HCl), sulphuric acid (H_2SO_4), and trifluoroacetic acid (TFA) for 24 hours. The range of acid concentration used was between 3 to 13 M for each acid respectively. The dissolution of used PET was successfully carried out in 11 M, 12 M and 13 M of TFA only. White precipitate was formed immediately upon addition of EG into the used PET+TFA dissolved mixture at room temperature. The white precipitate was collected after 24 hours of reaction and filtered using vacuum filtration. The solid was dried and characterized using Attenuated Total Reflectance-Fourier Transform Infrared Spectroscopy (ATR-FTIR) and ^1H Nuclear Magnetic Resonance (^1H-NMR) which confirmed the formation of BHET as the product of used PET depolymerization via glycolysis. Overall, the depolymerization of used PET to BHET via glycolysis using EG with the aid of acids as solvent for dissolution was successfully carried out.

Keywords: Depolymerization; Poly(ethylene terephthalate) (PET); Ethylene glycol (EG); Glycolysis; Bis(2-hydroxyethyl) terephthalate (BHET)

I-CReST 2023:067-248 - Understanding the Effects of *Chlorella sorokiniana* to the Internal Liquid Crystalline Nanostructures

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ABSTRACT

Liquid crystalline nanoparticles (LCNPs) have been proven to be an effective delivery vehicle to increase the bioavailability and stability of the drugs upon administration. However, the high energy demands for the preparation of LCNPs and the limited choice of lipid with high cost have been a major curb to their broad application in the pharmaceutical industries. Hence, this study focused on the formulation of LCNPs consisted of a binary lipid mixture of citric acid ester of monoglyceride (citrem) and soy phosphatidylcholine (SPC) based microalgae *C.Sorokiniana*. This microalga was selected in this study as they grow rapidly, cost-effective and possessed natural antioxidant properties. All the formulations were prepared using high energy emulsification method and were characterized by Fourier Transform Infrared spectroscopy (FTIR), Differential Scanning Calorimetry (DSC) and Ultra-Violet-Visible (UV-Vis) spectroscopy. The results based on the FTIR spectral revealed the presence of phenolic substances, proteins and polysaccharides showing that the algae used in these formulations carries immense potential values that can be used for synthesizing formulations with naturally occurrence of antioxidant The DSC analysis showed a chemical interaction between LCNPs and algae *C. Sorokiniana*. The phytochemical activity of algae-based LCNPs was also compared with pure algae as well as algae-free and atorvastatin-loaded formulations using DPPH free radical scavenging assay. The IC_{50} value for *C. Sorokiniana* extract was 80.77µg/mL, while for algae-based LCNPs were 635 µg/mL for C:S 1:1 and 781 µg/mL for CS 4:1. Although the IC_{50} value for pure extract was found to be much lower than algae-based LCNPs, indicating of better antioxidant properties in pure algae, the stable algae-based LCNPs was successfully formulated, and the antioxidant properties was not obliterated after the formulation process.

Keywords: Liquid crystalline nanoparticles ; Microalgea; Antioxidant; Drug delivery

I-CReST 2023:069-037 - Mechanical Characterization and Biodegradability Assessment on Waste-Derived Glass-Ceramics

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ABSTRACT

There is a growing demand for bioactive glass-ceramics in biomaterial applications due to their promising properties, such as functionality and mechanical strength. The use of dental materials for the restoration of teeth is increasing worldwide. However, as human ages, the loss in mechanical strength over time is the main reason for the replacement of teeth restoration. Moreover, environmental technology has been promoted in many countries. Waste materials cannot be ignored or dumped into landfills, instead can effectively be transformed into valuable products for industrial application. Hence, this study highlighted the fabrication of the fluoride-containing glass-ceramics utilizing eggshell waste as a calcium source via the conventional melt-quenching technique. The mechanical characterization and in-vitro biodegradability assessment were performed on the glass-ceramics using phosphate buffer saline (PBS) as an immersion medium. The samples were sintered at 800°C for 2h and immersed for 7 and 14 days. From the findings, the XRF analysis revealed the purity of the CaO produced in calcinated eggshell is 97.90%. The Vickers hardness and fracture toughness of the samples after 14 days of immersion were 6.33GPa and 2.98MPa·$m^{1/2}$, respectively, which is comparable to the commercial glass-ceramics used in dentistry. Additionally, the pH increased from 7.43 to 7.66, indicating the bioactivity of the samples in response to the PBS solution. Similarly, the weight loss of the samples is an indication of the biodegradation of the samples. The weight loss in the first 7 days was due to the leaching of ions from the samples with the concentration of Si and Ca in the PBS medium. After 14 days, the weight gain was related to the precipitation of the calcium and phosphate ions from the PBS on the sample's surface, indicating apatite formation. The prepared waste-derived glass-ceramics may find their potential as candidate materials in dental applications.

Keywords: Glass-ceramics; Eggshell waste; Mechanical properties; Biodegradability; Weight loss

I-CReST 2023:070-038 - Systhesis of Sm^{3+}/Eu^{3+} co-doped Willemite Glass-Ceramics

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ABSTRACT

Willemite (Zn_2SiO_4) is one type of glass-ceramic that can convert from glass to glass-ceramics through controlled sintering temperature. Willemite is an outstanding phosphor host material because of its chemical and thermal stability, transparency in the UV-visible range, excellent color purity, and high luminescence efficiency. However, willemite's low intensity of red emission has restricted its applicability as a red phosphor. Meanwhile, the single-doping of samarium on the willemite glass-ceramics has weaker emission intensity than the co-doping of rare-earth. Therefore, the samarium oxide and europium oxide were co-doped into the willemite glass-ceramics to enhance the reddish-orange emission. The melt-quenching and sintering method has been used to synthesize the willemite glass-ceramics ($x$$Eu^{3+}$, 3wt.% Sm^{3+}: Zn_2SiO_4, x =1, 2, 3 wt.%) . In the meantime, the waste soda-lime-silica (SLS) glass bottle was used as the source of SiO_2 to synthesize the willemite sample. X-ray fluorescence (XRF) analysis of waste SLS glass confirmed it contains 68.90 wt.% SiO_2, thereby confirming the possibility of using it as an alternative source of SiO_2. Moreover, photoluminescence (PL) reveals the emission intensity will increase as Eu^{3+} content rises and drops after 2 wt.% Eu^{3+} due to concentration quenching effect. The reddish-orange emission at 612 nm ($^5D_0 \rightarrow {}^7F_2$) indicates the most intense emission among all the emissions. Therefore, in this study, the 2 wt.% Eu^{3+}, 3 wt.% Sm^{3+}: Zn_2SiO_4 shows the optimum emission among the other sample. Additionally, the CIE chromaticity coordinates were approximately (0.60, 0.40), which fall in the reddish-orange region. These results suggest the samarium and europium co-doped willemite glass-ceramics potentials as a reddish-orange phosphor host in the optoelectronic device.

Keywords: Willemite; Samarium; Europium; Co-doped; CIE chromaticity

I-CReST 2023:075-065 - Computational Fluid Dynamics (CFD) Simulation on the Hydrodynamics of Immiscible Fluids in a Spinning Disc Reactor

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ABSTRACT

The spinning disc reactor (SDR) is an emerging new technology, which is part of process intensification, so there is still room for research and increasing the mixing performance. This work simulates the hydrodynamic behaviour of mixing immiscible fluids on different topography disc surfaces using volume of fluid (VOF) model. This work also analyses hydraulic jump formation on the disc surface. The immiscible fluids used are water and kerosene for the mixing, and only water was used to analyse the hydraulic jump formation. The effect of rotational speed and velocity inlet on the liquid-liquid flow pattern, mixing quality and the hydraulic jump formation are investigated. It was found that the grooved disc surface had better mixing capability than the smooth surface. This occurrence is because of the surface topography. It was also found that the liquids exhibited two flow patterns apart from the spiral flow, namely film flow, which was present at a low rotational speed, and filament flow, which was present at a high rotational speed. The influence of disc rotational speed and velocity inlet of liquids on hydraulic jump formation are also studied. The results show that the hydraulic jump location depends on the fluid velocity inlet. The hydraulic jump location grows with an increase in velocity inlet. It also shows that the hydraulic jump height depends on the rotational speed. The hydraulic jump height decreases as the disc rotational speed increases from 250 rpm to 1500 rpm.

Keywords: Spinning disc reactor; Hydrodynamics; Computational fluid dynamics; VOF model

I-CReST 2023:077-054 - ZnO/Ni Composite: Synthesis, Characterization and Photocatalytic Activity Under UV Light Irradiation

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ABSTRACT

ZnO/Nickel (ZnO/Ni) heterostructures have been studied extensively as potential hybrid materials for photocatalysis applications due to their unique properties and potential applications. The photocatalytic efficiency of ZnO alone is compromised by its wide bandgap energy and high exciton binding energy. To enhance the effectiveness and photostability of ZnO nanoparticles, they can be doped with other elements such as transition metals, non-metals, and noble metals. Herein, we report a facile ultrasonic-assisted chemical mixing technique to prepare ZnO/Ni composite photocatalyst at various weight ratios (10 – 50 %). Photocatalytic ability of as synthesized samples was examined for the degradation of methyl orange dye. The ZnO/Ni composite has been characterized by X-ray diffraction (XRD), Field emission scanning electron microscopy (FESEM), Energy-dispersive X-ray (EDX) spectroscopy, Fourier-transform infrared spectroscopy (FTIR) and ultraviolet–visible absorption (UV–Vis). It is found that the 10 wt% ZnO/Ni composite producing the highest photocatalytic efficiency with percentage degradation of 89.17% and photodegradation rate constant of 0.0285 min^{-1} compared to other samples. These results suggested that introduction of Ni act as an electron sink and promote charge separation to ZnO can efficiently absorb light and promote charge separation, leading to enhanced photocatalytic activity. The enhanced photocatalytic ability of ZnO/Ni composite make it a potential candidate for removal of organic pollutants from wastewater.

Keywords: Composite; Nickel; Photocatalytic; Zinc Oxide

I-CReST 2023:080-135 - Chronoamperometry of Gold(I) Diiodide Anions in Iodine-Iodide Solutions

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ABSTRACT

In recent years, the electrodeposition of gold (Au) from the leachate solution after the leaching of Au from the printed circuit boards (PCB) of electronic waste (e-waste) has received significant attention from the researchers due to is feasibility. In this study, the electrochemical technique which is chronoamperometry was use to evaluate the kinetics of the Gold(I) Diiodide $[AuI_2]^-$ reduction in Iodide-Iodide solution. The chronoamperometry was carried out with Platinum plate electrode in Iodine-Iodide solutions at different Au concentrations. The Diffusion coefficients for Au reduction were determine for concentration ranging from 0.010 mg L^{-1} to 0.050 mg L^{-1} of Au at constant temperature of 25 ^oC. The estimated diffusion coefficients were compared with the literature.

Keywords: Chronoamperometry; Diffusion coefficients; Gold electrodeposition; Iodine; Electrochemistry

I-CReST 2023:081-044 - Structural, Magnetic and Dielectric Study of $La_{0.90}Bi_{0.10}Mn_{0.90}Ni_{0.10}O_3$

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ABSTRACT

In this paper, $La_{0.90}Bi_{0.10}Mn_{0.90}Ni_{0.10}O_3$ was fabricated using the conventional solid-state method by sintering at 1200 °C for 12 hours. X-ray diffraction shows $La_{0.90}Bi_{0.10}Mn_{0.90}Ni_{0.10}O_3$ has an orthorhombic *Pnma* structure with lattice parameter of a = 5.85 Å, b = 5.61 Å, c = 7.79 Á. SEM photographs shows presence of grains with few voids. Magnetic properties of the sample has shown values of coercivity, Hc = 16.30 G, saturated magnetization, Ms = 2.09 emu/g and retentivity, Mr = 3.36 x 10^3 emu/g. The dielectric permittivity and dielectric loss are both frequency and temperature dependent in the range of 0.01 Hz – 100 kHz, from room temperature to 473 K. The dielectric loss tangent of the compound was determined resulting in the range of 0.5 to 1.75. Impedance and admittance Cole-Cole plot of the composite shows a single semicircle attributed to the bulk properties of the grains. The dielectric properties were investigated in detail using the universal capacitor response function. Modeling analysis indicates the electron motions are highly correlated in both inter and intra-clusters. The activation energy obtained from the conductivity of the samples has a value of 0.0918 eV which is in the range of charge carrier hopping process between Mn^{3+} and Mn^{4+}.

Keywords: LBMO; Solid-state reaction; Dielectric; Circuit model; Magnetic

I-CReST 2023:089-049 - The Spinel Phase $LiMnTiO_4$ Doped with Yt as Potential Cathode for Rechargeable Lithium-ion Batteries

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ABSTRACT

One of the challenges for improving the performance of lithium-ion batteries is the development of suitable cathode materials. $LiMn_{1.9}Ti_{0.1}O_4$ has shown promises, but improvements are needed to increase the capacity retention and its specific capacity. In this work, the self-propagation combustion method (SPC) is used to synthesis $LiMn_{1.9}Ti_{0.1}O_4$ doped with Ytterbium (Yb). The objective of this study is to obtain pure and single-phase structure by optimizing the annealing temperature. The SPC method produces single and pure phase materials. Thus, the essential features of materials synthesized using the SPC method, such as thermal behaviour, crystal structure and particle size, were thoroughly investigated. Simultaneous Thermogravimetric Analysis (STA) was used to investigate the thermal characteristics of these materials in order to establish the optimal annealing temperature for phase formation. Based on the thermal profiles of the samples, the annealing temperature for $LiMn_{1.9}Ti_{0.1}O_4$ with its doped materials, $LiMn_{1.9}Ti_{0.1-x}Yb_xO_4 (x = 0.01)$ were chosen that is 700°C. X-Ray Diffraction (XRD) was used to investigate the structure for all materials and results revealed that all samples annealed for 24 hours at 700°C were pure and single phase. From the XRD results obtained, it shows doped Yb in $LiMn_{1.9}Ti_{0.1}O_4$ materials is a promising cathode material due to the pure compound and single-phase materials. Thus, it has the potential to be used as a cathode material in lithium-ion batteries.

Keywords: Cathode; lithium-ion; $LiMn_{1.9}Ti_{0.1}O_4$; Ytterbium

I-CReST 2023:092-057 - Synthesis and Characterisation of $LiMn_{1.9}Ti_{0.1-x}Ce_xO_4$ for Cathode Lithium Ion Battery

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ABSTRACT

Spinel $LiMn_{1.9}Ti_{0.1}O_4$ compounds undergo significant capacity fading upon repeated charge-discharge cycling. Due to this difficulty, its anatomic and morphological properties as well as its electrochemical performance can be improved by doping. In this work, the doping of $LiMn_{1.9}Ti_{0.1}O_4$ with Cerium (Ce) is performed using the self-propagating combustion (SPC) method. The driving force for this work is to obtain a pure single-phase structure. The SPC method yields single-phase and pure-phase materials. Therefore, fundamental properties such as thermal behaviour, structural and particle size of samples synthesized by SPC method have been studied in details. The thermal properties of the materials were studied by Simultaneous Thermogravimetric Analysis (STA) as to determine the suitable temperatures for phase formation that is 700 ° C. The annealing temperature of $LiMn_{1.9}Ti_{0.1}O_4$ containing the doped material $LiMn_{1.9}Ti_{0.1-x}Ce_xO_4$ (x = 0.01) was chosen based on the thermal profile of the samples. All material phases were investigated by X-ray Diffraction (XRD). XRD showed that all samples annealed at 700 ° C for 24 hours were pure and single phase. Thus, the doped $LiMn_{1.9}Ti_{0.1-x}Ce_xO_4$ material has emerged as a good candidate for the cathode materials.

Keywords: Cathode; Lithium-ion; $LiMn_{1.9}Ti_{0.1}O_4$; Cerium

I-CReST 2023:093-051 - Morphological, Structural, Optical and Photocatalytic Properties of Cu-Ni/TiO_2 Nanoparticles Annealed at Various Temperatures

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ABSTRACT

The annealing temperature is one of the main factors that can affect the photocatalytic efficiency of the photocatalyst semiconductor because it can alter the structural, morphological, and optical properties of the photocatalyst. In this work, 3 wt% of copper and nickel co-doped in TiO_2 nanoparticles were synthesized using the sol-gel method and annealed at temperatures ranging from 400 to 800°C. The structural phase of the Cu-Ni/TiO_2 was transformed from anatase to rutile phase due to the increment of annealing temperature. The annealing temperature at 400°C exhibited the single anatase phase, and the anatase-rutile mixed phase was present at 600 and 700°C. The rutile phase content increased with the annealing temperature, resulting in the single rutile phase at 800°C. As the annealing temperature increased, the crystallite size and average particle size of Cu-Ni/TiO_2 were also increased, while the photocatalyst's specific surface area and band gap reduce. These results proved that the anatase phase has a smaller crystallite size and higher specific surface area than the rutile phase. The photocatalytic performance of Cu-Ni/TiO_2 for each sample was evaluated by choosing methylene blue as a model dye under UV light irradiations for 120 mins for reaction time. The anatase-rutile mixed phase with the anatase phase as the dominant phase content annealed at 600°C exhibited the best photocatalytic performance with the highest photodegradation percentage and photoactivity rate constant value among the samples in this study due to the synergistic effect of the crystallinity and phase structure of the photocatalyst. Therefore, the anatase-rutile mixed phase of the Cu-Ni/TiO_2 annealed at 600°C appears to be a promising sample for environmental applications such as water purification. Based on these results, the structural, morphological, and optical properties of photocatalysts can be varied by controlling the annealing temperature during the synthesis process of the photocatalyst.

Keywords: Cu-Ni/TiO_2 nanoparticles; Photocatalyst; Annealing temperature; Mixed-phase; Sol-gel method

I-CReST 2023:102-056 - The Effect of Cellulose Nanocrystal (CNC) from Pomegranate Husk as Filler on the Properties of Cassava Starch-based Bioplastics

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ABSTRACT

The issue of plastic waste and its impact on the environment has become increasingly concerning, given the limited ability of most plastics to be recycled or biodegrade naturally on land. To address this, the current study investigated the production of bioplastics using cassava starch as the matrix and cellulose nanocrystals (CNC) extracted from pomegranate husk as the reinforcing filler. The preparation of pomegranate husk-CNC (PH-CNC) involved several steps, including delignification, bleaching, hydrolysis, and sonication. The resulting PH-CNC was added to the bioplastics at varying concentrations, including 0.5 g (BP2), 1.0 g (BP3), 1.5 g (BP4), and without PH-CNC as a control (BP1). The newly formed bioplastics were analyzed using Fourier transform infrared (FTIR) spectroscopy, and biological testing was conducted to assess biodegradation, water solubility, and water uptake. The FTIR analysis confirmed the absorption pattern of cellulose in the starch-PH-CNC bioplastic matrix. Moreover, the addition of PH-CNC fillers to the bioplastics decreased the time taken for the bioplastics to biodegrade fully. Specifically, the BP4 formulation with the highest amount of PH-CNC (1.5 g) took approximately 15 days to biodegrade, while the control (BP1) took over 21 days to degrade fully. The percentage of solubility increased proportionally with the concentration of PH-CNC, with BP4 (1.5 g of PH-CNC) demonstrating a solubility percentage of 98.80% in water. In contrast, BP1 (0 g of PH-CNC) exhibited a higher percentage of water uptake than BP4, with 27.06% of water uptake. Overall, the study demonstrated that the addition of CNC can improve several key properties of cassava-starch-based bioplastics. Specifically, the inclusion of PH-CNC as a reinforcing filler decreased the time to biodegradation and increased water solubility, highlighting the potential of such materials as a more sustainable alternative to traditional plastics.

Keywords: Biodegradation; Bioplastic; Cassava starch; Cellulose nanocrystal; Pomegranate husk

I-CReST 2023:103-058 - Slow Release Irrigation and Water Retention Performance of Cellulose Hydrogel in Self-growing Chinese Cabbage

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ABSTRACT

In this study, a green regenerated superabsorbent hydrogel was fabricated of dissolved oil palm empty fruit bunch (EFB) cellulose in green solvent of NaOH/urea. The objective of this research was twofold: firstly, to implement the self-watering system utilizing cellulose hydrogel as a soil supplement for the cultivation of Chinese cabbage, and secondly, to examine the plant's growth performance. Briefly, the process of preparing cellulose hydrogels involved dissolving cellulose in a NaOH/urea solvent at a low temperature to form a cellulose solution. Cellulose hydrogel was obtained after adding crosslinker into cellulose solution at 5 oC. The appropriate growing medium for plants was prepared and consequently, mixed it with cellulose hydrogels at various percentages. Chinese cabbage seeds were then directly sowed onto the growing medium and water was added to ensure a homogeneous mixture. The growth performance was evaluated based on several factors such as the cotyledonary rate of Chinese cabbage, height, number of leaves and moisture. After two weeks, the seedlings were harvested and the results showed that a higher percentage of hydrogel led to better growth performance, with taller stems and more leaves produced. The rate of cotyledonary was also faster with a higher percentage of cellulose hydrogel in the growing medium. Additionally, the moisture percentage of the medium was significantly higher for the highest cellulose hydrogel concentration after 14 days. These findings suggest that the use of hydrogel in soil for agriculture can be an effective alternative technique for self-planting, especially in modern lifestyles, and better community economic management.

Keywords: Cellulose hydrogel; Chinese cabbage; Cotyledonary rate; Growth performance; Green solvent

I-CReST 2023:135-097 - An Overview of Modeling and Optimization Studies in Low-Density Polyethylene (LDPE) in High Pressure Tubular Reactor

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ABSTRACT

Low-density polyethylene (LDPE) is the first thermoplastic polyolefin utilized in commercial applications and is unique in its polymerization process. Due to its extensive range of molecular and structural properties, LDPE has become one of the most important polymers with great industrial significance. As the demand rises, LDPE manufacturers face challenges in meeting market demands for stringent product quality at minimal production costs and emerging environmental concern. These factors influence the work of numerous researchers in these areas. Due to the complexity of the reactor design and operation, the mathematical model remains the most effective and safest approach for researchers to study and comprehend the complex relationship between the variation of process design and operation output variables derived from conversion and product quality specification. This paper presents a structured overview of the approaches proposed to model LDPE in high pressure tubular reactor and its recent progress. The chosen classification, which is based on their theoretical and numerical grounds, will allow researchers to gain an understanding of the fundamentals of these modeling techniques and their associated numerical methods as well as to have a critical perspective on their applications.

Keywords: Low-density polyethylene; Polymerization; Tubular reactor; Modeling; Simulation

I-CReST 2023:136-108 - Influence of SnO_2/ZnO Electron Transport Bilayer Toward the Performance of P3HT:PCBM-based Inverted Type Organic Solar Cell

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ABSTRACT

Organic solar cells (OSCs) have attracted much research attention due to their advantages such as low cost, easy processing, light weight, flexibility and suitable for large-scale production. In this work, an inverted type OSC was studied since the conventional structure OSC has shown poor stability under atmospheric pressure which then results in the degradation of the power conversion efficiency (PCE). Due to its favourable attributes such as high electron mobility, wide bandgap as well as deep conduction band and valence band, SnO_2 was chosen in this study as cathode interfacial layer placed in stacked structure with ZnO. The electron transport bilayer was inserted between transparent fluorine-doped tin oxide (FTO) and the P3HT:PCBM photoactive layer. In this paper, we present experimental analysis of the different configurations of electron transport layer (ZnO only, SnO_2/ZnO and ZnO/SnO_2) toward the PCE of inverted type OSCs. The SnO_2 layer was synthesized via sol-gel method by using ethanol as solvent and tin (II) chloride dihydrate ($SnCl_2.2H_2O$) precursor. The SnO2 thin film was spin coated at 3000 rpm for 30 second and annealed at 300°C. Among the devices, the devices with SnO_2/ZnO electron transport bilayer showed the highest PCE.

Keywords: Electron transport layer; Organic solar cell; P3HT:PCBM; SnO_2

I-CReST 2023:137-110 - Bimetallic Nanoparticles Embedded Reduced Graphene Oxide: Surface–Enhanced Raman Scattering Substrate (SERS) for Detection of Beta-D-Glucose

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ABSTRACT

Surface-enhanced Raman scattering (SERS) is a technique for enhancing the Raman scattering of molecules supported by nanostructured materials. The SERS substrates based on bimetallic nanoparticles of gold-silver embedded reduced graphene oxide (Au-Ag NPs:rGO) provides additional synergistic properties such as higher effective surface area and enhanced Raman response for sensitive biomolecules detection. Herein, this study presents a simple method for fabricating SERS substrates of Au-Ag NPs:rGO for beta-D-glucose detection. The graphene oxide (GO) was prepared via modified Hummer's method and further reduced to rGO via thermal reduction method. The bimetalic NPs at different ratios; i.e., 1:3 of Au-Ag and 1:3 of Ag-Au, were chemically synthesized and their plasmonic properties were characterized by ultraviolet-visible spectrometer to give approximate NPs size of between 15 nm to 60 nm. The Au-Ag NPs:rGO nanocomposite were spin-coated onto clean glass substrate and the SERS response were analyzed via Raman spectrometer. Enhancement to the two identical D- and G-peaks from rGO was observed with addition of bimetalic NPs to indicate electromagnetic wave amplification on the SERS substrate. The SERS responses under different concentration of beta-D-glucose solutions (0.1 M, 0.01 M and 0.001 M) were also analyzed. Reduction to the signal-to-noise ratio of D- and G-peaks were observed to represent lower SERS interaction under competitive adsorption of higher concentration of beta-D-glucose on SERS substrates. These responses can be utilized to characterize the presence of higher beta-D-glucose concentration in sample, especially for diagnosis of diabetic disease.

I-CReST 2023:139-275 - A Study of X-Ray Diffraction (XRD) and Surface Morphology Studies of PVC Complexes

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ABSTRACT

In this work, the proton conducting polymer electrolytes were prepared by solution cast technique. Poly (vinyl chloride) PVC is used as the polymer host, ammonium triflate ($NH_4CF_3SO_3$) as the doping salt and ethylene carbonate (EC) and butyltrimethyl ammonium bis trifluoromethyl sulfonyl imide (Bu_3MeNTf_2N) is used as the plasticizers. Characterization techniques of XRD and FESEM were used to study the properties of the PVC based proton conducting polymer electrolytes. XRD studies shows that amorphous PVC becomes largely amorphous in nature upon addition of $NH_4CF_3SO_3$. Largely amorphous in nature is also obtained upon addition of EC and Bu_3MeNTf_2N to PVC-$NH_4CF_3SO_3$. XRD studies of the salted samples showed that they are largely amorphous in nature. However, XRD studies could not identify for sure the most amorphous sample. Identification of the most amorphous sample is imperative as conduction in polymer electrolytes is known to occur in the amorphous region. The FESEM micrographs gave a qualitative idea of the amorphousity of the salted samples in that A4 had the most grey regions in its micrograph giving a strong indication of it being the most amorphous sample. In case of the EC plasticised system, the micrographs showed that the pore size increased with increasing concentration of EC which in turn caused the amorphous regions (grey area) to decrease. This means that B1, which has the smallest pore size and the most grey area is the most amorphous sample. In the micrographs of Bu_3MeNTf_2N plasticised samples, the sample C3 is observed to be more homogeneous with more white spherulites indicating presence of more trapped ionic liquid. This broadly indicates that C3 is the most amorphous due its homogeneity as compared to the sample C1.

Keywords: Polyvinyl Chloride (PVC); X-ray diffraction; Surface Morphology; Polymer electrolytes; Amorphous

I-CReST 2023:146-134 - Airborne Microplastics Abundance and Composition in Universiti Malaysia Terengganu

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ABSTRACT

Microplastics are present in the atmospheric environment due to their small size and low density, which make them blown around the Earth by the winds. The present study aimed to determine the presence of microplastics in the atmosphere, as well as their physical and chemical characteristics by collecting samples from a coastal area in Universiti Malaysia Terengganu. The results showed that the average concentration of airborne microplastics was 141.9 particles m^{-2} d^{-1}, with a predominance of microplastic fibers. The complementing results of both Energy dispersive X-ray spectroscopy (EDS) and Attenuated Total Reflectance-Fourier Transform Infrared spectroscopy (FTIR) suggested that the dominant polymers in coastal area were polyester (PES). To enhance understanding of microplastics from atmospheric fallout in coastal regions, it is crucial to profile spatiotemporal variation of microplastic abundance in the atmosphere and their characteristics, leading to identification of the sources of microplastic pollution.

Keywords: Microplastics; Atmosphere; Coastal

I-CReST 2023:150-115 - Novel Cyclic Undecapeptides/Reduced Graphene Oxide Surface: Physicochemical and Antibacterial Properties

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ABSTRACT

Microbial infestation in wastewater is a growing concern in the world. The incorporation of antimicrobial peptide (AMP) on graphene-based materials is a growing strategy to overcome the shortcomings presented by conventional antimicrobial nanomaterials. In this study, novel cyclic undecapeptides from the linear analogue (KRQRFYFRQRK and QNKRFFFRKNQ) were successfully synthesized via cyclization using a green synthetic protocol. The cyclic peptides were immobilized on the reduced graphene oxide surface using carbodiimide (EDCI/HCl). The structural, morphology and chemical characterizations of the anti-microbial graphene material were carried out using SEM, Raman, FT-IR, XRD, XPS and UV-Vis spectroscopy. From our result, the antimicrobial cyclic peptide/rGO composite showed an improved antibacterial killing effect towards Gram-positive (*Staphylococcus aureus*) and Gram-negative (*Pseudomonas aeruginosa*). The enhanced antibacterial property is attributed to the synergistic effect of the sharp edges of rGO and the amphipathic moieties of the cyclic peptides.

Keywords: Cyclic undecapeptides; Reduced graphene oxide; Antibacterial

I-CReST 2023:158-121 - Influence of Metal Dopant (Cu, Co, Sm, Sn) to Ni/ScSZ Thin Film Anode in Solid Oxide Fuel Cell

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ABSTRACT

Solid oxide fuel cells (SOFCs) are highly efficient electrochemical conversion devices that generates electrical energy through electrochemical reaction of gaseous fuel. Small metal addition on the SOFC anode catalyst has the potential to increase the performance and tolerance of SOFC towards hydrocarbon fuel. This study is aimed to identify the effect of metal catalysts doping on the microstructure and electrochemical performance of Ni/ScSZ thin composite anodes on the SOFC electrolyte supported cell with surface infiltration method. The impact on the anode catalyst's microstructure, distribution of element and elemental analysis was carried out using SEM-EDX and XRD analysis. The electrochemical performance of the cells was evaluated by the maximum power density and open-circuit-voltage (OCV) from the current-voltage (iV) measurement in hydrogen and in hydrocarbon fuel (biogas). The results of this study found that the presence of dopant introduction of 5wt% dopant/Ni can be detected by EDX, but not with lower concentration. For Sn, Sm and Cu doped cells, the XRD analysis detected Ni3Sn, Ni2Sm and Cu0.81Ni0.19 alloy formed, respectively. Doping by 0.5wt% of Sn/Ni and 5wt% of Sm/Ni improved the electrochemical performance in hydrogen by at least two-fold (184mW/cm2 and 100mW/cm2, respectively) compared to 49 mW/cm2 in the undoped cell. Addition of Cu showed the best tolerance with biogas operation. Co addition on the other hand posed a negative impact as the microstructure of the anode catalyst become overly dense with Co addition. This work observed different impact dopant on the distribution and affected the cell's porosity which influenced the electrochemical reaction. However, as the result on performance with biogas deviates from previous investigation with anode supported cell, it can be concluded that for electrolyte supported cell with thin anode which have limited catalytic area as the reforming reaction compete with the triple phase boundary area for electrochemical reaction.

Keywords: Anode modification; Fuel cell; Metal alloying; Solid oxide fuel cell; Surface infiltration

I-CReST 2023:160-125 - Vibration Analysis of the Distributed Optical Vibration Sensor based on Optical Fiber on Various Surrounding Material and Water Content

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ABSTRACT

Distributed acoustic sensing (DAS) has been a popular technology in recent years. The localization and restoration of turbulence can be performed by monitoring acoustic turbulence in the expanded area of optical fibres, then demodulating and processing the optical signal. Optical fibre acoustic sensing technology has the advantages of large-scale monitoring, good concealment, good flexibility, anti-electromagnetic interference, and has great social benefits. Besides, through several research, there have been a lot of achievements in pipeline leakage and more based on the flow rate, pressure and other parameters of monitoring and sound propagation along the wall. However, numerous areas remain unexplored in research investigations, such as the fact that most vibration measurements are exclusively dependent on the strength and location of the vibration, as well as the failure to diversify the surrounding conditions. As a result, in this work, we will examine and do research on vibration analysis of the distributed optical vibration sensor (DVS) based on fiber optic on various surrounding material and water content. According to this investigation, different types of materials such as sand, soil, and cement with different values of water contents have varying refractive index and elasticities. Therefore, each material will have a different speed and value of frequencies. A sensing structure of single mode fiber (SMF) has been used as the vibration sensor to detect the frequency and the vibration amplitude on the oscilloscope. The output from this research can be used for further study in practice as a further sensitivity improvement still necessary for the popular distributed submarine acoustic detection.

Keywords: Distributed vibration sensing; Optical fiber; Single Mode Fiber (SMF)

I-CReST 2023:167-131 - Cellulose Agro-Waste for Potential Bio-packaging

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ABSTRACT

Million tons of food and materials get spoiled daily worldwide because of storage and transportation issues, pointing out packaging systems inequalities. To ensure the quality of packed food products and nutritional supplements among available measures, packaging remained an important event and had been refined from time to time to provide a standard. Parallel to the introduction of the National Green Technology Policy by the government of Malaysia on alternatives to solve energy and environmental issues through green technology, it is our interest to develop a new class of materials from agro waste sources that can contribute towards the advancement of eco-friendly and sustainable materials for packaging applications with enhanced barrier, thermo-mechanical, rheological and antimicrobial properties. The bio-packaging was designed using cellulose based biodegradable film. The biofilm was evaluated based on the mechanical, structural, surface, and chemical properties to confirm the suitability of the biofilm as food packaging. Different fruit and vegetable were packed in a container at three different environments; 1) control, 2) covered with PE film and 3) covered with biofilm. It was observed that the samples packed with the biofilm demonstrate better freshness and lower moisture content as compared to that of control and container with PE. Naturally renewable materials used in this present work have potentials to replace current synthetic plastic and can be commercialized in the market of environmentally friendly food packaging.

Keywords: Biofilm; Cellulose; Antimicrobial; Food packaging

I-CReST 2023:175-155 - Feasibility Study of Sea Sand in Producing Lightweight Tiles

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ABSTRACT

The construction industry is growing with major trust on infrastructure and demand for sand is also increasing. The overuse of natural sand for construction has many undesirable environmental and social consequences. The natural sand deposits are depleting and illegal sand mining is becoming crucial issue. The impact of illegal procedures contributed many problems such as river bank erosion, river bed degradation, river buffet zone encroachment and deterioration of water quality and groundwater availability. In this research, sea sand sample from different location is determined and its properties are discussed. The unwashed sea sand has been used as alternative to replace silica sand in producing lightweight tiles. The results show that unwashed sea sand have a potential value for producing lightweight tile application which is the chemical composition of sea sand is 95.10% of silica content.

Keywords: Chloride content; Lightweight tile; Sea sand

I-CReST 2023:178-286 - The Development of Low Clay Whitewares Using Prefired Material

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ABSTRACT

The development of anti thermal shock whiteware ceramic bodies using a prefired material as the main ingredient. The prefired material used was a newly constructed mixture of selected mineral oxides. After firing at the peak temperature of 1300ºC with 180 minutes soaking it exhibited a low CTE value of 4.4 x 10-6 per ºC and developed dense regions of sufficient size which were large enough to produce the aggregates. In this study, a whiteware ceramic body was formulated with 75 wt. % prefired material of two median sizes and plastic-bonded with 25 wt. % clay which comprised of equal proportion of a kaolin and ball clay. At the fired lower temperature of 1050ºC with 60 minutes soaking, the formulated body showed a low CTE value of 4.6 x 10-6 per ºC. The fired formulated body was also found to have 1.9% water absorption, significant translucency and good whiteness as well as passed the quench test.

Keywords: Anti-thermal shock whiteware; Prefired material; Thermal shock resistant

I-CReST 2023:179-179 - Production of Glass-Grade Silica Sand from Ex-tin Mine Tailing Sand

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ABSTRACT

Ex-tin mine tailing sand refers to the residual mineral remaining after tin extraction. It exhibits high silica (SiO_2) content, ranging from 94% to 99.5%. For industrial and manufacturing applications, deposits of silica-yielding products of at least 95% SiO_2 are preferred. This study aimed to increase the silica content by reducing impurities in order to meet the minimum requirements of the glass-making industry. The sample used was the ex-tin mine tailing sand from Kampar, Perak. Extensive experiments were carried out to optimise the application of various processes, namely gravity and magnetic separators, sieving, grinding as well scrubbing. The characterisation of the raw sample shows that it exhibited a higher SiO_2 content in the coarser fraction (below 4 mm and above 850 µm) at 97.51%, while the finer fraction (below 850 µm) contained 92.89% of SiO_2. In this study, the highest product composition for the coarser fractions resulted in 99.05% SiO_2 content, accompanied by 0.041% Fe_2O_3, 0.62% Al_2O_3 and 0.023% TiO_2. On the other hand, the finer fractions achieved the highest composition of 99.21% SiO2, with 0.040% Fe_2O_3, 0.30% Al_2O_3 and 0.063% TiO_2. These findings highlight the successful application of the identified processes in producing glass-grade silica sand from tin tailing sand, offering potential economic and environmental benefits in utilizing this resource for glass industry.

Keywords: Silica sand; Ex-tin mine tailing sand; Glass-making industry

I-CReST 2023:190-212 - Role of Plasticizers on the Enhancement of Ionic Conductivity in Solid Polymer Electrolytes-based CMC-NH_4NO_3

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ABSTRACT

Solid electrolyte is a vital component within a battery system that serves as a membrane or solid separator for ion migration between electrodes. In this work, the effect of chemical modification using different plasticizers was investigated on solid polymer electrolyte (SPE) based carboxymethyl cellulose (CMC) doped with ammonium nitrate (AN). Three different types of plasticizers namely, ethylene glycol (EG), ethylene carbonate (EC), and glycerol (Gly) were selected for preparing SPE films by solution casting technique. The films were characterized using electrical impedance spectroscopy (EIS) for ionic conductivity and electrical properties studies. The optimized ionic conductivity for each SPE system was achieved at $(3.80 \pm 0.06) \times 10^{-2}$ Scm^{-1}, $(1.47 \pm 0.18) \times 10^{-2}$ Scm^{-1} and $(9.75 \pm 0.04) \times 10^{-4}$ Scm^{-1} with the addition of 20 wt. % of EG, EC while Gly was at 15 wt. %, respectively. Dielectric and modulus studies revealed the behavior of each SPE system and supported the plots shown by conductivity. The EG-plasticized SPE system exhibited the highest ionic conductivity compared to other systems based on the results obtained in this work.

Keywords: Polymer electrolytes; Carboxymethyl cellulose; Ammonium nitrate, Plasticizer

I-CReST 2023:192-172 - Comparative Study on Properties and Biodegradation of Starch-Based and Gelatin-Based Bioplastics

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ABSTRACT

For the past few decades, pollution resulting from conventional or petroleum-based plastics has emerged as a global issue. The adverse impacts of these non-biodegradable polymers have prompted a growing focus on the research and advancement of environmentally friendly bioplastics. In this study, the comparison of starch-based (tapioca, corn, potato, and wheat) and gelatin-based bioplastics will be carried out and assessed. The composition of the starch bioplastic samples mentioned are optimized and made with the same starch:glycerin:vinegar:water weight ratio which is 6:5:5:50 respectively meanwhile the gelatine bioplastic samples are made with gelatine:glycerin:water weight ratio of 4:1:20. Each mixture is heated and stirred for 3 minutes and then poured into a glass petri dish taking account of same thickness and volume. After drying in the oven at 55 °C for 24 hours, the samples are measured and cut into pieces with dimension of 3 cm x 4 cm. Later, the appearance and surface morphology of the bioplastic samples will be carried out using optical microscope while its structure elucidation will be done using Fourier Transform Infrared Spectrometer (FTIR) and UV-Visible Spectrophotometer (UV-Vis). Biodegradation analysis was also carried out to determine the rate of breakdown for all synthesized bioplastic samples in soil.

Keywords: Bioplastic; Gelatin; Pollution; Starch

I-CReST 2023:193-160 - Preparation and Characterization of Gold Nanoparticles/Silica Composite Film Immobilized on Anodized Aluminium Oxide-Glass Substrate

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ABSTRACT

Gold nanoparticles have been widely studied as heterogeneous catalysts to assist many catalytic reactions due to their high stability and good reusability. Hence, a gold nanoparticles/silica composite film (AuNPs/silica) on various substrates were fabricated in this study via sol-gel method by adding a medium comprised of dry ethanol, deionized water, and hydrochloric acid to gold(I) pyrazolate complex ($[Au_3Pz_3]C_{10}$TEG) according to the ratio of $[Au_3Pz_3]C_{10}$TEG/ [TBOS]/ [EtOH]/ [HCl]/ [H_2O] = 1:60:504:10:1.2:266. Next, 70 μL of the sol-gel solution was spin-coated or drop-casted on substrates such as glass, anodized aluminium oxide (AAO) or mixture of both AAO-glass in which the quality of all resulting films was compared. Interestingly, it was found that [Au3Pz3]C_{10}TEG/silica fabricated on combination of both AAO-glass substate gave the best quality based on its surface thickness, layer uniformity and film brittleness. Later, the resulting film was treated with thermal hydrogen reduction at 210 °C for 2 hours to produce AuNPs/silica_AAO-glass film. To confirm the quality and successful synthesis of gold nanoparticles in the film, the film was further characterized by using Ultraviolet-visible (UV-vis) spectroscopy, scanning electron microscopy, X-ray diffraction (XRD) analysis and transmission electron microsopy.

Keywords: Anodized aluminium oxide; Glass; Film; Gold nanoparticles

I-CReST 2023:195-150 - Physical Properties of Fired Clay Brick Adding Waste Materials as A Fluxing Agent

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ABSTRACT

The purpose of this study is to reduce the amount of clay soils that compose most of the sample clay bricks.In this study, clay mixtures were mixed with used glasses and seashells. Clay soils (CS), soda lime silica glass (SLS),and seashells (SS) were combined in mixtures using the empirical formula (1-x) [40 SLS - 60 CS], where *x* (SS) = 0 - 40 wt%. 21% of water was added to a batch of 40 g mixture after it had been made. The mixes were blended thoroughly before being placed into brick-sized rectangular molds that measured 74 mm (*l*) x 30 mm (*w*) x 24.3 mm (*h*). It was then dried for 48 hours at room temperature. The samples then underwent a drying process in anelectrical oven for 1 hour at 45 °C. Dried samples were heated to 850 °C and maintained there for one hour using a laboratory electrical furnace at a rate of 6 °C/min. The physical properties of clay bricks were examined in relation totheir waste shell content. According to the findings, the apparent density of clay bricks increased from 1.912 g cm^{-3} to 2.306 g cm^{-3}, and water absorption increased from 12.29% to 18.16%. With the addition of more SS, the apparent porosity percentage fell from 86.87% to 25.17% and apparent specific gravity decreased gradually from 2.92 g cm^{-3} to 1.94 g cm^{-3} respectively.

Keywords: Clay brick; Clay soil; Waste materials; Soda lime silica glass; Sea shells

I-CReST 2023:203-158 - Modifying Physical Properties of Soda Lime Silica-Based Fired Clay Brick with Clam Shells

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ABSTRACT

In this research, agricultural wastes such as soda lime silica glass, and clamshell were used to create sustainable fired clay bricks. The substitution of waste materials is purposely to fabricate glass waste-based fired clay bricks incorporated with clamshell and to identify the effect of a clam shell on the physical properties of the fired clay bricks. Numerous clamshell concentrations were added to the fired brick, followed by the sintering process, and then the physical properties were examined. The addition of clamshell variably increased water absorption, increased the mass loss of ignition of the clamshell-based bricks, and dramatically decreased the plasticity and shrinkage meanwhile the density was increased. From each concentration, 40wt% of the clamshell was functioning at its optimum by having the highest water absorption.

Keywords: Fired clay bricks; Soda lime silica; Clam shell; Waste materials

I-CReST 2023:206-161 - The Effect of Different Weight Percentage of Arachis hypogaea on the Corrosion Behavior of AISI 1020 Steel

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ABSTRACT

Recently, the demand for natural corrosion inhibitors has increased tremendously due to environmental concern and their effect on human health. This paper investigates the effect of different weight percentage of Arachis Hypogaea that act as corrosion inhibitors to AISI 1020 steel. Arachis Hypogea waste or groundnut shell was extracted with 3 different weight percentage which is 10% (AH 10%),20% (AH 20%) and 30% (AH 30%) to produce natural corrosion inhibitor extract using Soxhlet extraction process. The extracts were then used as natural corrosion inhibitors for two different solutions which are 1M NaCl (Alkaline environment) and 1M HCL (Acidic Environment). The samples underwent corrosion weight loss process for 7,14 and 21 days for each of the weight percentage. Macrostructure and corrosion layer thickness was also observed and measured before and after corrosion weight loss test. The findings for weight loss test confer that AH 30% has lowest weight loss values compared to other types of samples immersed in both NaCl and HCl solutions. The results also indicated that longer immersion times resulted in higher weight loss for all different weight percentage samples. However, the samples immersed in HCL suffer severe weight loss compared to samples that were immersed in NaCl. The macrostructure observation results showed that samples immersed in NaCl and HCL solutions were severely deteriorated compared to samples immersed in natural corrosion inhibitors solution. In conclusion, the development of Arachis Hypogaea as natural corrosion inhibitors had successfully protect the surface of AISI 1020 steel as lower weight loss values were obtained.

Keywords: Arachis Hypogaea; Natural corrosion inhibitors; AISI 1020 steel

I-CReST 2023:217-170 - Superconducting Properties of ZnS added $Bi_{1.6}Pb_{0.4}Sr_2CaCu_2O_8$ Superconductor

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ABSTRACT

The bismuth-based high temperature with composition $Bi_{1.6}Pb_{0.4}Sr_2CaCu_2O_8$ $(ZnS)_x$ (Bi-2212) was prepared via solid-state reaction method with x = 1 to 3 wt. %. The samples were characterized using the four-point probe electrical resistance measurements, AC susceptibility, X-ray diffraction and field emission scanning electron microscopy (FESEM). The addition of ZnS showed no changes in the orthorhombic structure and microstructure. ZnS added samples recorded the highest transition temperature ($T_{c\ onset}$ = 85 K). All samples exhibited superconducting properties. Sample with x = 0 wt. % showed the highest peak transition (T_p) of the imaginary part of the AC susceptibility. The critical current density at T_p was between 22.5 and 31.3 A cm^{-2}.

Keywords: AC susceptibility; Zinc sulfide; Microstructure; X-ray diffraction

I-CReST 2023:219-174 - Morphology Effect of Zinc Oxide on Nonlinear Optical Properties for Soliton Mode-locked Fiber Laser

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ABSTRACT

In this work, zinc oxide (ZnO) with different morphologies was synthesized to examine the effect of morphology on the nonlinear optical properties. The impact of this effect on the performance of mode-locked pulsed fiber laser was further investigated. The ZnO particle-like and flake-like were prepared using the sol-gel and hydrothermal methods. The twin detection technique explored the nonlinear optical properties of both ZnO samples. The ZnO flake-like sample exhibited higher modulation depth and saturation intensity and lower non-saturable loss than the ZnO particle-like sample. Consequently, the 1.9 μm mode-locked pulsed fiber laser generated by utilizing the ZnO flake-like based saturable absorber (SA) has demonstrated a better performance relative to its short pulse width, high SNR value, high pulse energy, and high efficiency. The results of this work could give a valuable guideline for selecting the appropriate nanomaterial-based SA for various photonics applications.

Keywords: Zinc oxide; Flake-like morphology; Particle-like morphology; Saturable absorber; Mode-locked pulsed laser

I-CReST 2023:227-189 - Extraction of Ferulic Acid from Lemongrass Leaves using Hydrothermal Treatment

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ABSTRACT

Ferulic acid, which is the most abundant hydroxycinnamic acid found in plant cell walls is known for its anti-microbial, anti-inflammatory and antioxidant properties, making it a highly sought after compound for various applications especially in cosmetic and pharmaceutical industries. In this study, hydrothermal treatment was used to extract the ferulic acid from lemongrass leaves which was conducted using laboratory autoclave and miniclave. A 2^3 full factorial design was adopted in this study and three parameters were varied namely temperature (°C), time (min) and substrate/water loading (%). The results showed that both models for autoclave and miniclave were significant with Prob F value less than 0.05 and the most significant factor was temperature. The optimum pretreatment conditions for autoclave and miniclave were at taemperature of 130 and 150°C, substrate water loading at 30 and 10 % for 180 and 10 min which corresponded to 48 and 76 mg/L of ferulic acid extracted, respectively. In conclusion, miniclave have shown superiority over autoclave based on less amount of substrate and shorter time required with higher amount of ferulic acid obtained.

Keywords: Lemongrass leaves; Ferulic acid; Hydrothermal; Pretreatment

I-CReST 2023:262-231 - Chemical Constituents from the Leaves of *Macaranga hosei* (Euphorbiaceae)

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ABSTRACT

Macaranga hosei, is a species from the Euphorbiaceae family with the vernacular name *Purang* and *Benuah*. This species is usually found in Peninsular Thailand, the Malay Peninsula, Sumatra and Borneo. *M. hosei* grows swiftly in bright light and can reach several hundred feet. In primary forests with large openings and damaged or logged regions, it persisted for 30 years. It has been used to cure stomachaches, fungal infections, fever, coughs, and tonsillitis. This study was conducted to investigate the chemical constituents from the leaves part of this plant. The methanol extract of the leaves of *M. hosei* was subjected to fractionationusing vacuum liquid chromatography (VLC) with the solvent system *n*-hexane:ethyl acetate, resulting in twenty semi-purified fractions. Based on TLC analyses, fractions 3, 6 and 7 were combined for further purification using column chromatography with the solvent system chloroform:ethyl acetate, which yielded two pure compounds. The compounds were elucidated based on spectroscopic data of NMR, IR and UV as well as the comparison with previous literature. The known compounds were determined as β-sitosterol (**1**) (16.8 mg) and 4-nitroanisole (**2**) (14.3 mg).

Keywords: *Macaranga hosei*; Euphorbiaceae; β-sitosterol; 4-nitroanisole

I-CReST 2023:265-236 - Phytochemical Constituents from the Leaves of *Macaranga heynei* (Euphorbiaceae)

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ABSTRACT

Euphorbiaceae is one of the largest spurge families of flowering plants. The species of Macaranga are abundant in terpenoids, stilbenoids, and flavonoids. It has been reported that the isolated compounds from this genus demonstrated potential bioactivities such as cytotoxicity, antimicrobial, and antiplasmodial activities. Macaranga heynei was selected to be phytochemically studied as this species was reported to contain prenylated dihydrostilbenes with potent anticholinesterase and antioxidant activities. The aim of this study is to isolate prenylated dihydrostilbenes from the leaves of Macaranga heynei using several chromatographic methods and to elucidate the isolated compounds using various spectroscopic techniques namely Ultraviolate-visible (UV), Fourier Transform Infrared (FTIR) and Nuclear Magnetic Resonance (NMR). The ground leaves of M. heynei were macerated in methanol for 24 hours at room temperature and repeated three times. The resulting crude extract was diluted with aqueous methanol before being partitioned into n-hexane and ethyl acetate. The ethyl acetate fraction (150 g) was fractionated using vacuum liquid chromatography (VLC) with the eluent n-hexane:ethyl acetate to give seven combined fractions. Fraction 3 (463.9 mg) was further purified by column chromatography (CC) with the mixture of chloroform: ethyl acetate in increasing polarity to afford two pure compounds 1 (3.1 mg) and 2 (17.7 mg). Based on the various spectroscopic analyses such as NMR, UV and IR as well as the comparison with literature data, the pure compounds were elucidated as a new compound Q (1) and a known compound, laevifolin B (2).

Keywords: *Macaranga heynei*; Euphorbiaceae; Dihydrostilbene; Compound Q; Laevifolin B

I-CReST 2023:272-241 - Poly(Ethylene Oxide)/Poly(*n*-Butyl Methacrylate) Solid Polymer Electrolytes: Thermal Properties and Morphology

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ABSTRACT

The solution casting method was employed to prepare solid polymer electrolytes comprising poly(ethylene oxide) (PEO), poly(*n*-butyl methacrylate) (PnBMA), and lithium perchlorate ($LiClO_4$). A series of thin films with selected blend compositions of PEO/PnBMA were prepared at various mass ratios; 100/0, 80/20, 50/50, 20/80 and 0/100 with different salt concentrations, W_S = 0.005, 0.0099, 0.019, 0.048, 0.065, and 0.091. The thermal properties of these PEO/PnBMA polymer electrolytes were analyzed using differential scanning calorimetry (DSC). Specifically, the investigation focused on the glass transition temperature (T_g), melting temperature (T_m), and crystallinity (X^*) of the systems. The T_g results revealed that PEO and PnBMA, with and without the addition of salt, displayed immiscibility across all compositions. The T_g of PEO in the blends increased up to a salt concentration of $W_S \leq 0.02$ before declining, primarily due to salt saturation. The introduction of a small amount of PnBMA into the systems resulted in a slight decrease in the apparent T_m, particularly at high salt content ($X_S > 0.02$). Additionally, an observation was made that higher salt content ($W_{PEO} \geq 0.5$) led to a suppression in the crystallinity (X^*) of PEO. This suggests that at low salt concentrations and PEO content, the addition of salt does not significantly affect the crystallinity of PEO. To examine the morphology of PEO in the blends, polarized optical microscopy (POM) was employed. The morphology studies indicated the presence of fibrillar spherulites of PEO, particularly when PEO was present in excess. With the addition of higher amounts of PnBMA, the incorporation of PnBMA phase within the spherulites of PEO became more apparent. Furthermore, the addition of salt resulted in a reduction in the growth rate of PEO spherulites, leading to coarser and less birefringent spherulite structures.

Keywords: Poly(ethylene oxide); Poly(*n*-butyl methacrylate); Polymer blends; Polymer electrolytes; Thermal; Morphology

I-CReST 2023:274-255 - Optical Frequency Comb Generation and Switching in Silicon Microresonators under the Influence of Two-Photon Absorption

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Abstract

The generation of optical frequency combs in high-quality Kerr-nonlinear microresonators has the potential to unleash the use of optical switching. Strong material nonlinearity is one of the most important obstacles to producing really practical optical switching devices. A strong material nonlinearity is essential for achieving low optical switching power. However, due to silicon's relatively weak nonlinear optical properties, silicon-based optical switches require a tremendous amount of switching power. To address this limitation, an optical switch is developed using a microresonator structure made of silicon, and the switching action is demonstrated using nonlinear effects driven by a soliton pulse. The soliton pulse causes free-carrier concentration via a two-photon absorption effect, which increases the refractive index change and nonlinearity of silicon. The silicon microresonator then accumulates the switching-required nonlinear phase shift.

Keywords: Optical frequency combs; Optical switch; Microresonator; Two-photon absorption; Silicon photonics

I-CReST 2023:276-291 - Structural and Electrical Studies of Acylated Chitosan based Polymer Electrolytes

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ABSTRACT

By using the acylation method to react chitosan with acyl groups of various acyl lengths, acylated chitosans of various molecular weights were created. Gel permeation chromotography (GPC) was used to characterise the produced acylated chitosans and determine their molecular weight. Using the solution casting approach, films of acylated chitosan-based polymer electrolytes integrating various weight concentrations of sodium iodide (NaI) were created. Electrical impedance spectroscopy was used to examine how the molecular weight of the electrolyte systems affected their conductivity performance (EIS). The maximum conductivity of 6.56 x 10^{-6} S cm^{-1} was achieved for the lowest molecular weight of acylated chitosan. The effect of molecular weight and also the salt concentration on the conductivity behavior is discussed on the basis of the number density, mobility and diffusion coefficient of charge carriers. Transport parameters calculated using the impedance spectroscopy method is in agreement with those obtained using FTIR and XRD.

Keywords: Acylated chitosan; Molecular weight; Gel Permeation Chromotography; Electrical Impedance spectroscopy

I-CReST 2023:301-279 - Tensile Property of FRP Composites and Metallic Material through Tensile Coupon Test (TCT)

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ABSTRACT

FRP and metallic materials have a wide range of tensile property and to accurately describe the property, material specification and sample fabrication must be presented in detail. The purpose of this study is to provide a comparison with required sample specification and fabrication in tensile property of GFRP, CFRP, Hybrid FRP, AFRP, BFRP and MS through experimental. Mechanical testing was performed with 50 kN UTM and flat coupon grip fixture according to EN ISO 527/ ASTM D638. Results show that the average tensile strength of T-MS was highest with 485.20 MPa followed by T-HB (314.22 MPa). Mono FRP plate materials have shown that T-AF was the strongest among all 4 FRP plates followed by T-CF, T-BF and T-GF (279.43 MPa, 199.89 MPa, 198.25 MPa and 169.51MPa). All FRP material samples exhibit sudden fracture at different maximum strain with GFRP providing largest strain before fracture while MS sample exhibit strain softening due to necking before fractured. In general, based on the stress strain curves, all FRP materials behave like brittle material and metallic materials behave like ductile materials, which exhibit large strain before fracture. GFRP in general failed through breakage and fibers pulled out of resins while CFRP failed with angled cracked, and fibers mostly remain within matrix resins. Hybrid FRP composed of GFRP and CFRP have provided failure by inclined crack with fiber breakage and sign of fibers pull out of resin. AFRP material exhibits scattered cracking failure with fibers remain within the matrix resins while BFRP failed with shear fiber breakages with fibers remain with matrix resin. The metallic material represented by mild steel sample has provided fractured with necking indicating clear sign of ductile failure.

Keywords: Tensile strength; Maximum strain; Yield strength; Modulus Young; Failure modes

I-CReST 2023:316-284 - Photovoltaic Charging Station

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ABSTRACT

This photovoltaic charging station was developed for the purpose of teaching aids related to the generation of electrical energy from renewable energy sources. The problem of the cost for purchasing and maintenance of solar trainer teaching aids in an institution is generally a major factor in the development of this research study as it is designed in a small size, thus economic, easy and light weight to carry for demonstration or teaching purposes at class or any suitable location. This affordable teaching aid can be built as an effort to help the student that enrol DET30053 Power System Course about the conversion of natural source to electrical energy and off-grid switching system applications. The method of this charging station development is to use a self-propelled photovoltaic system consisting of a series of photovoltaic solar panel connected to a main board that containing measuring meters, battery, power inverters, charge controllers and circuit breaker. Location is an important factor in carry out of this system because the higher sunlight obtained, the higher the electricity. Current flows from the battery to the charging module of each branch and stored in the lead acid battery and the charge controller acts to prevent overcharging to the battery. The results of this study show that the conversion of electrical energy using off-grid PV systems is effective, convenient and economical for the use of low-voltage electrical and electronic devices. Therefore, these teaching aids can help provide a clearer and more detailed understanding of the concepts of energy conversion and individual photovoltaic generation as well as provide ideas to students for applying renewable energy in everyday life.

Keywords: Teaching aid; Renewable; Solar panel; Charging station; Off-grid

BIOLOGICAL SCIENCES

I-CReST 2023:013-002 - The Population Structure of Mangrove Gastropods from Kuala Selangor Nature Park, Selangor

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ABSTRACT

This study reports on population structure of mangrove gastropods from Kuala Selangor Nature Park sampled from August to November 2017. The line transect with quadrat method was employed to sample the gastropods in 5m x 5m quadrats. Gastropod collection was from roots, stems and branches of trees and mangrove floor. Nineteen gastropod taxa from seven families were recorded from the Bruguiera, mixed (Bruguiera, Avicennia and Rhizophora) and Avicennia and Rhizophora zones. *Avicennia* sp. recorded larger Girth at Breast Height (GBH) (mean=37.3±18.2 cm) while *Bruguiera* sp. recorded the smallest GBH (mean=22.36±8 cm). The Ellobiidae (*Ellobium aurisjudae* and *Cassidula aurisfelis*), Potamididae (*Cerithidea obtusa*, *C. cingulata* and *Telescopium telescopium*), Muricidae (*Chicoreus capucinus*) and Naticidae (*Nerita balteata*) were the most distributed gastropod families at the study site. *Cerithidea obtusa* (0.13 no/m2), *T. telescopium* (0.10 no/m2), and *N. balteata* (0.9 no/m2) were the most abundant gastropods sampled. The Margalef's species richness (D=2.90) and Shannon-Weiner diversity (H'=2.32) was low while Pielou's evenness (J=0.777) was relatively high. The size frequency distribution indicated juvenile, ageing and stable gastropod populations. In conclusion, there was clear horizontal and vertical distribution of the gastropod taxa but gastropod density between sampling zones did not vary significantly. Further studies of their role in the coastal food chain, as bioindicators of habitat change and as potential food source are needed.

Keywords: Population; Gastropods; Mangrove; Kuala Selangor Nature Park

I-CReST 2023:033-014 - Assessing Soil Carbon Sequestration Potential of Pristine Montane Heath Forests in Imbak Canyon Conservation Area (ICCA), Sabah, Malaysia

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ABSTRACT

A study was conducted to assess soil carbon sequestration in the Imbak Canyon Conservation Area (ICCA), Sabah, Malaysia. This study aimed to evaluate carbon sequestration potential at the pristine montane heath forest in the gazetted conservation area. In our research, the lowland dipterocarp forest in the Nepenthes trail is in the transition to the heath forest and it is characterized by sandy soil texture in layers 0-20 cm. A soil sample with three replicates for each sampling point is taken as vertical depth increment undisturbed cores with 20 cm depth extracted with a soil auger. The samples were analyzed for Total Carbon (TC), Nitrogen (N) and Total Organic Carbon (TOC). Firstly, TC and N were measured simultaneously on LECO CN928 Combustion Analyzer. The TOC was determined using the rapid dichromate oxidation method adapted from the Walkley-Black procedure. The Nepenthes trail representing the montane heath forest has exhibited extremely low TN and TC with 0.876% and 0.006%, respectively. The soil bulk density amounted to 1.486 g cm^{-3}, indicating poor soil carbon retention. The high C/N ratio amounted to 146 may lead to prolonged decomposition and contributes to low SOC content of the soil in the Nepenthes trail. Nonetheless, these findings are expected to facilitate addressing any threats to soil restoration and subsequently contribute to land management methods and strategic plans of ICCA.

Keywords: Soil organic carbon; Montane heath forest; Bulk density; Imbak canyon

I-CReST 2023:091-086 - Valorisation of Kombucha Biocellulose and Vegetable Waste as Sustainable Paper Production

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ABSTRACT

The demand for paper is steadily increasing, with daily use for many purposes. Unfortunately, the pulp and paper industries are taking a toll on the environment. Hence, there is a need for an alternative paper manufacturing process. This study determined the potential of kombucha biocellulose or bacterial cellulose (BC) and vegetable waste (VW) as alternative materials for sustainable paper production. BC was produced by two types of kombucha, green tea (GT) and black tea (BT), for 15 and 30 days (15d; 30d) of incubation. After harvesting, the BCs were purified to remove unwanted materials. Meanwhile, VW, which are onion peel (OP) and carrot peel (CP), was also purified to obtain pure plant cellulose. There are three formulations for biopaper production: (i) 25% BC + 75% VW; (ii) 50% BC + 50% VW; and (iii) 75% BC + 25% VW. The highest quality biopaper produced used the third formulation with the highest tensile strength (75% BC from GT-30d with 25% of both VW (OP & CP)), which were 0.10 and 0.14 MPa, respectively. The paper characteristics are stronger, thinner, foldable, stable and high-water resistance. However, it has lower tensile strength than standard office A4 paper (1.0 MPa) due to its thin characteristics, which are still not refined in the pulp phase. The surface morphology of the biopaper for the second formulation was analysed by Field Emission Scanning Electron Microscopy (FESEM). The surface structure of biopaper produced from 50% BC-GT-15d + 50% OP was smooth, with coherent peaks and no void. While the coarse and non-coherent peak for biopaper from 50% BC-BT-15d + 50% OP. In conclusion, this study shows that combining kombucha biocellulose and vegetable waste could be a promising material to replace the current pulp and paper production material. The best biopaper formulation with the highest BC percentage from GT kombucha fermented for 30 days with CP vegetable waste.

Keywords: Biocellulose; Vegetable waste; Biopaper; Tensile strength; FESEM

I-CReST 2023:098-144 - The Factors Associated with the Use of mHealth in Oral Health Care among Older People

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ABSTRACT

Elderly care is challenging as the ageing population increases and chronic diseases become more prevalent. Older people are prone to oral diseases like gingivitis, periodontitis, and edentulousness, which affect a healthy life, limit mobility, increase social isolation, and lead to poor quality of life and higher healthcare costs. As a result, it increases the burden on carers and healthcare systems. There are significant challenges to accessing and maintaining good oral health, like a lack of health literacy, limited resources, inadequate monitoring, and preventive care. mHealth is the use of mobile devices like smartphones, tablets, and wearable sensors to improve health outcomes, healthcare services, and public health. It is claimed to be an increasing concern in medical research. But it also poses challenges like limited accessibility to technology, limited mobile literacy, self-efficacy, trust, socio-economic support, and patient engagement. Elderly patients' acceptance of technology via mHealth is low. Less research has been done to draw systematic conclusions about the elderly's intention to adopt mHealth services. The Unified Theory of Acceptance and Use of Technology (UTAUT) was established and utilized as a conceptual framework in several types of research to study a larger range of variables that may impact how older people utilize and accept mHealth services. The barriers need to be identified to ease the adoption of mHealth in oral health care among older people. The findings of the studies have important implications for improving the quality of health care, especially in oral health, among older people.

Keywords: mHealth; Oral health care; UTAUT; Older people

I-CReST 2023:099-055 - Association of Food Allergy with Other Types of Allergies among Lactating Mothers

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ABSTRACT

Prevalence of allergy occurs with its multiplicity symptom and accentuate a complex interaction between genetic predisposition and environmental factors. Some allergy reactions, such as atopy and asthma, food allergy and allergy rhinitis, coexist with inexplicable and complex interactions. The objective of this study was to determine the maternal atopic presentation using self-perceived method together with specific-Immunoglobulin screening from maternal serum. Cow and soy milk are known as the two common sources of food allergen to trigger allergy reaction among infants and adult in Malaysia. Thus, this study also determines the prevalence status of cow and soymilk allergy through specific- Immunoglobulin E (s-IgE) screening. Besides, the relationship of the prevalence based on self-perceive and IgE screening also determined in the study. N=83 lactating mothers were participating in the survey across Malaysia. However, only n=36 mothers were volunteer for blood screening procedures represent only from two districts, Kuantan Pahang and Dengkil, Selangor. Through self-perceived methods, the most common allergy and symptom manifested by the mother was allergy rhinitis with 25% followed with sneezing in the morning with 21%. In addition, from 15 listed allergen in the study, only 11 were manifested to cause allergy among them. Dust and mites were the most common allergen among mothers with 34% followed with seafood with 18%, insect bites with 13%, peanut with 6%., cow milk with 2% and soy with 1%. Based on laboratory testing using ImmunoCAP 100 with CAP RAST (Radio-allergo-sorbent Test), from n=36 maternal serum, specific IgE to cow milk (Cow Milk IgE) ranged from 0.10 to 0.48 kU/L with mean±SD of 0.251±0.09 kU/L and specific IgE to soy (Soy IgE) ranged from 0.02 to 0.22kU/L with mean±SD of 0.127±0.04. From specific allergen test to cow milk and soy, n=7(19.4) of the mother was positive with cow milk allergy but none for soy allergy. As the laboratory testing determined only two types of food allergy, the data only showed the relation between these two-allergy prevalence. Other than that, a self-perceived data is only useful to briefly represent the allergy symptoms. Thus, laboratory diagnosis is important to ensure the prevalence to proceed with allergy management. Besides, this study also showed the relationship between the allergy prevalence and its uniqueness presentation between individuals which may be due to gene-gene interactions and gene-environment interactions cause by environmental exposure.

Keywords: Cow milk allergy; Soy allergy; Self-perceive; Clinical diagnosis

I-CReST 2023:119-094 - Comparison of Rice, Corn and Potato Starch as Coating Toward Postharvest Quality of *Carica papaya*

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ABSTRACT

The study experimentally investigate the effect of different starches on prolonging the shelf life of *C. papaya* and postharvest quality including skin colour changes, sugar content, weight loss and disease incidence severity. Even though *C. papaya* one of the most favourable tropical fruits, there are still no solutions to secure the problems occur during postharvest procedures. Besides, most fruits and veggies are coated with chemical coating thus it will give impact on the state of the fruits and even to human health. Thus, edible coating such as rice, corn and potato starches are required to analyse and determine which of them able to pioneer the objectives of the studies. Plasticizers are prepared through water bath for 45°C with 20 minutes and cooled down under room temperature before mixed together with the starches. The *C. papaya* are coated with different starches and left under room temperature for a week and data are recorded. In the end, *C. papaya* with corn starch coating able to secure the postharvest quality of the fruit than other starches. The *C. papaya* are mostly free from diseases and able to preserve their weight loss especially during transportation of fruit. Aside from that, corn starch is an edible coating therefore it is safe to be consumed or use wildly in preserving the postharvest quality and slowing down the ripening.

Keywords: *C. papaya;* Postharvest quality; Shelf life prolong

I-CReST 2023:131-112 - Micropropagation of Shoots of *Orthosiphon stamineus*: The Comparison of Silver Nanoparticles Synthesis from Field-grown and *in-vitro* Shoot Culture

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ABSTRACT

Orthosiphon stamineus (*O. stamineus*) is an herb plant with high antioxidant properties and has been reported to treat several diseases such as, diabetes and simple urinary tract infection (UTIs). The antioxidant compounds in *O. stamineus* are responsible for reducing and capping processes during silver nanoparticles synthesis. The manipulation of the phytochemical content in the *O. stamineus* plant can be achieved by a tissue culture system. Therefore, this study aimed to optimise shoot biomass by manipulating 6-benzylaminopurine (BAP) concentrations using axenic shoot culture. Nodal segments were cultured on Murashige and Skoog (MS) plates supplemented with 1–7 mg L-1 BAP for 6 weeks and subcultured fortnightly. The aqueous were extracted and analyzed for total phenolic content (TPC), total flavonoid content (TFC), and antioxidant activities (DPPH and FRAP). UV-Visible spectroscopy and transmission electron microscope (TEM) were used to characterize the formation of silver nanoparticles (AgNPs). Results showed that nodal explants treated with 4 mg L-1 BAP produced the highest number of shoots (15.80 ± 0.76) and shoot length (6.63 ± 2.32 cm). The highest total phenolic content (TPC) was obtained when shoots were treated with 1 mgL-1 BAP which was 17.05 ± 0.34 GAE mg/g. However, the 4 mg L-1 BAP treatment induced the highest total flavonoid content (TFC) of 10.13 ± 0.21 QE mg/g. As for antioxidant assays, the highest FRAP value (7200.00 ± 103.02 µM Fe (II)) and the lowest EC50 (56.65 ± 0.17 µg mL-1) were obtained for 4 mg L-1 BAP as compared to other treatments. In addition, surface plasmon resonance (SPR) showed in the range of 430 – 440 nm with a higher intensity (0.978) than field grown extract, which was at 0.417. Meanwhile, the silver nanoparticles (AgNPs) produced by wild-type extracts were spherical with diameters ranging from 29 to 80 nm. However, agglomerated AgNPs were observed for in vitro plant extracts. In conclusion, BAP-induced extracts of O. stamineus had successfully induced high antioxidant activities and AgNP formation but low in capping agents. Further investigation is needed to identify the phytochemical that serves as the capping agent in the synthesis of stable silver nanoparticles from in vitro shoot cultures of O. stamineus.

Keywords: *Orthosiphon stamineus*; Silver nanoparticle; Plant tissue culture

I-CReST 2023:132-091 - Metabolic and Molecular Effects of Cocoa on Obesity: A Review

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ABSTRACT

The obesity epidemic remains a significant public health concern and is associated with non-communicable diseases such as diabetes and cardiovascular disease. Cocoa has been identified as a potential nutritional intervention due to its polyphenols and flavanols compounds, which exert anti-obesity effects. This review aimed to investigate the metabolic and molecular responses associated with obesity and the association between cocoa and obesity. Cocoa treatment was found to improve insulin resistance, endothelial function, gut microbiota, blood pressure, and serum lipids. Additionally, cocoa positively influenced the PPARs transcription factor, leptin, TNFα, MCP-1, NF-κB, and AMPK pathways, which are associated with obesity-related metabolic dysfunctions. However, some studies have reported diverse results concerning insulin resistance, blood pressure, serum lipids, and PPARγ transcription factor following cocoa treatment. In conclusion, cocoa may be an effective nutritional intervention to reduce the risk of obesity and associated non-communicable diseases. Nevertheless, further research is required to determine optimal dosages and formulations for anti-obesity interventions.

Keywords: Obesity; Cocoa; NCDs; Polyphenols; Flavanols

I-CReST 2023:148-114 - Exercise and Hypertension: A Review on Exercise Recommendation, Mechanism of Action, Exercise-Related Risk and Innovative Exercise Approach

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ABSTRACT

Hypertension, commonly known as high blood pressure, is a condition in which the force of blood pushing against the walls of the arteries is consistently higher than normal. This condition can lead to serious health problems such as heart disease, stroke, and kidney disease. Hypertension is classified when Systolic Blood Pressure (SBP) is more than 140 mmHg and/ or Diastolic Blood Pressure (DBP) is more than 90 mmHg. Blood Pressure (BP) should be taken more than two times and space of one to two minutes apart in more than two occasion. The average reading will determine level of BP. Prehypertension is when SBP is between 120 mmHg to 139 mmHg and DBP is between 80 mmHg to 89 mmHg. The prevalence of hypertension in Malaysia remains high, despite the implementation of several policies aimed at addressing the issue. There has been minimal improvement among the Malaysian population in managing hypertension. The incidence of hypertension increased by 0.7% between 2006 and 2015, from 34.6% to 35.3%. There are several strategies that individuals with hypertension can adopt to manage their condition and engaging in physical activity is considered to be among the most effective non-pharmacological approaches. This review provides a detailed and comprehensive analysis of the exercise recommendations for hypertensive patients, and thoroughly explains the mechanisms through which exercise can impact blood pressure levels. Additionally, the review briefly touches upon the potential risks associated with exercise for hypertensive individuals, as well as innovative exercise approaches that may be beneficial for this population.

Keywords: Hypertension; Exercise; Physical activity; Exercise-related risk; Innovative exercise approach

I-CReST 2023:154-118 - Elucidating the Effects of Ionizing Radiation on Immune Cell Populations: A Mathematical Modeling Approach with Special Emphasis on Fractional Derivatives

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ABSTRACT

Despite recent advances in the mathematical modeling of biological processes and real-world situations raised in the day-to-day life phase, some phenomena such as immune cell populations remain poorly understood. The mathematical modeling of complex phenomena such asimmune cell populations using nonlinear differential equations seems to be a quite promising and appropriate tool to model such complex and nonlinear phenomena. Fractional differential equations have recently gained a significant deal of attention and demonstrated their relevance in modelling real phenomena rather than their counterpart, classical (integer) derivative differential equations.We report in this paper a mathematical approach susceptible to answering some relevant questions regarding the side effects of ionizing radiation (IR) on DNA with a particular focus on double-strand breaks (DSBs), leading to the destruction of the cell population. A theoretical elucidation of the population memory was carried out within the framework of fractional differential equations (FODEs).Using FODEs, the mathematical approach presented herein ensures connections between fractional calculus and the nonlocal feature of the fractional order of immune cell populations by taking into account the memory trace and genetic qualities that are capable of integrating all previous actions and considering the system's long-term history. An illustration of both fractional modeling, which provides an excellent framework for the description of memory and hereditary properties of immune cell populations, is elucidated. The mathematics presented in this research hold promise for modelling real-life phenomena and paves the way for obtaining accurate model parameters resulting from the mathematical modeling. Finally, the numerical simulations are conducted for the analytical approach presented herein to elucidate the effect of various parameters that govern the influence of ionizing irradiation on DNA in immune cell populations as well as the evolution of cell population dynamics, and the results are presented using plots and contrasted with previous theoretical findings.

Keywords: Ionizing radiation effects; Immune cells; Fractional derivatives; Double-strand breaks

I-CReST 2023:155-119 - The Establishment of Disease-Free Planting Material of *Ananas comosus* Cv. MD2 (JengkaPine) via Direct Organogenesis using Sucker Explants

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ABSTRACT

JengkaPine is an MD2 pineapple brand exclusive to the Universiti Teknologi MARA (UiTM) Pahang Branch Jengka Campus. Similar to other pineapple varieties, JengkaPine is having issues with multiple rot diseases caused by bacterium and fungi, resulting in significant revenue loss. One option for overcoming this difficulty completely is to eliminate the pathogens at the earliest stage of propagation using plant tissue culture technology. This paper describes a plant tissue culture procedure through direct organogenesis to obtain disease-free planting materials for JengkaPine using sucker explants. Direct organogenesis was obtained through the culture of explants on modified MS media supplemented with 40.0 g/L sucrose and different concentrations and combinations of plant growth regulators such as BAP, NAA, myoinositol, kinetin, and IAA. The organogenesis of MD2 JengkaPine was investigated in three phases: initiation, multiplication, and rooting. The optimum shoot initiation was observed on MS + 2.0 g/L BAP and MS + 3.0 mg/L BAP after 12 weeks with a total of 5–6 shoots per culture, while clonal shoot multiplication was found optimal on MS medium added with 3.0 mg/L BAP with a total of 12 shoots. MS + 1.0 mg/L IAA was ideal for rooting MD2 JengkaPine clonal shoots, giving a total of 28 roots after 12 weeks. Improvement in phytophthora-reduced contamination during surface sterilization was also investigated.

Keywords: *Ananas comosus* L. cv. MD2 (JengkaPine); Disease-free plantlets; Organogenesis; Plant growth regulators

I-CReST 2023:157-124 - Enzymatic Pretreatment of Waste Bread for Glucose Syrup Production

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ABSTRACT

One of the pre-treatments developed to separate monosaccharide from starch polymerization is enzymatic hydrolysis. There is an abundance of leftover bread from bakeries and homes, and this waste can cause carbon dioxide to build up in the atmosphere. According to this study, due to their high carbohydrate content, expired breads can be used as a source of glucose or a substrate for a variety of industrial processes, including the production of ethanol and organic acids. The expired bread was heated for 15 minutes prior to the gelatinization process, which was then followed by the liquefaction and saccharification processes. Different temperatures, enzyme concentrations, and reaction times were used during the liquefaction process, whereas different temperatures and reaction times were used during the saccharification process. FTIR and UV Spectrophotometer were used to analyse sugar concentrations. The highest concentration of glucose yield during the liquefaction process was found to be at 50°C, 6% w/v, and 180 minutes, according to the study on glucose syrup concentration yield. Following the liquefaction process, the highest glucose concentrations were found at 60°C after 60 minutes of the saccharification process.

Keywords: Enzymatic hydrolysis; Carbohydrate; Liquefaction; Saccharification; Waste bread

I-CReST 2023:174-169 - Biodegradation of Microplastics by Plastic-degrading Bacteria: A Systematic Review

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ABSTRACT

Plastic has been prevalent due to its unique properties, such as flexibility and cost-effectiveness. Once the plastic waste is released into the environment, it can degrade over time, producing many smaller plastic fragments called microplastics (MPs). MPs pose a global threat to ecosystems and human health due to their extensive use and accumulation in the environment. This study aims to review the scientific literature on MPs in the environment and identify the strategy towards managing the MPs for the foreseeable future. Degradation of MPs using microbes such as bacteria has grasped the attention of researchers around the globe to study microbial strategy to enhance MPs degradation in the environment as it is an eco-friendly alternative. In this study, online science database (such as Scopus and Science) has been used to investigate the biodegradation of MPs in the environments by narrowing it down to 'Biodegradation', 'Degradation', 'Freshwater Biology' and 'Microplastics' categories. More than 100 articles involving MPs pollution and biodegradation by bacteria were published between 2017 and 2023 were identified. Thus, the articles were reviewed and revealed that while MPs in marine have been the subject of extensive scientific researches, the extent of MPs pollution in terrestrial environments and the interactions of MPs towards human health remain poorly understood. The microbial strategy of bacteria to degrade MPs in the environment and the factors that affect the process also needs more understanding and information. Hence, this article reviewed current knowledge regarding the sources, distribution, pathways, and risks associated with MPs contamination in the terrestrial and marine environment, including adverse effects on human health. The article also focuses on the several steps mechanism of biodegradation, factors influencing biodegradation and existing species of bacteria to degrade MPs. This work will be a reference for new researchers to use this effective strategy for plastic pollution removal.

Keywords: Microplastics; Toxicity; Biodegradation; Plastic-degrading bacteria

I-CReST 2023:196-151 - Dried *Curcuma longa* L. Rhizomes Reduce the Incidence of Leukaemia Rats via the Reduction Level of Bcl2 to Bax Ratio Transcripts in Blood

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ABSTRACT

This study was aimed at evaluating the preventive effects of high dose supplementation of dried *C. longa* rhizomes in *N-Methyl-N-Nitrosourea* (MNU)-induced leukaemic rats. A total of 64 adult male Sprague Dawley rats (> 2.5 months old) with an average weight of 200-300 g were subjected to acclimatization for two weeks. All rats were divided into four groups (A, B, C and D) at week 0. Group C and D rats were administered a total amount of 240 mg/kg body weight of MNU, intraperitoneally. Rats in Groups B and D received 5000 mg/kg body weight of dried *Curcuma longa* rhizomes. Rats in Group A were treated as the control. All the rats were sacrificed at week 20. Blood samples were examined for the presence of leukaemic cells and underwent RNA extraction for quantitative real time polymerase chain reaction (RT-PCR) assay. The blood smear examination revealed that all rats in Group C had 100% leukaemia as determined by the blast cells appearance, as opposed to Group D which had a slight reduction to 88%. The ratio of Bcl-2 to Bax transcripts in the blood was increased 3.3-fold (10.50±1.26) in Group C as compared to the control rats (3.17±1.07), which marked a high level of anti-apoptotic cells in this group due to leukaemia. Meanwhile, the ratio of Bcl-2 to Bax transcripts in Group D rats (3.58±0.82) was comparable with the control rats. Daily supplementation of dried *C. longa* at the dose of 5000 mg/kg of body weight significantly reduced the incidence of leukaemia via the reduction of blast cells incidence and the transcription ratio of Bcl-2 (anti-apoptotic gene) and Bax (pro-apoptotic gene) in the blood of MNU-induced leukaemia rats.

Keywords: *C. longa*; N-Methyl-N-Nitrosourea; Leukaemia; Bcl-2; Bax

I-CReST 2023:199-177 - The Effectiveness of Exercises in Management of Shoulder Impingement Syndrome: A Case Study.

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ABSTRACT

Shoulder impingement syndrome (SIS) is a very common cause of shoulder pain among the elderly, particularly in women. It has two distinct pathological conditions, which are subacromial and internal impingement. It can significantly influence the daily activities and quality of work of an individual with SIS. There are a wide range of physiotherapy approaches for patients with SIS, however, shoulder exercises are the best way to manage the pain and range of motion. The objective of this case study was to evaluate the effectiveness of shoulder exercises to treat patients with SIS. A 57-year-old female patient presented with shoulder pain due to a fall on the ground. The patient complained about difficulty lifting up her left shoulder, dressing, tying her hair, and driving. She had limited range of motion in her shoulder. The pain was moderate, and the NPRS score was about 7 out of 10. She was provided the shoulder exercises after a proper assessment. The case was reviewed for three weeks. The study finding shows a significant change in pain and range of motion. There was a reduction in pain and increase in range of motion of shoulder joint. This case study concluded that exercise alone had a beneficial effect on the patient with shoulder impingement syndrome.

Keywords: Shoulder pain; Impingement syndrome; Physiotherapy; Shoulder exercises

I-CReST 2023:221-200 - Effect of Carbon Source on Decolorization of Methyl Orange by *Ganoderma lucidum*

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ABSTRACT

Ganoderma lucidum is a red-colored species of *Ganoderma* with a limited distribution in Europe and parts of China, where it grows on decaying hardwood trees. The present study deals with decolorization of Methyl Orange dye by *Ganoderma lucidum*. This dye possesses detrimental effects to human and environment therefore, an efficient and eco-friendly method was develop to overcome this problem. *Ganoderma lucidum* was incubated at 27°C for 11 days, and the decolorization of 150 mg/L Methyl Orange was monitored using UV-Vis spectrophotometry. The effect of carbon source on optimal decolorization of Methyl Orange was studied by varying the carbon sources used which were 20 g/L glucose, 20 g/L galactose, 20 g/L lactose and 20 g/L starch. UV-Visible spectrophotometry spectrum showed that glucose was the best carbon source for *Ganoderma lucidum* as it decolorized Methyl Orange up to 92.5%. This result indicated that optimal condition of fungal growth could elevate its decolorization performance on pollutant.

Keywords: *Ganoderma Lucidum;* Methyl orange dye; Carbon source; Decolorization

I-CReST 2023:223-183 - Preliminary Phytochemical Screening of *Pavlova* sp., *Nannochloropsis* sp., and *Nanochlorum* sp.

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ABSTRACT

Phytochemicals are secondary metabolites with diverse biological activities. Besides plants, microalgae also reported to synthesized these compounds in their system. Microalgae are unicellular photosynthetic microorganism mostly live in aquatic habitat. The production of bioactive metabolites from microalgae offers many advantages. They have simple structure, grow faster and their cultivation is sustainable. The objective of the study is to compare the phytochemical constituent in different group of microalgae which are *Pavlova* sp. (Haptophyta), *Nannochloropsis* sp. (Eustigmatophyta) and *Nanochlorum* sp. (Chlorophyta). Microalgae cells at logarithmic phase were harvested by centrifugation, dried, ground into powder and extracted using ethanol. The extracts of microalgae were subjected to qualitative screening of different phytochemicals such as alkaloids, flavonoids, terpenoids, tannins, steroids, saponins and glycosides. *Pavlova* sp. Showed presence of glycoside, *Nannochlorospsis* sp. Contain terpenoid while *Nanochlorum* sp, positive flavonoid and terpenoid. Different group of microalgae contain different type of phytochemicals. These phytochemicals are potent active constituents with many health-promoting properties like antioxidants. Preliminary tests are the first step to detect the bioactive compounds and are based only on colour changes and precipitation. Additional quantification and further characterization can be conducted to confirm and validate the results.

Keywords: Microalgae; Phytochemical screening; Qualitative tests

I-CReST 2023:231-205 - Preliminary Study of Biomass Estimation in Som Forest Reserve in Jerantut, Pahang

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ABSTRACT

Tree biomass is a by-product of photosynthesis and carbon sequestration by trees. The study of biomass estimation is the assessment of the carbon stock of a forest in order to determine carbon accumulation and ecosystem yield. The Kyoto Protocol recognised tree biomass assessment as an important study to accurately quantify the carbon stock in the forest. Many researchers in Malaysia have conducted substantial research on the evaluation of forest biomass. The protected forest area in Jerantut district is around 0.37 million hectares. The biomass data in Pahang's Som Forest Reserve has not yet been investigated. The purpose of this study was to determine the biomass of trees in a Malaysian lowland dipterocarp forest at an elevation of 100-120 metres above sea level. Seven subplots with diameters of 20 m × 50 m were constructed, and trees having a diameter at breast height (DBH) greater than 5 cm were tagged and the DBH was recorded. The aboveground and belowground biomass were identified using a non-destructive method, which is biomass analysis applying the allometric equation developed by Kato (1978) and Niiyama (2010). The study plots contained 669 trees with a DBH greater than 5 cm. The diameter at breast height (DBH) of the trees in the research area ranges from 5.0 to 116.0 cm. In the Som Forest Reserve, the total basal area was 36.82 m2/ha. The overall aboveground biomass is 638.50 t/ha, and the total belowground biomass is 81.11 t/ha. The overall biomass assessed in this study is thought to be similar to prior studies.

Keywords: Biomass estimation; Forest; Pahang; Malaysia

I-CReST 2023:234-267 - Preparation and Physicochemical Characterisation of Fractionated Medium Chain Triglycerides Nanoemulgel Formulation

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ABSTRACT

Introduction: Celecoxib, a lipophilic nonsteroidal anti-inflammatory drug, has disadvantages due to poor bioavailability, first-pass effect, and difficulty to maintain effective concentrations via topical and trans-delivery. Due to high drug loading capacity and better skin penetration in comparison to other nanocarriers, nanoemulsion and nanoemulgel are shown to be excellent drug carrier systems for drug penetration through the skin for systematic effects. This study aims to formulate an optimal formulation that can overcome formulation solubility issues and traverse the skin barrier. For this purpose, nanoemulsion and nanoemulgel were formulated from fractionated medium chain triglycerides (FMCTs), namely MCT oil (F1) and PKOlein (F2). Physicochemical properties such as droplet size, polydispersity index, zeta potential and pH values were determined. Methods: From the screening study, nanoemulsions formulations containing 4% celecoxib, 25% surfactants mix (1:2, Tween80:Tween85), 72% deionized water with different FMCTs, while nanoemulgel formulations contained 1% celecoxib in 3% oil, and 75% of nanoemulsions 25% of hydrogel. The above compositions were selected to enhance the bioavailability for celecoxib drugs and increase the rate of absorption. Results: There were slight changes observed in the droplet size (~120-150 nm) and approximately value for polydispersity index before and after the modification of nanoemulsions (<0.25) in range using Carbopol 940. The zeta potential of the initial F1 and F2 are (-29.83±0.40 mV) and (-24.2±1.37 mV), respectively increased to (-43.70±8.25 mV) and (-48.83±3.21 mV), where it was proven to be sufficient for ensuring physical stability of nanoemulsion. Meanwhile, the pH values from all the formulations were within pH 4 to 6, or in the value range that is suitable for application on human skin as it can reduce side effects like irritation and dryness. The pH value of initial F1and F2 were (4.59±0.08) and (4.54±0.05) increased to (5.53±0.01) and (5.46±0.07) after the modification of nanoemulsions to nanoemulgels. Conclusion: Nanoemulsions and nanoemulgel having the above compositions possess advanced permeation characteristics are potential and promising vehicles for transdermal application.

Keywords: Celecoxib; Fractionated medium chain triglycerides; Nanoemulsion; Nanoemulgel; Droplet size

I-CReST 2023:236-235 - Anti-Inflammatory Mechanism of Cyanidin 3-Glucoside Based on Network Pharmacology

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ABSTRACT

Chronic inflammation involves the pathogenesis of complex diseases such as cardiovascular disease, cancer, and diabetes. Phytochemicals cyanidin 3-glucoside (C3G) possesses many health benefits and properties, such as anti-inflammatory and antioxidant. However, no study reported molecular mechanisms of its action. In this study, a network pharmacology approach was used to study the anti-inflammatory mechanism of C3G in the multiple inflammatory pathways. The SwissTargetPrediction was used to screen C3G molecular target and GeneCard was used to identify inflammatory gene targets. A Venn diagram was constructed to illustrate the relationship between C3G and inflammatory genes to obtain common genes. The hub genes were screened using STRING and cytohubba in Cytoscape to investigate protein-protein interactions (PPI). Gene ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) enrichment analyses were performed on hub genes using ShinyGO. Finally, molecular docking was performed to assess the interaction between C3G and these targets. From the results, a total of 92 common genes between C3G and inflammatory gene target was obtained. The network complex included 92 nodes and 442 edges. Ten hub genes were identified that involve in anti-inflammatory of C3G including (AKT1, TNF, EGFR, SRC, PTGS2, HIF1A, MMP9, KDR, MMP2, and MCL1. The anti-inflammatory activity of C3G involves regulation of proteoglycans in cancer, endocrine resistance, relaxin signaling pathway, VEGF signaling pathway, pathway in cancer, and microRNAs in cancer. Molecular docking analysis showed a strong interaction between C3G and these targets. In conclusion, this study provides knowledge on anti-inflammatory mechanism of C3G through multiple regulatory pathways.

Keywords: Anti-inflammatory; Cyanidin 3-glucoside (C3G); Molecular docking; Network pharmacology.

I-CReST 2023:243-213 - The Influence of *in vitro* Colistin Exposure on Whole Genome Sequence and Protein Structure in Clinical *Acinetobacter baumannii*

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ABSTRACT

Acinetobacter baumannii is a Gram-negative coccobacilli and is one of the top priority threats among the ESKAPE pathogens. Due to its high genome plasticity, it is able to rapidly evolve and acquire resistances towards antibiotics such as colistin, a last resort drug. The objective of this study is to describe the mutational impacts on the protein structures after extended exposure to sub-lethal concentrations of colistin. *A. baumannii* isolates (Ab10) obtained from HUSM Kubang Kerian, Kelantan were cultured and exposed to daily incremental sublethal concentrations of colistin based on CLSI and EUCAST standards. Whole genome sequencing and analysis were performed using the Illumina NovaSeq 6000. The genomic structures of both susceptible and resistant strains were compared. The variants detected were called and filtered using Galaxy. The effects on genes and proteins were predicted with SnpEff ver. 5.1. The 3D models of proteins were generated using SWISS-MODEL and Robettato to determine the impact mutations on protein structure. DogSiteScorer and PyMOL were used to predict the potential binding pockets and its changes. Four missense variants with moderate impact on the encoded proteins of Ab10 were identified on three different proteins. Two significant proteins were further analysed. Acyl-CoA dehydrogenase; probable dibenzothiophene desulfurization enzyme with one mutation (c.631A>C, p.Thr211Pro) has two significant pockets identified. As for acetyl-CoA acetyltransferase (EC 2.3.1.9) @ 3-oxoadipyl-CoA thiolase (EC 2.3.1.174) with two mutations (c.334G>A, p.Val112Ile;c.84C>A, p.Asp28Glu), has one pocket with a significant drug score was identified from the protein sequence. Prolonged exposure to colistin in vitro has resulted in mutations outside of those reported in literature, suggesting a more complex mechanism of resistance. The impact of these mutations is varying and merit further study.

Keywords: Antimicrobial resistance; In silico; *Acinetobacter baumannii*; Protein; Whole genome

I-CReST 2023:245-211 - Impact of Daily Incremental Sublethal Erythromycin Dosage on Whole Genome Sequence and Protein Structure in *Acinetobacter baumannii*

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ABSTRACT

Acinetobacter baumannii is a Gram-negative nosocomial bacteria with the ability to rapidly evolve antimicrobial resistance. It has been categorized as one of the top priority threats among the ESKAPE pathogens and can cause varying life-threatening infections. To predict the impact of mutations in *A. baumannii* proteins following erythromycin resistance induction. A susceptible clinical *A. baumannii* parent strain was acquired from storage in HUSM Kubang Kerian, Kelantan. Resistance induction was carried out through a series of daily sublethal exposure to erythromycin in Mueller Hinton broth (37°C overnight at 200 rpm) until growth was achieved at 8000x above the EUCAST MIC standard. Following paired-end sequencing (Illumina NovaSEQ 6000), assembly was carried out using Unicycler ver 0.4.8. Annotation was then done using RAST and PGAP, followed by variant-calling and annotation using Galaxy (UseGalaxy.org) and SnpEff. Protein structures were identified using SWISS-PROT, and AlphaFold was used to generate structures for proteins lacking reference models. Binding sites and potential impact of mutations were analyzed using DogSiteScorer and PyMOL. Snpeff variant-calling analysis revealed two high-impact, nine moderate-impact and 26 low-impact mutations. Eight out of 38 protein-coding sequences were identified to carry protein-coding missense, and out of 20 mutant mobile elements, only one is a transposase. From the list of target genes, four relevant protein targets were identified and screened for structural alterations; “low-affinity inorganic phosphate transporter”, “LSU ribosomal protein L22p (L17e)”, “two-component transcriptional response regulator, OmpR family” and “insertion element IS401 (*Burkholderia multivorans*) transposase”. Exposure to sublethal doses of erythromycin can result in the rapid development of mutations in *A. baumannii*. While mutations are varied, a large portion are low impact. Non-synonymous mutations, especially those in protein-coding regions are relatively rare, but can result in a significant impact on the protein structure and interactions.

Keywords: Antimicrobial resistance; In silico; *Acinetobacter baumannii*; Protein; Whole genome

I-CReST 2023:252-225 - Antibacterial Activity of Dissolvable CMC-AgNPs Patches as a Wound Dressing

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ABSTRACT

The incident of the dried dressing stuck on the dehydrated wound during treatment can cause bacterial infection, require frequent changing, and introduce a secondary injury to the healed tissue upon removal. Due to this limitation, there is a need to design a wound dressing that can be easily removed while regulating wound moisture and possessing a desirable antibacterial activity. This study prepared the dissolvable wound dressing patch from a mixture of silver nanoparticles (AgNPs) as an antibacterial agent loaded into the carboxymethyl cellulose (CMC) matrix. The one-pot solution of 2% CMC containing different concentrations of AgNPs (0.5%,1%,2%) was sonicated for 15 to 45 min and cast into the petri dish, followed by oven dried at 50°C for 24 h. The AgNPs' stability in the CMC, surface wettability, and bactericidal effect of the patches were tested using zeta potential (ZP), water contact angle analysis (WCA), and the disc diffusion method against *Staphylococcus aureus* and *Escherichia coli*. The result showed that the CMC with 0.5% AgNPs sonicated at 30 min exhibited the optimum AgNPs stability with its ZP, polydispersions index, and WCA values are -92 mv, 0.892, and 50.5°, respectively. Then, the dissolved patch expresses its bactericidal effect by producing a 10 mm inhibition zone for both pathogens. This study indicates that dissolvable CMC/AgNPs patches can be used for wound treatment as AgNPs were stabilized in the CMC matrix while exhibiting antibacterial properties with optimum surface wettability.

Keywords: Cellulose; Wound healing; Nanoparticles

I-CReST 2023:298-272 - Development and Consumer Acceptance of Dorayaki with Incorporation of Mango Peel Powder

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ABSTRACT

Peels of fruits is a common agricultural waste in the food chain system including mango peel. Mango peel powder is widely applied in noodle, bread, cake and biscuit as functional ingredients due to the high fibre, phenolic, carotenoid and ascorbic acid but none had been found in production of dorayaki. This study develop mango peel dorayaki incorporate with mango peel powder (10%, 20% and 30%) and to know the acceptability of panellist toward the product. The mango peel that received from the seller had been treat, dried and convert into a powder form using cyclone miller. Following that, the mango peel powder mix with other ingredients in making the dorayaki. Sensory evaluation test had been conducted for the three formulations with different percentage of mango peel powder. 40 number of panellists had been evaluated the dorayaki through scoring and hedonic test. All the data had been analysed using statistical software (SPSS). Panellist had evaluated the color, sweetness, taste and texture of the dorayaki. There is no significant different of sweetness but the color, taste and texture, panellists indicated the significant different. Overall acceptability in scoring and hedonic test, panellist choose formulation 2 as the best formulation. To conclude, dorayaki incorporated with the mango peel powder was successfully develop and acceptable by the consumer. The reuse of mango peel could reduce the waste and potentially become new income for the mango industries.

Keywords: Mango peel powder; Dorayaki; Sensory evaluation

I-CReST 2023:308-282 - Comparative Study on the Phytochemical Screening and Antioxidant Activity of *Melastoma malabathricum* and *Gynura procumbens* Extracts.

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ABSTRACT

Malaysia is blessed to have a variety of natural resources of plants that are highly beneficial for well-being.Plants are a rich source of natural phytochemical compounds such as secondary metabolites and antioxidant. Phenolic compounds are the richest secondary metabolites commonly found in both edible and non-edible plant. Antioxidants play an important role to protect damage caused by oxidation process. Plants having phenolic contents that are reported to carry antioxidant properties. The present study was designed to determine the antioxidant activities of aqueous leaves extract of *Melastoma malabathricum* (*senduduk*) and *Gynurap procumbens* (*sambung nyawa*). *M. malabathricum* usually used to treat diarrhoea, dysentery, hemorrhoids, cuts and wounds, toothache, and stomachache. Traditionally, *G. procumbens* commonly used in several countries to treat a wide range of health conditions, including kidney discomfort, arthritis, diabetes, constipation, and hypertension.. In this study, the sample was extracted using aqueous extraction. Next, the phytochemical screening test was done to determine the presence of tannin, terpenoids, steroid, phenolic, flavonoids and saponin content. The antioxidant activities in this study were determined by total antioxidant capacity, DPPH (1,1-diphenyl-2-picrylhydrazine) radical scavenging assay. From the phytochemical screening test of aqueous extraction of *M. malabathricum* showed the presence of phenolic, flavonoid, tannin, steroid but absence of saponin, tannin and steroid. Whereas, *G. procumbens* screening, *it shows presence of all phytochemical but absent of saponin.* The antioxidant activity expressed as IC_{50} ranged from 0.31mg/ml for *G. procumbens* and 0.42 mg/ml for *M. malabathricum*. The potency of radical scavenging effect of *G. procumbens* extract was greater than *M. malabathricum.* Further study is needed to identify and isolate the exact active compound underlying this high antioxidant activity.

Keyword: Phenolic compounds, Antioxidant, *M. Malabathricum, G. procumben*

I-CReST 2023:315-283 - An Investigation Into The Level of Knowledge and Attitude of Analgesics (NSAIDs and PCM) Use and Its Prevalence Among Undergraduate Healthcare Students in Malaysia

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ABSTRACT

Background: The widespread use of non-steroidal anti-inflammatory drugs (NSAIDs) and paracetamol (PCM) globally is noteworthy, and healthcare students must acquire substantial knowledge and a positive attitude regarding analgesic use. Healthcare undergraduates also exhibited a high prevalence of analgesic use. The primary issue is the uncertainty surrounding the level of knowledge and attitude of healthcare undergraduates towards the correct and safe use of analgesics, particularly NSAIDs and PCM. Objective: This study aims to explore Malaysian undergraduate healthcare students' level of knowledge, attitude, and prevalence of analgesic use. Methodology: A descriptive, cross-sectional study was conducted by using voluntary anonymous self-administered online structured questionnaires. 392 undergraduate students from different healthcare-related courses participated in this study. The socio-demographic characteristics of the participants were analysed using descriptive statistics, along with the prevalence using cross-tabulations, frequencies, percentages, means and standard deviations. The Chi-square test (level of significance, p-value <0.05 and 95% CI) was used to assess the association or relationships between socio-demographic profiles and the level of knowledge and attitude toward analgesic use. Results: There is a high prevalence (84.9%) of analgesic use among the respondents. The majority of the respondents possess a good level of knowledge (45.4%) and attitude (44.1%) when it comes to the use of analgesics. Conclusion: The prevalence of analgesics use, specifically NSAIDs and PCM is high among Malaysian undergraduate healthcare students. While the majority of them were found to have a good level of knowledge and attitude towards the use of analgesics, there is only a small difference in percentage with those with moderate knowledge and attitude. Hence, it is necessary to implement interventions aiming to decrease the prevalence of analgesic usage among these students and enhance their knowledge and attitudes.

Keywords: Knowledge; Attitude; Prevalence; NSAIDs; PCM

INFORMATION TECHNOLOGY, ENGINEERING & MATHEMATICS

I-CReST 2023:014-003 - Machine Learning Approach to Forecast Particulate Pollution (PM_{10}) in Urban Area

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ABSTRACT

Particulate matter, also known as PM_{10}, has been identified as the primary pollutant. This kind of pollution poses the most risk to human health since it may accumulate in unhealthful amounts. In the study of air pollution, the prediction of PM_{10} concentration plays an important role. This is because the problem of atmospheric pollutants is not a simple matter of controlling the emission sources, such as PM_{10} concentration, but instead depends on gaseous pollutants and meteorological factors. This research aims to determine which Artificial Neural Network (ANN) prediction model is the most accurate for PM_{10} levels. On an hourly basis, data were collected beginning in the year 2012 and continuing through the year 2018, including PM_{10} data, meteorological data such as wind speed, temperature, and relative humidity data, and gaseous pollutant data such as nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO), and ozone (O_3) data. The performance of a prediction model for PM_{10} that uses ANN reveals RMSE values of 1.0470 and an R^2 value of 0.9981. Therefore, it has been shown that the nonlinear model is highly capable of realistically expressing the nonlinearity of PM_{10} in the atmosphere without the need for any previous assumptions.

Keywords: Air Pollution; Particulates; Nonlinear; Meteorological variables; Malaysia

I-CReST 2023:016-034 - Soil Quality Index at Pasir Gudang Industrial Area

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ABSTRACT

Soil Quality Index (SQI) is a very useful and efficient method for assessing the quality of soil. It is a useful tool for communicating the information on overall quality of soil. Five soil attributes namely acidity (pH), Organic Matter (OM), Phosphorus (P), Potassium (K), and Electrical Conductivity (EC) have been combined to construct an index to represent the soil quality. Location characteristics were observed during the time of sampling, and it was categorised according to industrial, riverside residential and educational area. From the determination of heavy metals concentration, certain area especially nearby Pasir Gudang industry has recorded heavy metal concentration exceeded the world average value for a few types of heavy metal. Soil quality index at this area indicated that only one location recorded poor quality index whereas the other locations indicated good to average soil quality index.

Keywords: Soil quality index; Heavy metal; Soil contamination; Industry

I-CReST 2023:031-009 - Assessing Open and Distance Learning (ODL) Platform Using Electronic Customer Relationship Management (ECRM) Features: The Case of uFUTURE for UiTM

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ABSTRACT

ODL is an extension of e-learning which was created and developed to have direct or indirect influence on teaching and learning environment. ODL focuses on open access to education by offering flexible learning opportunities to individuals and groups of students. Today, ODL system growing fast because of the Internet development and revolution. To adapt with the current learning system, UiTM has developed an ODL platform named UFUTURE. As a new platform, UFUTURE has received tremendous positive feedbacks from its target users. In this paper, we discuss the findings of our study on the assessment of UFUTURE that was carried out based on 42 ECRM features. The assessment been conducted through structured web observation. Findings from this study can be used as guidelines in the process of improving the services of UFUTURE and as references for other institutes that are in the process of developing ODL platform.

Keywords: ODL; E-Learning; UFUTURE; ECRM; Distance learning

I-CReST 2023:031-041 - Learning Arabic through Virtual Classroom (LAVC) for Year Six

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ABSTRACT

Arabic education in Malaysian schools has taken a systematic turn to keep up with the need to comprehend the fundamental sources of Islam: the Quran, prophetic sayings, and other Islamic Sciences. Today, the Program Jawi, Quran, Arabic, and Fardhu Ain (JQAF) has substantially contributed to Malaysia's consolidation of Arabic education. From being an option, it was later declared mandatory for all Malaysian students in national primary schools through secondary school. In observation, during the learning process in the classroom, due to a large number of students in a school, teaching Arabic language can be challenging as there are no comprehensive virtual classroom that act as a platform that can be used to store learning materials, activities, assessments and others. Hence, this study is conducted responding to the issue. For this study, focus has been set for year 6 students as they are experienced students that has gone through five years learning Arabic language. The proposed virtual classroom is aimed at addressing the challenges faced year 6 students in Sekolah Kebangsaan Dato' Yahya Subban, Perak. The study highlights the need for a standardized approach to sharing teaching materials, activities, assessmnets and others through the virtual classroom. The study proposes using the Universal Design for Learning (UDL) theory and the Adapted System Development Life Cycle (SDLC) method. UDL has been chosen as it comprised of three theory components which are engagement, representation, action and expressions. The phases in the adapted SDLC are Planning, Analysis, Design, Development, Implementation, and Report. The virtual classroom was evaluated through a collaborative effort involving a supervisor, IT experts, Arabic specialists, and 30 respondents. The evaluation results showed that the virtual classroom developed meets the requirements and provides a positive learning experience for students.

Keywords: Islamic courseware; Multimedia courseware; Arabic language; Islamic class

I-CReST 2023:031-042 - Courseware of Islamic Adab for Year Two Students Based on UDL Principles

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ABSTRACT

KAFA Class is an abbreviation of Fardhu Ain Religious Class for primary students in few states in Malaysia. For KAFA Classes, there are eight to nine subjects been thought in class for year 1 to year 6 students. Since its presence, all subjects have been thought using traditional method (in class through face to face method by using text books and activities books). During the pandemic of Covid-19, teachers are facing difficulties in teaching online as there are very minimal source of teaching materials that be accessed through online. Hence, this study is conducted responding to the issue. For this study, focus has been set for year 2 students that taking Islamic Adab subjects. Sekolah Kebangsaan Tembak, Kedah has been chosen as focus KAFA Class. In this school, KAFA classes are held in the evening session everyday. The main objective for this study is to design and develop a standalone courseware for Islamic Adab for year 2 students. The design process starts with preliminary studies to gather information on courseware requirement from selected respondents (teachers and students) from Sekolah Kebangsaan Tembak, Kedah. The preliminary findings been mapped to Universal Design Learning (UDL) which focus on three main theory components which are engagement, representation and action and expressions. From there, ADDIE model had been applied in the development process. The phases involve in development process are analysis, design, developed, implement and evaluation. As to complete the testing phase, the courseware then undergoes a functionality and usability testing with the chosen respondents. Findings from the testing results indicates that the courseware developed meet all requirement set at the early planning stage and suitable to be used in teaching Islamic Adab for year 2 students.

Keywords: Islamic courseware; Multimedia courseware; Islamic adab; KAFA; Islamic class

I-CReST 2023:035-274 - Effectiveness of Physical Distancing during Congregational Gathering in Minimizing Airborne Pathogen Transmission

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ABSTRACT

This study focuses on the effectiveness of physical distancing during congregational prayer in a mosque using a computational fluid dynamics (CFD) approach. CAD modelling tool was used to make a 3D model of the mosque, the prayer area, and an assailant. CFD software was used to mimic the spread of pathogens during prayer meetings. The programme changed the distance between prayers, how the air moved, the temperature, and the amount of moisture in the air. To get accurate modelling results, a sensitivity analysis of the mesh was done, and a model of turbulent flow was chosen based on what was already known. Pathogens tend to move towards the right side of the front of the mosque, according to the models. Particle deposition showed that the most particles (1.3% of the total) fell on prayers that were in front of the attacker, especially at a distance of 3m, while the least particles fell on prayers that were on the side at all distances. Most of the dust fell on the roof and floor of the mosque. The results showed that as the distance between prayers went up, the number of times the virus could reproduce (R_o) went down. R_o values went from 3 (no physical distance) to 0 (physical distances of 3m and 4m), showing that transmission got weaker as distances got farther apart. The chance of infection was highest (26.63%) when there was no physical separation, and it was lowest (14.29%) when there was 4m of physical separation. In conclusion, the ability of droplet nuclei to stay in the air and move farther than 2m means that physical distance can successfully stop pathogens from spreading from one person to another.

Keywords: Airborne; Pathogen; Transmission; Numerical CFD; Distancing

I-CReST 2023:036-122 - Numerical Solver for Ordinary Differential Equations with Stiffness using 2-Point Extended Hybrid Block Method of Order 2

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ABSTRACT

This paper presents the development of the 2-Point Extended Hybrid Block Multistep of Order 2 (2EHBM(2)) method as a numerical solver for ordinary differential equations (ODEs) with stiffness, which involves an additional function evaluation at the second solution point. Theoretically, a higher number of evaluated functions can improve the accuracy of the numerical method. The main objective of this study is to analyze the convergence of the proposed method and ensure its capability to estimate solutions of ODEs to any required accuracy. To achieve this, necessary conditions for convergence, such as consistency and zero stability, are studied further. The efficiency of the 2EHBM(2) method is validated by comparing its accuracy and computational time with existing methods for solving stiff ODEs of different natures. The numerical experiments prove that the proposed method can be an alternative method for solving stiff ODEs.

Keywords: Hybrid block method; Singly diagonally implicit; Multistep method; Minimized error norm; Stiff ODEs

I-CReST 2023:038-027 - The Importance of E-Exercise Book Reinforcement in Partial Fraction Learning

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ABSTRACT

This research aims to identify and subsequently correct the problems faced by students in learning the decomposition of partial fractions. The results of the pre-quiz show that students do not understand how to decompose partial fractions. In this study, 10 Civil Engineering Diploma students were selected as a sample of the study. E-exercise book training is used as a form of training book in teaching and learning to solve problems faced by students during learning and teaching improper partial fractions. An interview instrument was used in this study. The research began with classroom observations during the teaching and learning process. A pre-quiz was administered before the e-exercise book was used as an intervention for 5 weeks. Quiz 1, quiz 2, and quiz 3 were administered after the implementation of the e-workbook among students. Then, students were interviewed after 3 quizzes. The findings of the study show that the e-exercise book successfully improves students' understanding of basic concepts and manipulative skills in learning improper partial fractions.

Keywords: E-exercise book; Partial fraction learning; PIKK

I-CReST 2023:039-015 - Secondary School Student's Attitude and its Effects on their Mathematics Achievement

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ABSTRACT

This study examines students' attitudes and motivation toward learning mathematics. The purpose of the study is to determine the relationship between the variables of students' attitudes toward mathematics and their motivation to learn mathematics. The study also addresses the question of how non-intelligence variables affect student achievement. To answer the research questions, a questionnaire was administered to 150 grade 4 students who were surveyed. From the results, the relationship between these two variables is shown to be significant. However, the variables did not seem to affect the students' performance. It appeared that although the students had a positive attitude towards the subject and were highly motivated to learn mathematics, their performance in the exam was still poor. In conclusion, students' attitudes and motivations are variables that are closely related but may have no influence on students' performance in the subject. Further research on this topic can include elements that might be related to students' academic progress.

Keywords: Mathematics achievement; Motivation level; Secondary school students; Students' attitude; Students' motivation

I-CReST 2023:044-023 - A Study on the Relationship between Game-Based Learning and Secondary School Students' Mathematics Achievement in SMK Kompleks Gong Badak

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ABSTRACT

Digital game-based learning (DGBL) is an instructional method that incorporates educational content or learning principles into video games with the goal of engaging learners. The teaching techniques in schools are mostly still teacher-centered where the practice of exercise and memorization of tips and formulas are emphasized in learning. This research aims to study the relationship between game-based learning and secondary school students' mathematics achievement in SMK Kompleks Gong Badak. This study employs a quantitative approach to research and a single cross-sectional design. A set of questionnaires were used in collecting the data. Data samples were collected from approximately 100 students in high schools. The result of this research shows that there is a relationship between the effect of game-based learning and secondary school students' mathematics achievement. Also, it indicated that there is a good perception towards game-based learning on mathematics achievement. Plus, this study shows that there is significance difference in the mean usage of game-based learning toward mathematics achievement between male and female students. Due to these significant results, it can conclude that game-based learning does affect students' achievement in mathematics. In addition, one of the most effective approaches to achieving a student-centered teaching and learning process by the usage of game-based learning.

Keywords: Game-based learning; Mathematics achievement; Effects; Perception; Gender usage

I-CReST 2023:047-021 - Students' Perceptions on Mathematics Problem-solving in Secondary School

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ABSTRACT

Problem solving is one of the important skills for students to cope as it will be applied in their career development and future. However, many students encountered difficulty with their school assignments related to problem-solving questions. This study was conducted to study perceptions on mathematics problem-solving questions among students in secondary school. The study used quantitative approach in a questionnaire for collecting data. 106 students from a secondary school located in Johor were selected as respondents. The questionnaire focused on the perceptions on mathematics in male and female students in problem-solving questions and the difficulties encountered by students in dealing with these types of questions. All respondents needed to identify the strategies or techniques on how to answer mathematics problem-solving questions. Both descriptive and inferential analysis were used to achieve the objectives for this study. The results showed that students had a moderate perception in mathematics problem-solving questions and both male and female students have the same perceptions on the questions. Students also encountered several difficulties to solve mathematics problem-solving questions and there is a significant difference on the difficulties encountered when answering the questions between male and female students. The highest technique chose by students to solve the mathematics problem-solving question was by remembering solutions that have been made before.

Keywords: Mathematics problem-solving; Secondary school; Students' perception

I-CReST 2023:053-026 - The Factors Affecting Students' Persistence to Enrol in STEM Education

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ABSTRACT

Science technology, engineering, and mathematics (STEM) education is vital in producing a highly skilled and knowledgeable Malaysian workforce to meet the demand for its industries. Malaysia aims to be a developed country that initiates the technology itself instead of just being a user. Despite this ambitious goal, STEM education in Malaysia faces challenges due to low enrolment in STEM elective subjects. This declining trend is transparent in secondary school since students are given the choice to either enrol in STEM education or any other stream provided. STEM elective subjects are viewed as tough and need critical thinking that may influence students to change to another stream after they have enrolled in STEM education. Due to this, the study focused on what factors may contribute to students' persistence in continuing to enrol in STEM education until they finish secondary school. Therefore, this study has specified three factors to be studied, which are self-efficacy, socioeconomic status (SES), and students' academic achievement towards their persistence to enrol in STEM education. Form 4 students who took STEM elective subjects in SMK Dang Anum have been selected as the population under study, and 80 respondents were selected to answer a series of questionnaires that comprised 40 questions in total. All the data was collected within a one-week time frame and further analysed through the statistical software SPSS by using Spearman's correlation test to find the correlation between each independent variable and the dependent variable under study. It was found that there is a positive relationship between self-efficacy, socioeconomic status (SES), academic achievement, and students' persistence to enrol in STEM education.

Keywords: Academic achievement; Self-efficacy; Socioeconomic Status (SES); STEM education

I-CReST 2023:054-028 - The Level to which Building Information Modelling (BIM) is Implemented in Malaysia's Construction Industry.

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ABSTRACT

A combination of technologies, procedures, and guidelines known as Building Information Modelling (BIM) enables numerous stakeholders to work together to design, build, and manage a facility in virtual space. BIM has evolved significantly as a concept throughout time and is now the "contemporary embodiment of digital innovation" in the construction sector. For owners, architects, engineers, contractors, and construction professionals to plan more effectively, design, construct, and manage buildings and infrastructure, a BIM execution plan is typically necessary. Therefore, the purpose of this study is to assess the diffusion of BIM among Malaysian construction companies. The collected data was analysed using a descriptive version of the Statistical Package for Social Sciences for Windows Version (SPSS) 29 software, such as mean score, percentage, and frequency. The survey found that 46.9% of respondents, from both the public and private sectors, are using BIM in their companies. This shows that more companies are starting to understand how important and helpful BIM is for construction projects. This is because, compared to earlier data showing only 13% utilisation of BIM in the construction industry, BIM application adoption in Malaysia's construction sector has grown to a higher percentage. However, the percentage of BIM usage in Malaysia is still low when compared to developed countries such as Singapore. One of the main reasons for this is that BIM has more than proven its worth in large projects by saving huge amounts of money by lowering operational and inventory costs. Implementing BIM becomes less appealing when operating costs and time commitments are considered. Investments must be made to hire experts and train current workers. Small and medium-sized construction companies are not as likely to recognise the long-term advantages of investing in BIM services; thus, they view this as an expense rather than an investment. Other than that, a lack of expertise, a lack of awareness, and a lack of cooperation between stakeholders also contribute to these issues.

Keywords: Building Information Modelling (BIM); Digital innovation; Application

I-CReST 2023:055-077 - Research on the Usage of Pocket Score Woodball Application Version 1

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ABSTRACT

This study aims to investigate the usage of the Pocket Score Woodball application during the first phase of its implementation. Woodball is a growing sport that requires precise scorekeeping, and the Pocket Score Woodball application was developed to provide a convenient and efficient solution to this need. The study collected data on the usage of the application, including the number of downloads, frequency of use, and user feedback. The results showed a positive response from users, with a high level of satisfaction with the application's ease of use, accuracy, and convenience. The study also identified some areas for improvement, such as incorporating more features to enhance the user experience. Overall, the Pocket Score Woodball application has shown great potential to improve the scorekeeping process in Woodball and enhance the overall experience for players, coaches, and spectators. The objectives are to assess the effectiveness of the application in improving scorekeeping accuracy and efficiency, to evaluate user satisfaction with the application's ease of use and convenience, and to identify areas for improvement based on user feedback and usage data. The study aims to make recommendations for future development and implementation of the application. The Pocket Score Woodball application was developed to improve the scorekeeping process in Woodball competitions. Traditional paper-based methods can be time-consuming and prone to errors. The effectiveness and user satisfaction of the application during the first phase of its implementation are unclear. Further research is needed to evaluate the application's impact on the Woodball community and identify areas for improvement. The study gathered information about the application's usage, such as the number of downloads, frequency of use, and user feedback. Users responded positively, with a high degree of satisfaction with the application's ease of use, accuracy, and convenience. The study also identified some areas for improvement, such as adding more features to better user experience. Overall, the Pocket Score Woodball app has shown enormous potential in terms of improving the scorekeeping process.

Keywords: User interface design; Woodball; Score system

I-CReST 2023:056-030 - Perspective of Mathematics Lecturers on Online Teaching

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ABSTRACT

The COVID-19 pandemic has led to the establishment of online education. However, educators are under a lot of stress because of online learning. Technology skills development and engaging online education are also requirements for lecturers. Examining Malaysian lecturers' opinions on online teaching and learning is the goal of this study. The responders to this survey are mathematics and statistics lecturers from Malaysian academic institutions. To gather information and data from respondents, a questionnaire survey is employed. Regression analysis, ANOVA, and the t-test are used to analyze the data. The results show that lecturers who favor online instruction think that using online resources to teach Mathematics and Statistics is easy and that online instruction has greater benefits.

Keywords: Online teaching; Regression; ANOVA; Covid-19; Pandemic

I-CReST 2023:057-078 - The Effectiveness of Game-Based Mathematics Learning among Secondary Students

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ABSTRACT

Game-based learning or educational games has established an alternative learning environment among students. It helps to improve students' knowledge and skill acquisition. Through game-based learning, it provides students with challenges and a sense of accomplishment. The challenge in teaching-learning mathematics subjects is student lack of problem-solving skills and lack of interest during the lessons. Therefore, this study aims to determine the effectiveness of educational games in learning mathematics among secondary school students. The pilot study was conducted in one of the secondary school districts of Seri Manjung, Perak. A cluster sampling technique was used which comprised 32 respondents of Form One. Quantitative data were collected from questionnaires and academic achievement tests. The Social Sciences Statistical System (SPSS) version 25 tool was used to analyze the data. The findings showed a significant difference in the student's achievement in learning mathematics by using educational games as their learning aids. Based on the results, it can be concluded that student's performance in mathematics improved after student participated in the educational game activity as a learning aid in the classroom. Therefore, it is advised that future studies will focus on several topics and increase the number of participants for educational games as learning aid in mathematics.

Keywords: Educational game; Mathematics; Academic achievement

I-CReST 2023:058-032 - Comparative Analysis of Holt-Winter and SARIMA Models in Forecasting Rainfall Amounts in Peninsular Malaysia

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ABSTRACT

Extreme climatic conditions, such as floods and droughts, are presenting Peninsular Malaysia with growing difficulties in water resource management. Predicting precipitation is essential for managing water resources and reducing the effects of such storms. Rainfall forecasting techniques such as the Holt-Winter method and Seasonal Autoregressive Integrated Moving Average (SARIMA) have been created in recent years. Nevertheless, the efficacy of these models in Peninsular Malaysia has yet to be properly examined. Thus, the purpose of this study is to assess the efficacy of the Holt-Winter technique and SARIMA in predicting rainfall in Peninsular Malaysia. From January 2010 to September 2019, data from two distinct stations, Senai and Pulau Langawi, were utilised for the study. The performance of the models was assessed using Mean Absolute Percentage Error (MAPE) and Root Mean Square Error (RMSE). The findings of the study demonstrated that both models accurately predicted Peninsular Malaysia's precipitation. Nonetheless, the SARIMA model outperformed the Holt-Winter technique in terms of overall performance. The SARIMA model takes into consideration the data's autocorrelation and seasonality, which is crucial for Peninsular Malaysia rainfall forecasting. The research discovered that the SARIMA model generated better accurate forecasts with lower MAPE and RMSE values. This study has major implications for Peninsula Malaysia's water resource management, agriculture, and catastrophe risk reduction initiatives. Accurate precipitation forecasts may assist policymakers and farmers with crop selection, irrigation management, and water allocation choices. In addition, the application of statistical models like SARIMA can enhance efforts to mitigate floods and droughts by offering early warning systems for catastrophic weather occurrences.

Keywords: Climate; SARIMA; Holt-Winter; Rainfall; Forecasting

I-CReST 2023:059-031 - Assessment of Ionic Species in Rainwater Toward pH Variability between Highland and Lowland in Malaysia

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ABSTRACT

The atmospheric heterogeneous reactions of reactive gases by converting gases into particles are the key processes of rainwater chemistry. A total of 1040 datasets from 52 weekly data on the cation, anion, and pH from two sites namely the highland and the lowland were purchased from Malaysia Meteorological Department (MMD). The highland and lowland are represented by Cameron Highland (CH) and Petaling Jaya (PJ), respectively. The objective of the study is to examine the variability of ionic species and pH in rainwater during wet fall-out events between highland (CH) and lowland (PJ), thus investigating the possible contribution of anions and cations toward pH concentration. As such, these objectives were achieved through descriptive analysis, the Mann-Whitney U test, the Spearman correlation test, and discriminant analysis. Only similar parameters are selected after pre-processing procedure for both areas. Specifically, pH, H^+, Na^+, K^+, Ca^{2+}, Mn^{2+}, Zn^{2+}, Cl^-, NO_3^-, and SO_4^{2-} was the only variables selected for this study in order to maintain the data validity. Overall, Mn^{2+} was the only variable that demonstrated significant differences (p<0.05) between CH and PJ. Results indicate that rainfall at PJ is more acidic than CH due to higher concentrations of Cl^-, $SO_4^{2-,}$ and NO_3^-. Additionally, pH in CH had a strong positive correlation with Na^+, K^+, and Ca^{2+} than Petaling Jaya due to atmospheric neutralizing reactions between the acids (HNO_3 and H_2SO_4) with alkaline compounds ($CaCO_3$, NaCl, and KNO_3) existed in suspended fine particles during dry and wet fall out. The confusion matrix (cross-validation) in discriminant analysis proved that the overall performances of anion, cation, and pH in rainwater chemistry between CH and PJ significantly differed with 94.32% classification.

I-CReST 2023:060-033 - A Comparison Analysis of SVM and Naïve Bayes for Sentiment Analysis on Public's Perception Towards Secondhand Smoke

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ABSTRACT

Secondhand smoke (SHS) comes from a burning cigarette or other tobacco product, that is exhaled by smokers. Diseases such as lower respiratory illnesses, impaired lung functions and lung cancer could potentially harm human's health conditions due to the exposure of SHS. Public smoking has become a common factor that leads to people exposed to SHS and this occurs in various public places such as restaurants, workplaces, schools and at home. Smokers were less likely approached by someone else asking them to not smoke and non-smokers usually keep their opinions about inhaling the smokes to themselves. Due to this, the opinions, and perspectives of the society regarding the issue of SHS is unclear. In this study, a sentiment analysis was conducted to extract positive and negative sentiments of users' Twitter posts related to SHS. The sentiment extraction was done using sentiment classification with Valence Aware Dictionary and Sentiment Reasoner (VADER) model. The scent and smell of the cigarette smoke, ban on public smoking and health concerns are the topics that contributes to the negative sentiments. Freedom to smoke, equal rights for smokers and ignoring people affected by SHS exposure relates to the positive sentiments. Predictive models were constructed using Naïve-Bayes and Support Vector Machine (SVM) machine learning classifiers to predicts the sentiments from the dataset. The best predictive model is SVM with 70:30 split data ratio with an accuracy of 96.37%. In conclusion, SVM performed better than Naïve-Bayes for sentiment analysis on public perception towards second-hand smoke.

Keywords: Sentiment analysis; Second-hand smoke; Naïve-Bayes; Support vector machine

I-CReST 2023:064-045 - Analyzing Students' Intention to Learn Data Analytics Using LMS during Covid-19 in UAE Higher Education Institutions: A Technology Acceptance Model Study

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ABSTRACT

This study examined the factors influencing students' intention to learn data analytics using Learning Management Systems (LMS) during the Covid-19 pandemic in the United Arab Emirates (UAE). Drawing on the Technology Acceptance Model (TAM), an online survey was distributed to students in Higher Education Institutions (HEI) in the UAE who had studied data analytics online. The survey evaluated the students' attitudes toward e-learning, their self-efficacy in using e-learning systems, and their perceptions of the usefulness and ease of use of the Learning Management Systems. Descriptive statistics, reliability analysis, and linear regression were used to analyze the data and test the four hypotheses. The study found that the use of Learning Management Systems was widely accepted among students and that it increased their self-efficacy in learning data analytics. Both male and female students reported that Learning Management Systems made it easier to manage their tasks and improved their practical learning assessments. The study provides recommendations for policymakers, practitioners and researchers in higher education institutions to improve the use of Learning Management Systems for online learning, specifically for data analytics courses.

Keywords: Learning management system; Technology acceptance model; Data analytics; Higher Education Institutions; Covid-19

I-CReST 2023:076-103 - Construction of an Item Bank using Rasch Analysis

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ABSTRACT

An item bank is a large collection of high-quality test items that have been analysed and systematically stored in a computer, making them easily accessible to exam setters. The purpose of this study was to develop a new item bank and to assess the validity and reliability of the final examination paper for a Statistics course taken by 344 students. The course included 7 structured questions, divided into 21 items. Rasch analysis was used to analyse the data, linking all item difficulties and students' measured abilities on the same linear scale. The results showed that the Statistics course was unidimensional, with a Cronbach's alpha value of 0.90, item and person separation greater than 2, and person and item reliability of 0.87 and 0.99, respectively. Nineteen items were found to fit the measurement model and were stored in the item bank, while two items were found to be misfits and require revision. In summary, a well-developed item bank can be extremely beneficial to exam setters by making test construction easier, faster, and more efficient, resulting in higher quality tests.

Keywords: Item bank; Rasch analysis; Reliability

I-CReST 2023:085-046 - The Selection of Preferred Textbook based on Dominance Method

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ABSTRACT

Calculus is a mathematics subject normally taught at the tertiary level. There are many calculus textbooks with different approaches and styles that have been published to cater to the needs of students. The selection of calculus textbooks is very important as it can help teachers and students to optimize their usage. Textbook selection problem is a type of multiple criteria decision-making problem as the selection is based on a number of criteria. Thus, ranking fuzzy numbers based on the area dominance method is used to rank the calculus textbook.

Keywords: Calculus textbook; Ranking Fuzzy numbers; Area dominance

I-CReST 2023:100-096 - A New Approach in Mitigating Adversarial Attacks on Machine Learning

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ABSTRACT

Machine learning is a powerful tool that has the potential to transform many industries, and thus is open to security attacks. Such attacks on machine learning algorithms are known as adversarial attack. Adversarial attacks are designed to deceive or mislead machine learning models by introducing malicious input data, modifying existing data, or exploiting weaknesses in the algorithms used to train the models. These attacks can be targeted, deliberate, and sophisticated, and can lead to serious consequences, such as incorrect decision-making, data breaches, and loss of intellectual property. Poisoning attack, evasion attack, model stealing, and model inversion attacks are some examples of adversarial attacks. At the moment, most of the researchers are focusing on defence approach to mitigate these attacks. This approach aims to create a strong defense system that can detect and respond to attacks in real-time, prevent unauthorized access to systems and data, and mitigate the impact of security breaches. Unfortunately, such approach has some disadvantages and one of them is limited effectiveness. Despite the use of multiple defense measures, determined attackers can still find ways to breach systems and access sensitive data. This is due to the nature of defence approach which never trail the root of the problem and thus can lead to repetition of such attacks. In this paper, a new approach is proposed i.e. by using the forensic approach. The proposed approach will investigate attacks against machine learning and identify the root cause of the attack, determine the extent of the damage, and gather information that can be used to prevent similar incidents in the future.

Keywords: Machine learning; Adversarial attack; Defense approach; Forensic approach

I-CReST 2023:104-061 - Methodological Concerns in Developing Malaysian Adolescent's Profile on Mental Health

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ABSTRACT

The adolescent years are a crucial period for mental and social development, and the profile of Malaysian adolescents in terms of their mental health has significant implications for their education and social outcomes. Mental health issues such as anxiety, depression, and stress are prevalent among Malaysian adolescents; and these issues can negatively impact their academic performance and overall well-being. Mental health problems can affect concentration, memory, and motivation, that may distract adolescents from doing well in school. Poor mental health may also influence social interactions and relationships, which can impact their ability to form healthy friendships and family relationships, communicate effectively, and function in society. The development of mental health profile of Malaysian adolescents is critical to their success in education and social development. Educators and communities can help adolescents thrive academically and socially, leading to positive long-term outcomes, by addressing mental health issues and providing the required support. Developing a mental health profile for teenagers requires a rigorous approach to ensure that the results are reliable and valid. This paper addresses this issue by discussing methodological concerns that researchers should address in the development of mental health profile of Malaysian adolescents. The concerns focus on issues related to account sampling, validity of measures, bias, ethical concerns, longitudinal design, data analysis, and generalizability. The discussion aims to guide researchers to develop measures that are reliable, valid, and generalizable to the population of interest.

Keywords: Adolescent; Mental health profile; Methodology; Sample

I-CReST 2023:104-062 - A Dual-Factor Model to Develop Malaysian Adolescent's Profile on Mental Well-being

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ABSTRACT

The problem of mental well-being among adolescent is becoming more and more worrying because one in every seven individuals shows the existence of the problem even though many are not aware of it. Symptoms such as depression, panic, anxiety at an extreme level interfere adolescent' activities in learning and developing their potential to function in society. Intervention programs to raise awareness to deal with the problem effectively are still under-implemented. Furthermore, proactive actions to address mental well-being problems should be taken to empower adolescent by developing skills to deal with conflicts and strengthen family institutions. For the proactive approach, an understanding of how adolescent's background information and their mental well-being level needs to be created in the form of a adolescent's profile on mental well-being. Therefore, the objective of this paper to propose and discuss a dual-factor model of Malaysian adolescent's profile on mental well-being. The model guides in the development of adolescent's profile on mental well-being. Eventually, the profile aims to help teachers, school administrations and agencies to identify preventive measures and actions for adolescent at risk.

Keywords: Adolescent; Mental health profile; Model; Background information

I-CReST 2023:104-063 - Promoting and Assessing Collaborative Learning using Learning Analytics in Higher Education– Drivers and Wheels

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ABSTRACT

Learning analytics is the process of collecting, analysing, and reporting data about learners and their contexts to optimize the learning and teaching experience. Learning analytics leverages the use of technology to gather and analyse data about student performance, engagement, and learning behaviours, which can help educators make informed decisions about how to improve learning outcomes. In higher education, learning analytics can provide insights into student engagement, performance, and learning pathways. Collaborative learning in higher education involves a group of students working together towards a common goal or task. Collaborative learning encourages students to work together to solve problems, analyze information, and make decisions. Through discussion and debate, students develop critical thinking skills and learn to approach problems from different perspectives to enhance problem-solving skills. Collaborative learning provides opportunities for students to work with others from diverse backgrounds, helping them develop interpersonal skills such as communication, teamwork, and leadership. While collaborative learning helps students to foster critical thinking and develop interpersonal skills, students activities and engagement in collaborative learning are not properly assessed and measured. Student performance indicators are highly dependent on the learning activities and resources used in the learning management system based on indivual basis. The ability and potential of learning analytics to track students behavior and performance in team, and to monitor the effectiveness of their sharing and communication is not fully utilised in higher education. This paper addresses this issue and aims to propose collaborative learning analytics framework. The framework elaborates essential elements in collaborative learning and defines features in analytics to support collaborative learning. The framework is expected to guide to educators and developers in promoting and assesing students performance based on collaborative works.

Keywords: Learning analytics; Collaborative learning; Higher Education; Framework

I-CReST 2023:105-072 - Developing a Compact and Portable Metal Bending Machine: An Ansys Structural Analysis

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ABSTRACT

This project aims to design and develop a mini metal bending machine that is practical, affordable, and suitable for small-scale metalworking projects. The machine is designed to bend various materials with accuracy and ease while being compact and portable. The machine's base frame is made of 5mm thick mild steel, providing stability and strength. Its assemble by using the MIG welding technique. The bending process uses three steel rollers, two on the lower frame and one on the upper frame, with a handle attached to the roller of the vertical frame for manual operation. The machine's design includes a simple kinematic system that reduces design complexity, making it easy to use and maintain, while ensuring accuracy and consistency in bending metal strips into curves and other curvature shapes. To ensure the machine's reliability and safety, finite element analysis (FEA) was conducted using ANSYS software to evaluate the machine's structure under different loading conditions and identify areas of high-stress concentration that could lead to failure. The analysis confirmed that the machine's design is structurally sound and can withstand the expected loads during operation. The mini metal bending machine increases accuracy while maintaining affordability and portability, reducing human effort and requiring less skill to operate. However, compared to standard metal bending machines, it has lower capacity and less power, limiting its ability to bend thicker or larger metal pieces. Improving the machine's capacity and power while maintaining affordability and portability is an area for future development.

Keywords: Mini metal Bending machine; Metalworking; Bending technology; Small-scale fabrication; Portable bending machine

I-CReST 2023:105-073 - Design and Finite Element Analysis of a Cooking Oil Collector Machine Structure for Efficient Collection and Recycling

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ABSTRACT

Used oil is a hazardous waste that can have a significant impact on the environment if not disposed of properly. Recycling used oil is a cost-effective and environmentally friendly way to manage this waste material, as it can be refined into new lubricating oil or used as a fuel. An oil collector machine is a specialized piece of equipment designed to efficiently and effectively separate and purify used oil, removing impurities and contaminants and restoring the oil's chemical properties. This machine plays a vital role in the process of collecting and recycling used oil, ensuring that it is properly treated and reused, and reducing the amount of waste that goes into landfills or the environment. The oil collector machine is typically constructed from mild steel to produce a durable and stable frame structure. It is powered by an 18-volt solar panel with 30 Watts of output power, which charges a 12-volt battery used to power a suction pump that collects used oil and transfers it to a storage tank for further processing. Inverters are used in oil recycling collector machines to convert DC power to AC power, control the speed and power output of the electric motor, provide protection for electrical components, and improve efficiency. It is crucial to ensure that the structure of the oil collector machine is strong, stable, and durable enough to withstand the stress and strain of its operations. Therefore, the structure is analysed using ANSYS software to identify potential weaknesses or failures and make design improvements to increase its strength, stiffness, and resistance to external forces. By analysing the structure, the safety and longevity of the oil collector machine can be ensured, and the risk of malfunctions or accidents can be minimized. Overall, the use of an oil collector machine is an essential and effective solution for managing used oil and reducing its impact on the environment.

Keywords: Used oil recycling; Oil collector machine; Environmental impact; ANSYS Software analysis; Sustainable energy

I-CReST 2023:107-066 - An Educational Game Prototype to Cultivate Good Digital Habits

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ABSTRACT

Digital devices are essential in youth's everyday lives and significantly impact their well-being. Indirect effects of continuous usage of digital devices could include stress, digital eye strain, sleep disturbance, and poor academic achievement. It may also lead to an addiction to screen time. Digital habits are healthy or unhealthy habits or behaviours related to digital technology, including digital devices and media. Even though there are several digital tools to monitor digital device usage, there is a lack of games focusing on educating good digital habits. Thus, this study develops an educational game prototype for awareness of good digital habits. A Rapid Application Development (RAD) approach is being used for this study, and it consists of four stages: requirement planning, user design, construction, and cutover. The study's outcome shows that this prototype is promising in cultivating awareness of good digital habits among youth.

Keywords: Digital technology; Digital habits; Educational game

I-CReST 2023:108-069 - Spatial Analysis of Identifying the Association between Risk Factors and Tuberculosis Cases: A Review

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ABSTRACT

Tuberculosis (TB) transmission frequently occurs within a household or group of population, resulting in a variety of spatial patterns. However, apparent spatial clustering of TB may represent ongoing transmission or co-location of associated risk factors and can vary significantly based on the type of data available, analysis methods used, and the dynamics of the underlying population. This study aims to review spatial analysis used for monitoring the trend and association between risk factors and TB cases by applying the concept of spatial epidemiology. The role Geographic Information System in spatial epidemiology were being discussed. The previous studies on spatial analysis of TB cases which includes kriging, spatial autocorrelation, kernel density estimation, hotspot analysis, and regression analysis were being reviewed. The type of analysis was chosen based on the purpose of each study, which could explain the role of transmission to reactivation of the disease as a driver of TB spatial distribution. In diverse situations, a number of different of spatial analysis techniques were used, with all studies showing significant heterogeneity in spatial distribution of TB. Future research is needed to determine the best method for different situations and, where possible, should consider for unreported cases when using notification data. Combination between genotypic, molecular, and geospatial approach with epidemiologically related cases could improve TB control and provide significant contribution of the current knowledge.

Keywords: Risk factor; Trend; Spatial; Tuberculosis

I-CReST 2023:112-168 - Application of Evidential Reasoning Approach in Measuring Performance of Academic Achievements

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ABSTRACT

Occurrence of uncertainties in multi criteria decision making leads to the belief structure framework. In this paper, we will create a composite index using evidential reasoning in measuring performance of academic achievements in schools. Evidential reasoning will be used to get aggregates for each criteria, building the composite index with the help of utility functions. We will compare the results using the crisp utility and also the fuzzy utility. The results were the same for both utilities. This paper shows that the evidential reasoning method is adaptable up to three hierarchies as in the academic performance data and hence shows the flexibility of the method.

Keywords: Composite index; Belief structure; Evidential reasoning; Multi criteria decision making

I-CReST 2023:114-080 - The Relationship between Family Socioeconomic Status and Students' E-Learning Experiences

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ABSTRACT

The COVID-19 pandemic has had a significant impact on learning processes worldwide. It has been determined that the family's socioeconomic status (SES) is an important factor affecting the learning processes at this time. Students from higher-SES backgrounds usually have more access to educational resources and opportunities. Students from lower-SES families, on the other hand, are more likely to face problems that can get in the way of their learning. This study examines the effect of parents' educational background on the mathematical achievement of students, the relationship between parents' financial status and students' e-learning experiences, and the influence of parents' financial status on a student's mathematics achievement. For this quantitative study, 100 Form 4 students from SMK Dato Onn were randomly selected to answer 15 survey questions. To achieve the objectives of this study, descriptive and inferential analyses were carried out using the statistical software SPSS. The result showed that uneducated parents have a significant impact on their children's education, particularly in mathematics. The relationship between parents' financial status and students' e-learning experiences is shown to be significant. In addition, there is no influence of parents' financial status on student achievement in mathematics. Students' academic achievement in mathematics may be influenced by their parent's financial status, but this is not the only factor. Many factors beyond financial resources can impact student achievement, including school quality, teacher experience, and individual student characteristics.

Keywords: Socioeconomic status; E-Learning experiences; Mathematics achievement

I-CReST 2023:126-098 - Customers' Choice Towards Aftersales Application of Counterfeit Spare Parts (Case study of Perusahaan Otomobil National Berhad, PROTON)

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ABSTRACT

Spare parts price of Perusahaan Otomobil Nasional Sdn Bhd (PROTON) is perceived to be expensive by customers and not competitive compared to non-certified service centers. Thus, PROTON customers support and risk the use of counterfeit parts for their vehicles on their daily used. The study evaluated customers' perception levels and the correlations of Customer Choice Characteristics (CCC) with Country of Origin (COO) image towards countries that produce counterfeit spare parts from China, Taiwan, and Thailand. This paper adopts a phenomenological perspective measures customer perceive value of choice towards country of origin were selected and a survey was undertaken among 201 PROTON customers. The findings of the study revealed that PROTON customers accepting of Taiwan's counterfeit automotive spare parts which satisfied overall customer perception category both CCC and COO compare to China and Thailand. Findings also suggested Taiwan's evaluation of mean value of component customer perception is the highest ranging between 4.446 to 4.922. While Thailand and China average mean value ranging between 3.569 to 4.027 and 2.111 to 3.862 respectively. The results support by the correlation evaluation based on Pearson's Coefficient that Taiwan's having moderate positive correlation coefficient (ρ) between $r = +0.5$ to $+0.7$ of all 6 variable components of both CCC and COO namely willingness to buy, attitude towards products, product evaluation, country belief, people affect, and desired interaction. While correlation for both China and Thailand have a weak relationship between CCC and COO of $r < 0.5$ of all variable components. All components of CCC have a positive relationship with the COO with all variables moving in the same direction for all three countries. Respondent's level of agreement and satisfaction well accepted towards Taiwan's quality counterfeit products with high positive perceptions. This customer acceptance allows spare parts Taiwan's manufacturer considering investing in Malaysia market.

Keywords: Country of origin; Customer choice characteristics; Counterfeit; Data analytic; Spare parts

LEVERAGING TECHNOLOGICAL ADVANCES AND MULTIDISCIPLINARY RESEARCH FOR A SUSTAINABLE FUTURE IN EDUCATION
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I-CReST 2023:127-141 - Improvement Designs of Jigs and Fixtures for Improve Working Postures and Eliminate Repetitive Movements

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ABSTRACT

The layout design is crucial in maximizing productivity and enhancing safety during production operations. It eliminates waste in production, such as movement, time, and space in the production area. This study conducted improvements at a television manufacturing company. The first step was to observe the current production method, followed by listing possible improvements. Finally, proposed designs for jigs and fixtures were suggested to improve operations at the company. Three improvements were suggested: proposing a design for round-shaped component storage, improving the part rack for the production line, and improving the jig for the source board grounding process at the assembly area. These improvements will enable employees to pick up parts in a more comfortable position, reduce the risk of musculoskeletal disorders (MSDs), improve working posture, and eliminate repetitive movements that can lead to injury and affect the body movement of the production worker. At the same time, the design of the jigs will help implement lean manufacturing, which will eliminate waste in the manufacturing operation.

Keywords: Ergonomics risk factors; Continuous improvement; Safety and Health, Jigs and Fixtures

I-CReST 2023:128-099 - Process Simulator for Manual Handling Pesticide Packaging Assembly Line

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ABSTRACT

Reducing production costs without sacrificing product quality is essential for the global market survival. The problem of line balancing, especially assembly line balancing, plays an important role for industry in achieving the highest quality and lowest cost. This project presents the simulation of line balancing the pesticide packaging assembly line in pesticide-based company. This study aims to develop a productive and effective way of assembling the product to meet customer demands. Line balancing is about arranging a production line so that the production flow from one workstation to the next is even. Line balancing also provides a successful tool to reduce bottleneck by balancing the task time of each workstation so that no delays occur, and nobody is overburdened with their work. The whole project contains study of line balancing through theoretical calculation and analysis done in the simulation model. The simulation was performed using the Proses Simulator. Proses simulator has been used to simulate the layout condition based in precedence diagram. The first step in using Proses Simulator is to create a simulation model of your process in the Visio layout. This accomplished by adding activities, entities, and resources to the Visio layout and then connecting them with arrival and routing connections. Overall simulation result shows that total unit produce for 5 weeks is 11,240 cartons with average time in system 11,293.85 minutes and average time in operation is 2.39 mins. Filling process and labelling process shows highest operation percentage. Blocked percentage increase at before process of bottleneck process. The assembly line plays a critical role in enabling the factory to deliver the right quantity and quality on time.

Keywords: Process simulator; Line balancing; Costing; Assembly line

I-CReST 2023:129-088 - Development of Solar System Courseware for Dyslexia Children using Persuasive Technology Theory

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ABSTRACT

The development of Solar System Courseware for Dyslexia Children also known as SSCDC is to assist children with reading disabilities also known as dyslexia especially, children who have phonological dyslexia to learn how to read and write the names of stars and planets in our solar system. In this proposed courseware, three objectives have been identified that is to identify the current phonological characteristics of courseware for children with dyslexia, to design and develop the courseware for children with dyslexia to learn about the solar system, and lastly to evaluate the functionality of the proposed courseware. The theory used to develop this courseware applies the Fogg Behaviour model (FBM) persuasive technology to encourage the children to act based on targeted behaviour, hoping to attract their attention during the learning session and allowing teachers to make the courseware as one of their teaching materials. To develop this courseware, the Addie model, a methodology, has been chosen to assist this project in reaching the objectives successfully. To determine the courseware efficiency and effectiveness, functionality testing and usability testing using test cases have been made to ensure the purposes of the project are achieved. The developer also acts as a tester that fills in the test case form for the courseware's multimedia elements such as graphics, audio, video, text, animation, and the flow of the courseware follow the expected outcome to ensure the content of multimedia is delivered. This courseware may help children with phonological dyslexia to learn to read and write better and spark their interest in learning about our solar system.

Keywords: Courseware; Dyslexia; Persuasive technology; Fogg behavior model

I-CReST 2023:138-100 - Enhancing Chronic Disease Diagnosis Using Multilevel Machine Learning and Deep Learning Techniques: A Long Short Memory (LSTM) and Random Forest-based Approach

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ABSTRACT

Chronic diseases, including chronic kidney disease, pose significant health risks and are challenging to diagnose and cure. Early detection is crucial in preventing costly treatments in the later stages of disease progression. However, manual detection and diagnostic methods are often complex and can result in inaccurate predictions that negatively impact patients. Therefore, the healthcare industry has introduced machine and deep learning models to automate disease detection, reduce the workload of medical professionals, and optimize healthcare systems. The goal of this research is to enhance the accuracy of automated diagnosis, specifically for chronic diseases that share common risk factors and conditions. Inaccurate diagnoses can lead to inappropriate treatments, which can be fatal or result in extended hospitalization, thereby increasing healthcare costs. Due to the complexity of the datasets, a multilevel model using machine learning and deep learning techniques is required to identify the type of disease and its risk level, support medical decision-making systems, and improve overall patient health by facilitating timely prediction and classification to diagnose chronic diseases. This research proposes a prediction model that integrates Long Short Memory (LSTM) and Random Forest algorithms for quick disease identification, addressing data pre-processing limitations and research gaps concerning the fine-tuning of LSTM. By accurately detecting and diagnosing chronic diseases, this research aims to minimize the risk of chronic diseases and ensure patients receive timely and appropriate treatment.

Keywords: Deep learning; Medical Decision-Making; Long Short Memory (LSTM); Random Forest Algorithms

I-CReST 2023:138-101 - Deep Learning Techniques, Gated Recurrent Unit (GRU), Long Short Memory (LSTM), Energy Prediction

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ABSTRACT

Energy production companies and scientists have been challenged for decades to predict how much energy is consumed by buildings. The traditional models have focused on the overall energy consumption prediction. The customer-based data has not been considered previously. Numerous studies have focused on predicting the energy consumption of residential and commercial buildings. While monthly electricity consumption is commonly modeled for residential buildings, commercial buildings are typically modeled on an hourly basis. Prior research has primarily reviewed and validated completed methods for residential buildings based on monthly energy consumption statistics. However, it is crucial to explore alternative datasets and methods to identify the most effective deep learning techniques for modeling residential electricity consumption accurately. In light of this, the proposed GRU model addresses future energy demand by predicting customer energy consumption in daily, weekly, and monthly scenarios. The model's performance surpasses that of the LSTM, with lower RMSE and sMAPE values in predicting the energy consumption of five customers. Future research will expand the scope of work to include more customers and validate the GRU model's performance.

Keywords: Deep Learning Techniques; Gated Recurrent Unit (GRU); Long Short Memory (LSTM); Energy Prediction

I-CReST 2023: 145-107 - The Discolouring Efficiency on Different type of Activated Carbon

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ABSTRACT

The decolouring process with Ion Exchange Resin (IER) column uses as much as 2000L of resin which subsequently increases production costs. The beads are typically porous, providing large surface area on and inside them where the trapping of ions occurs along with the accompanying release of other ions, and thus the process is called ion exchange. The aim of this project is to study the effectiveness of different type of Activated Carbon use in an attempt to relate decolorization performances to surface areas, pore volumes, bulk densities, ash contents of the carbons in powdered and liquid form, pH and electrical conductivities of their suspensions, and their colour adsorption properties from iodine and molasses solution were all measured in an effort to relate decolorizing performances to other characteristics. Activated Carbon treatment is a very delicate unit process which needs proper equipment and precision process control. The chemical process developed was tested at lab scale and in a pilot plant. The colour removal capabilities of all carbons were measured at 1/100 dosage, and isotherms were deter-mined on better samples. The effects of the Activated Carbon dosage, time and temperature on the decolouring efficiency (DE %) were studied. The different type of activated carbons showed different decolorization efficiencies; which could be related to their physical and chemical properties. The study outcomes are to give suggestion on type of Activated carbon as an aid to decolorization process which can be helpful to bring down the cost of production apart from an attractive economic factor. Activated carbons made-up from agricultural and industrial waste are new adsorbents, which seem very promising for water and air treatment subsequently with lower cost of production.

Keywords: Ion exchange resin; Activated carbon; Decolouring; Efficiency

I-CReST 2023:151-116 - Mixed Convection Flow of Ternary Hybrid Nanofluid Past a Stretching Sheet with Convective Boundary Condition

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ABSTRACT

Ternary nanofluids have attracted enormous attention among thermal scientists and engineers and are widely used as coolants in automotive, renewable energies, electronic cooling, refrigeration, thermal storage, due to its significant impact in heat conductivity. Thus, mixed convection flow of ternary hybrid nanofluid past a stretching sheet with convective boundary condition is investigated. The ternary hybrid nanofluid is formed by dispersing three different nanoparticles, namely titanium oxide, silicon dioxide and aluminium oxide in water as chosen base fluid. Similarity transformations is used to reduce the partial differential equation to ordinary differential equations, and then solved numerically by using bvp4c solver. Graphical representations and discussions for the velocity and temperature profiles across different relevant parameters i.e., Biot numbers and mixed convection parameters are provided. The comparison among single nanofluid, hybrid nanofluid and ternary nanofluid are presented for pertinent parameters. The results indicate that the ternary nanofluid has superior thermal conductivity compared to the hybrid nanofluid.

Keywords: Steady flow; Ternary nanofluid; Mixed convection; Numerical solution

I-CReST 2023:156-120 - Design and Fabrication of IoT Smart Farm

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ABSTRACT

This project will help farmers to be connected with the farm at any place. It can help to observe the temperature, humidity and potential of hydrogen (pH) of the land. Most farmers will have a problem to keep watch on the farm when traveling far away for work. This is supported with the constant hot weather in Malaysia. So, this project is aiming to help farmers to keep the farm in check at any place and time. The project will be using a few sensors such as temperature sensor, pH sensor and soil humidity sensor to get the information needed and it will send the information to the phone of the farmers through Arduino Internet of Things (IoT) Cloud. When the information has been received, farmers can activate the water sprinkler system with just a press of a button from the phone to water the plants. This will ensure that the plants can grow healthy. The project will be using a close loop system because it can reduce a system sensitivity to external disturbance. The hope for this project is that it will help farmer to be more efficient in keeping the farm in check and also increase the quality of the product produce.

Keywords: Smart farm; Temperature; Soil humidity; Arduino Internet of Things (IoT)

I-CReST 2023:159-123 - Design of Flexible and Adjustable Worktable

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ABSTRACT

Health issues related to bad postures at workplaces have been a problem for quite some time. Despite efforts to address this issue, it remains a challenge to completely eradicate the problem. The standard worktable has a fixed height. Often the height of the worktable is not optimal for achieving a healthy posture, which is unfavourable for the human body's posture assuming that the typical chair used is also fixed in height. This paper covers the design and development of a worktable that can be adjusted in height and utilised by multiple individuals of different height concurrently. The goal of the design is to encourage excellent postures while sitting as well as standing. Detail anthropometric reviews, including public surveys, were used to establish the design process. The House of Quality, morphological diagram, and Pugh matrix were used in the design selection method. To understand the structural behaviour of the chosen material for the design, the finite element analysis was also conducted. Future studies may be improved by enhancing the aesthetics of the worktable.

Keywords: Occupational health; Adjustable worktable; Anthropometric measurement

I-CReST 2023:162-234 - Linear Codes Associated to the Jacobian Factors of Irreducible Curve Singularities

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ABSTRACT

The linear (error-correcting) codes associated to higher dimensional projective varieties defined over a finite field have been studied intensively over the past three decades. In the present paper, we introduce a new linear error-correcting code associated to the Jacobian factor of an irreducible curve singularity, which is referred to as the Jacobian factor code (or JF code, for short). As a projective system, we define Jacobian factor codes for given irreducible curve singularities and study their properties. We also consider some examples and calculate their fundamental parameters.

Keywords: Linear code; Jacobian Factor; Irreducible Curve Singularities

I-CReST 2023:166-130 - Diagonally Implicit Class of Block Backward Differentiation Formula with Off-Step Points for Stiff ODEs

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ABSTRACT

In this paper, a diagonally implicit class of Block Backward Differentiation Formula (BBDF) with two off-step points was formulated for the solution of first order stiff ordinary differential equations (ODEs). The order and stability properties in terms of zero stability and convergence of the method are discussed. The stability analysis shows that the developed method is zero and A–stable. The numerical results indicate that the proposed method has improved in terms of its accuracy compared to the existing methods of a similar form in the literature.

Keywords: Block Backward Differentiation Formula; Diagonally Implicit; Stiff ODEs; Stability Analysis; Off-Step Point

LEVERAGING TECHNOLOGICAL ADVANCES AND MULTIDISCIPLINARY RESEARCH FOR A SUSTAINABLE FUTURE IN EDUCATION
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I-CReST 2023:168-178 - Multiple Regression of Mathematics Achievement Based on Mathematics Anxiety, Student Attitudes, and Home Educational Resources

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ABSTRACT

Mathematics anxiety, students' attitudes, and home educational resources are among the factors that are often associated with students' achievement. There are still few studies examining the relationship of these three variables to students' achievement. Therefore, this study was conducted to examine the relationship between mathematics anxiety, students' attitudes, and home educational resources on mathematics achievement among primary students. The Modified Abbreviated Math Anxiety Scale (mAMAS) and Short Version of Attitudes toward Mathematics Inventory (Short ATMI) and home educational resources (HER) from TIMSS questionnaire were used in this study. The questionnaires were adapted using forward-back translation and two experts were invited to validate the translated questionnaires. A total of 214 year 5 students from three rural schools in Semporna Sabah became the respondents in this study. The results from the study showed the reliability of the questionnaire is acceptable. Cronbach alpha value of mAMAS is 0.882, Short ATMI (0.922) and HER (0.639). The data with no violation assumption then were analysed with multiple regression. The R^2 for mathematics anxiety, student attitudes, and home educational resources towards mathematics achievement was found to be 0.226 using ordinary least square as a parameter estimator. Mathematics anxiety, student attitudes, and home educational resources explain 22.6% of the variation in mathematics achievement. The results of the multiple regression analysis were found to be significant ($F=20.483$, $df=3$, $p<0.001$). The achievement in mathematics is only significantly explained by two of the three independent variables ($p<0.05$). More specifically, home educational resources ($\beta=0.303$) and mathematics anxiety ($\beta=-0.188$). While student attitudes variable is not significant in explaining Mathematics achievement ($p=0.054$).

Keywords: Multiple regression; Mathematics achievement; Mathematics anxiety; Student attitudes; Home educational resources

I-CReST 2023:171-136 - Edge Detection of Kaffir Lime Leaf Using Wavelet Transform Modulus Maxima

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ABSTRACT

Edge detection in image processing widely used in many fields such as engineering and medical with various algorithm such as canny, Wavelet Transform Modulus Maxima (WTMM), Robert and Sobel operator. WTMM algorithm in detect edge had advantage to identify local regularity of function since irregularity structure had functional as to carry all important information in signal, however it unable to extract the full information of edges and cause edges breakage. Hence, this study had purposed kaffir lime leaf to detect edge with improvement WTMM using selected the double thresholds. The goal of applying WTMM algorithm edge detection to refine the edge connectivity and collect fully information to obtained detailed edges. The result showed improvement WTMM successful to detect edge with obtained detailed information and better continuity edge. Furthermore, improvement WTMM algorithm had able to extract the information in blurring image, however it showed the time execution in processing the image to detect edge was take longer time by using MATLAB tool. In addition, the longer time required in edge detection because to collect information and also detailed in filtering the edge to remove false edge. Therefore, this study accomplished to obtain the better edge continuity with clear outline by the improvement WTMM in edge detection.

Keyword: Kaffir Lime Leaf; Wavelet Transform Modulus Maxima; Edge Detection; Image Processing; Thresholding

I-CReST 2023:173-137 - Consumption of Water from Ex-Mining Lake as An Alternative for Water Shortage – A Case Study

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ABSTRACT

Water scarcity is considered a long-term crisis that disrupts water resource availability, one of the concerning environmental problems. This obstruction of water shortage has become the world's major issue which affected 7.7 billion people and is further estimated to reach between 9.4 to 10.2 billion population in 2050. Thus, this scenario has become more critical in many parts of countries throughout the world, which decreased the standard of living and affected the daily activities of the population. Therefore, in line with Sustainable Development Goals, clean water and sanitation have been a key priority to be considered. Water bodies such as the surface water of ex-mining lakes can be an alternative for water intake to meet the demand for drinking water supply. Therefore, this paper aimed to assess the water quality of ex-mining lakes situated in Bandar Saujana Putra, Malaysia, in providing water intake for drinking water purposes. Based on the analysis of the results, the water sample falls into Class II, which is clean, following the Water Quality Index (WQI) from the Department of Environment, Malaysia. However, for heavy metal determination such as Cadmium (Cd), Plumbum (Pb), Arsenic (As), Cuprum (Cu), Ferum (Fe), Manganese (Mn), and Zinc (Zn), the result indicated the water body is unsuitable for drinking water intake as further treatment is required. After implementing the activated carbon filtration method, the water sample showed a significant reduction of the heavy metal concentration and, therefore, can be considered an alternative for water reserve.

Keywords: Drinking water standard; Water quality index; Water scarcity; Water treatment

I-CReST 2023:176-138 - Tempero: A Study of the Optimum Design as Mobile Storage Container for Medical Use

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ABSTRACT

Temperature stability plays an important role in cold chain system involving transporting, distributing, receiving, and storing cold network products. In medicine, transferring medicines, vaccines, chemical reagents, blood products, tissue and organ samples at an appropriate temperature from a place to another is crucial to maintain the viability, and quality of the products. To date, health care practitioners as well as all medical laboratory staff have difficulty to ensure the stable desired temperature is set and maintained during transfer of clinical samples, blood product, cells and tissue samples, and chemical reagents which are temperature sensitive from one premise to another. The current method that is commonly practiced is by storing them in an insulation box filled with ice packs and supplemented with digital thermometer. However, this method is unable to maintain the desired temperature for a long time as ice packs tend to melt and temperature variations are more likely to occur. Hence, temperature inconsistency could jeopardise the samples and chemical reagents' quality. This project aimed to evaluate the optimum design of cooling module and assessed the performance of temperature stability using heat transfer concept. In this project, a cooling system using Peltier as a cooling agent was developed and real-time continuous temperature monitoring for handler was incorporated, hence, provide immediate notification to the handler in the event of significant temperature instability.

Keywords: Temperature; Mobile storage; Peltier; Monitoring; Cooling module

I-CReST 2023:177-185 - Enhancing Functionality and Performance of the E-Convocation System

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Abstract

In today's world, every organization requires a management information system to ensure the provision of reliable, accurate, understandable, and easily accessible information whenever needed. At Politeknik Sultan Mizan Zainal Abidin, the E-Convo PSMZA web-based system is utilized to deliver important information regarding the PSMZA convocation to the graduates. The objective of the proposed studies was to determine the specific requirements of E-Convo PSMZA, develop it as a web-based platform, and conduct comprehensive testing on the E-Convo system. This system enables graduates to confirm their attendance for the convocation, reserve graduation robes, and request online certificate delivery. Moreover, the application can be accessed conveniently at any time and from any location. It facilitates the convocation management team in monitoring statistics such as the number of expected attendees, robe reservations, and graduate payments. The system is developed using PHP language, Visual Studio Code, the Apache server, and a MySQL database. The chosen methodology for development is Agile Methodology, which consists of a four-phase cycle designed to optimize time and cost efficiency. White box testing and User Acceptance Testing (UAT) have been successfully conducted on the system, resulting in positive outcomes that align with the expected performance based on input provided. By implementing this system, the workload of the various parties involved in convocation management is significantly reduced, leading to smooth and efficient execution of the convocation event each year.

Keywords: Management Information System; Web-Based; E-Convo

I-CReST 2023:177-142 - Improve Working Posture Using RULA Method to Reduce Risk of MSDs Among Production Workers

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ABSTRACT

Working postures, material handling, and repetitive movements are aspects of ergonomics that pose a danger to the health of workers and need to be improved. Poor working postures can lead to musculoskeletal disorders (MSDs), and these injuries can affect the worker's body movements. This work focuses on improving working postures using the RULA method on the Television Production line. The work involves analyzing working postures and proposing improvements to reduce the risk of MSDs in the workplace. To achieve the project's objective, information was gathered through observation of television production activities, including assembling parts for the TV back panel, carrying loads, inserting television accessories, and manually masking tape at the inspection area. The data obtained were recorded using the RULA employee assessment worksheet. The RULA scores from the observations were between 5-7, indicating a medium to high risk level. The proposed improvements include providing a stage platform for assembly activities, providing a stair-climbing trolley for carrying loads, providing back support belts for lifting, and installing a one-hand packaging tape dispenser. It is expected that the risk of MSDs among workers at the television production line will be reduced after implementing those countermeasures.

Keywords: Ergonomics Risk Factors; RULA; Safety and Health; Production

I-CReST 2023:184-143 - Assessment of Noise Level at Assembly Production Line Using Digital Sound Level Meter Smartphone Application

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ABSTRACT

Noise is one of the issues that could impact the hearing of workers in industries. It is the employer's responsibility to ensure that the noise level is within the limit allowed by the authorities. This paper presents an assessment of the noise generated from television assembly operations. A digital sound level meter smartphone application was used to determine the noise level. The data were compared to the noise exposure limit from The Factories and Machinery (Noise Exposure) Regulations 1989, which states that no employee shall be subjected to sound levels greater than 90 dB (A) or greater than 115 dB (A) at any time. The noise levels were demonstrated visually through noise mapping in relation to the highest and minimum sound levels. The noise tests were performed in three areas: assembly, inspection, and packing. The results show that the noise level is within the DOSH exposure time standard of 90 dB for eight hours a day, therefore the workers are not exposed to excessive noise on the production line.

Keywords: Ergonomics Risk Factors; Continuous Improvement; Safety and Health; Noise Level

I-CReST 2023:194-153 - Success Factors of Business Intelligence Implementation in Higher Education: A Pilot Study

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ABSTRACT

Business Intelligence System (BIS) is an integrated set of tools where technologies and programming are used to acquire the data, merge, analyse, and make the data available as information for the organisation to achieve the desired outcome. BIS is a rapidly expanding area of technology, and many organisations now use BIS in their decision-making processes in order to make better decisions and enhance their organisations' performance. By making data easy to access and share, BIS platform makes it possible for management to make better decisions quickly, which has a direct effect on the success of organisations' strategic planning and growth. As a result of the development of technology, there are numerous organisations, including universities, that are comprised of a large number of individuals including students and alumni data and contain numerous data-rich systems. Without technology, it will be challenging for the organisation to manage and track a large amount of data with multiple systems. This study seeks to answer the question, "What factors can make the implementation of business intelligence in higher education successful?" Prior theoretical works from previous studies are discussed, and certain criteria-selection based factors have been identified. Subsequently, this study presented a pilot analysis on 30 samples of lecturers and graduated students from one Malaysian public university's Master of Business Intelligence post graduate programme. The results of pilot studies revealed that System Capability, Data Quality, Change Management, Methodology, Training, Top Management Support, and Team Member Support are reliable factors that can be considered in the next phase of research to determine the success factors of BIS implementation in the higher education setting. This also suggests that nine hypothesized associations between these factors and user satisfaction in BIS can be reliably postulated to determine success BIS implementation at universities.

Keywords: Information System Success; Success Factors; Business Intelligence; Higher Education Setting

I-CReST 2023:197-152 - VIKOR Method with Z-Number Approach for Portfolio Selection Decision

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ABSTRACT

Investors and decision makers (DMs) have become increasingly interested in portfolio selection in a borderless world in recent years. In real-world market situations, the performance of a great number of portfolios is typically unpredictable due to the presence of uncertainty and unreliable factors in numerous criteria. Therefore, it is essential to increase investor returns and promote an investment strategy through thorough evaluation. This occurrence becomes critical if the DMs employ an unsuitable strategy that fails to handle both aspects in a prudent manner. Due to its importance, this paper implements a VIKOR method with a Z-number approach for selecting the optimal portfolio among the identified alternatives. It is believed that the two components *A* and *B* of the Z-number structure, where *A* is a restriction of the evaluated attribute and *B* is a degree of certainty of *A*, deal with uncertainties and reliability issues more effectively. A numerical example from an adopted case study has been provided to demonstrate the effectiveness and viability of the proposed method. The outcome demonstrates that the approach can address the uncertainty of human judgment with greater precision while simultaneously boosting the DMs' confidence throughout the evaluation process. Consequently, the proposed method provides a more dependable and effective method for DMs to make decisions, particularly regarding portfolio selection.

Keywords: Fuzzy VIKOR; Multi-Criteria Decision-Making (MCDM); Portfolio Selection; Z-Number

I-CReST 2023:207-163 - Technology Readiness Level: Advancing Locally Made Unmanned Aerial Vehicles

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ABSTRACT

In today's highly competitive innovation environment, successful product delivery relies on effective technology commercialization. While market acceptance plays a significant role in the commercialization process, achieving the appropriate Technology Readiness Level (TRL) is essential for success. However, there is limited research focused on TRL specifically tailored to locally made UAV research products. Addressing the pressing need to commercialize Malaysian locally made products, this study proposes a comprehensive TRL concept framework specifically designed for the Unmanned Aerial Vehicles (UAV) industry. To develop this framework, the study utilized the Delphi Method, employing a qualitative approach through two rounds of Semi-Structured Interviews (SSI). These interviews involved inventors who are experts in their respective fields, and Expertise Opinion Analysis (EOA) was employed to assess their knowledge regarding the readiness of their products to meet market demands. Additionally, the respondents are captured according to their active participation and have achieved ultimate TRL levels in a UAV product development. The collected data were thoroughly analyzed to establish a comprehensive TRL concept framework specifically tailored for UAVs, considering the variations in TRL across different industry fields, aims to contribute to the advancement of local UAV technology commercialization. By proposing a comprehensive TRL concept framework, this research strives to enhance the efficiency and sustainability of technology commercialization in Malaysia, thereby fostering innovation and driving economic growth within the UAV industry.

Keywords: Technology Readiness Level (TRL); Unmanned Aerial Vehicles (UAV)

I-CReST 2023:209-165 - A Review of Heart Disease Prediction Using Clustering and Classification Techniques

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ABSTRACT

Advancement in technology today has improved the availability and accessibility huge amounts of valuable data and it only makes sense for us to explore the opportunities that lie in the data that could possibly save lives and reduce costs. Data mining is a valuable process in the healthcare sector as hidden patterns, anomalies and correlations can be identified in medical data which could be used for better diagnosis and treatment of patients. Basically, clustering and classification are data mining techniques which is the process of extracting useful information from vast amounts of data. Therefore, the objective of this paper is to review about the existing classification and clustering data mining techniques which has been used to predict heart disease. Studies show that applying classifiers on clustered data can improve the performance of algorithms. Hence, this method was explored in this study using the Naïve Bayes, Decision Tree, Artificial Neural Network classifiers together with both K-Means Clustering and Hierarchical Clustering. The performance of the related work models has been measured and compared against each other using various evaluation metrics namely accuracy, precision, recall, sensitivity, specificity, and model build time. In summary, the comprehensive review from these studies will contribute to identify the best model that can be used for the prediction of heart disease using clustering and classification techniques as a future work.

Keywords: Heart Disease; Clustering and Classification Techniques

I-CReST 2023:209-166 - Proposed Cyber Harassment Model for Social Media Users in Malaysia

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ABSTRACT

Nowadays, technologies are becoming developed, especially smartphone's where we can perform various kinds of activities. These activities include video calls, online bank transactions, surfing online websites and social media. Therefore, social media is becoming more popular as the technology becomes more sophisticated. However, it is making easier for people to be a subject of cyber harassment. Basically, the cyber harassment is defined as an online act that repeatedly and intentionally aims to hurt, inflict pain or cause damage toward the other party using an electronic devices. Thus, the objective of this study is to identify the related factors that lead to cyber harassment on social media based on previous cyber harassment studies or models. The identified factors has been used to develop a proposed model that lead to cyber harassment namely, social media use, internet exposure, perceived behavioral control, awareness of consequences, ascription of responsibility, social influence, cyber engagement, and cyber stalking. The proposed model from this research would benefit individuals and related government agencies in terms of cyber harassment awareness and also mitigating and preventing cyber harassment cases on social media.

Keywords: Cyber harassment; Social media

I-CReST 2023:209-261 - Classification of Fileless Malware Under Advanced Persistent Threat (APT) Attack

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ABSTRACT

Creators of malware and cyber security researchers have been competing with one another to create stealthy malware for malicious purposes on one hand and to create defensive mechanism on the other hand. In our highly connected world, the propagation of malware can be rapid considering the various applications and mobile devices utilized worldwide. The situation is worsened with the advent of cyber attackers that are well funded, equipped with technical knowledge and can operate with a longer time-frame than traditional hit-and-run attackers. To avoid detection, they employ various techniques such as code obfuscation, dynamic code loading, encryption and packing. Such attacks are currently known as Advanced Persistent Threat (APT). Basically, fileless attack fits in more than one of the attack stages of APT and is considered a more subtle form of attack which compound the challenges in detection and forensic investigation activities. No installation of software on the victim's host is necessary as it exists in a computer's Random Access Memory (RAM) and uses common system tools to execute an attack by injecting malicious code in normally safe and trusted process such as javaw.exe or iexplorer.exe. Thus, the objective of this study is to discuss the classification of fileless malware APT attacks such as memory resident malware, windows registry malware, dual use tool, reflective DLL (Dynamic-link library), process hollowing, and rootkit malware in detail.

Keywords: Malware; Advanced Persistent Threat (APT); Fileless Malware

I-CReST 2023:210-222 - MobiTest – A Software for Mobile-Based Applications Testing

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ABSTRACT

MobiTest is a codeless automation solution that is designed for use with mobile e-commerce applications at the moment. MobiTest's primary mission is to free software quality engineers from the tedium of manually writing test scripts so they can focus on testing apps. Test automation, when carried out effectively, not only delivers ease and quality but also eliminates the need for manual labour, thereby saving time, resources, and money. MobiTest is an application that acts as a helper in the rapidly expanding industry of software testing. In this industry, testers, quality assurance teams, and others are required to test each application step by step without wasting significant time going through the entire cycle again to find bugs. Utilizing this application is a simple chore because of its user-friendly features and informative content. With the support of continuous integration, testers can keep up with the pace of the development cycle and begin automation as soon as the user interface development is finished, saving valuable time in the process. In designing this application, there came to be a requirement for manual testing, which has the problem of consuming more resources than necessary. MobiTest was developed to circumvent these limitations by having the capacity to generate generic test scripts for any application when necessary. It can handle complex tasks dynamically and intelligently based on the parameters that have been established. This application scrutinizes every little conceivable element to provide the hacker with a window of opportunity to break into the system.

Keywords: MobiTest; Codeless; Automation; E-commerce; Leverage; Quality assurance teams; Integration; UI development; Generic; Test scripts; Hacker

I-CReST 2023:211-167 - Numerical Solution of Hyperbolic Goursat Partial Differential Equations with Hybrid Central Difference-Taylor Series Expansion Method

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ABSTRACT

This paper investigates a new method for solving the Goursat partial differential equation (PDE) using a combination of the central finite difference method (FDM) and Taylor series expansion. The study evaluates the effectiveness and accuracy of this new approach, analyzing linear Goursat problems and conducting multiple numerical experiments. The simulation study demonstrates that the suggested approach surpasses the existing method in terms of performance and accuracy. Applying this proposed scheme, will minimalize the cost, especially for engineers that might apply this model in solving their real-life problems.

Keywords: Central Finite Difference Method; Goursat Problem; Hyperbolic Partial Differential Equation; Numerical Differentiation; Taylor Series Expansions

I-CReST 2023:215-173 - Designing and Developing Web Based System for Managing Charity Coupon at Sultan Mizan Zainal Abidin Polytechnic

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ABSTRACT

E-charity wallet is a web-based system used at Sultan Mizan Zainal Abidin Polytechnic. The proposed study is aimed to identify the requirement of an e-charity wallet, develop it on web-based platform and conduct testing on the system. It served to store inventory related to charity coupon such as the volume and the receiver of the charity coupon. Before the system was developed, it was difficult to access the data about the receiver of the coupon. The project used waterfall model during the project development. This project involved three user's scope including student(receiver), admin (Hep officer) and canteen or café. PHP language, visual studio code, the Apache server and MYSQL database are used to develop a web-based system while Bootstrap software is used as a frontend of the web interface. White box testing and User Acceptance testing have been conducted on this system. The result shows that the testing is positive, and it mean the system is performed as expected. To be concluded the system helps a lot to make the charity coupon well organized, ready, and easy to use.

Keywords: Charity; Coupon; Web-Based; Inventory

I-CReST 2023:216-194 - A Relationship Between Learning Styles and Upper Secondary Mathematics Achievement in SMK Bukit Garam II, Kinabatangan

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ABSTRACT

Learning style is a vital element and must take into account to achieve learning and teaching objectives. This information is essential to help students learn more effectively and, in turn, change negative perceptions about Mathematics. Teachers can easily choose the appropriate strategy by knowing students' learning styles. They can be used as one of the potential interventions to improve student achievement in mathematics subjects. This study aims to identify the learning style practiced by students based on Kolb's learning style in mathematics. Instead, the other objective is to identify the relationship between students' learning style and mathematics achievement and compare students' mathematics achievement according to the four Kolb learning styles: Activist, Reflector, Theorist and Pragmatist. The study population is form four students in the SMK Bukit Garam II, Kinabatangan, with an estimated 150 students. Students with weak, moderate, and strong mathematical backgrounds will be involved as a sample study. This study uses a questionnaire consisting of two parts: part A, which focuses on demographic factors, and part B, which measures students' learning styles. The questionnaire adapted from Kolb's Learning Style Inventory (KLSI) will use to measure students' learning styles. The ANOVA tests will use the Statistical package SPSS version 28.0 to analyze the data and compare students' mathematical achievement based on Kolb's learning style. Correlation analysis will measure the relationship between students' learning styles on students' mathematical achievement. Based on previous research data, the expected result is a significant relationship between learning style and student achievement in mathematics subjects.

Keywords: Mathematics achievement; Kolbs' Learning style; ANOVA; Correlation

I-CReST 2023:218-171 - Controlling, Monitoring and Diagnosis Systems to Improve Gas and Energy Production from Biogas Power Plant

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ABSTRACT

With demand for green energy power generation, Biogas Power Plant currently is one of the most popular methods for generating energy from waste. To maximise the power generation, the efficiency while processing the waste is very important. To increase efficiency of gas and energy production from Biogas Power Plant, Supervisory Control and Data Acquisition system installed at biogas plant. All data from process instruments are collected through Data Acquisition System and analysed automatically and displayed on large monitor for supervision. Critical parameter will be added with alarm features to make sure the process value is within the most efficient state. At the end of the process, efficiency parameter will be calculated and analysed and displayed for operator action. All pump and motor are supported to controlled remotely from SCADA workstation, operator does not need to waste time to reach the Motor Control Circuit Panel (MCC) for start and stop the equipment. All the process, calculation and analysis are on real time based so operator can do action immediately. Data processes are recorded on database for future analysis and support for storage data for more than 5 years. Experience shows that improvisation on process can be done easily by referring and analysis the recorded data.

Keywords: Programmable Logic Controller (PLC); SCADA; Efficiency; Automation; Biogas plant

I-CReST 2023:221-201 - myPlanet: The Ultimate Recycling Application

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ABSTRACT

Recycling is the process of collecting waste materials and breaking them down into building blocks that can be turned into new products. Efficient waste management via recycling is essential to protect the environment and the health of human population. However, the community is still unaware of recycling, they have lack confidence and awareness in recycling thus leading to the disposal of recyclable wastes. Therefore, a recycling tracking application called myPLANET was developed to encourage public to recycle their waste thus reducing the waste dumping in oceans and landfills. We also want to develop myPLANET application using Android Studio which consists of Kotlin, XML and Google's Firebase, and guide users on how to recycle using the futuristic features in myPLANET app. Modern problems require modern solutions. Aside from Google's Firebase which will be used for user authentication, data storage, and artificial intelligence, we also used XML, which defines properties and the layout of objects in the app. Moreover, this application utilized APIs (Application Programming Interfaces) that allow applications to communicate with each other, and Kotlin which is the framework, to create the application using Android Studio. As a result, a mapping system was deployed in the application which would guide the users on the location of recycling centers. Besides that, guidelines and FAQ page, a reward system, and recycling programs were also administered to make the objectives of our application came true. Based on the conducted survey, 100% of participants agreed that the app states its purposes and function, and encouraged them to recycle. This app will be a steppingstone of Malaysia's goal in becoming a country with net zero carbon emissions by 2050.

Keywords: myPLANET Application; Recycling process; Tracking system

I-CReST 2023:222-182 - Moneyness Analysis of Hybrid Pricing Formula for Equity Warrants

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ABSTRACT

A financial contract which gives the right, but not the responsibility to purchase or sell securities at a specific price before its expiration is known as warrants. Moneyness is one of the analyses conducted on warrants to discover their individual profitable status. Since the moneyness factor has been evaluated in the literature in a variety of ways, this paper investigates the moneyness of hybrid pricing formula for equity warrants under the Heston-CIR model using several moneyness definitions. The analysis performed on 32 equity warrants in Bursa Malaysia for year 2019 reveals that 93.75% of the warrants using the definition of the stock price divided by the strike price of warrants hold in-the-money status. Similar moneyness status is exhibited by all warrants when moneyness is calculated using the difference between the current stock price and the present value of the warrants' strike price divided by the warrants' present value. These findings verify the in-the-money status obtained from the original moneyness factor calculation using the comparison of the strike price and stock price of warrants, besides supporting the notion that the hybrid pricing formula provides warrant investors with profitable returns.

Keywords: Equity warrants; Moneyness; Stochastic Interest Rates; Stochastic Volatility, Heston-CIR Model

I-CReST 2023:239-216 - Content Based Image Retrieval (CBIR)Using Multispectral Dataset for Mangroves Map Monitoring

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ABSTRACT

This study addresses the limitations of visual recognition in monitoring mangrove ecosystems using RGB composite color combinations for Landsat 8 satellite imagery. The objective of this research is to enhance mangrove monitoring through the utilization of Content-Based Image Retrieval (CBIR) systems and the analysis of multiple RGB Landsat images. By exploring different band combinations, this research aims to improve the accuracy and efficiency of mangrove characterization. The methodology involves applying CBIR techniques to a large remote-sensing image dataset comprising Landsat imagery. The CBIR system extracts meaningful characteristics based on color, texture, and shape information, enabling effective mangrove analysis. The Landsat imagery is selected for its wide coverage, high spatial resolution, and multispectral capabilities, which provide valuable insights into mangrove ecosystem dynamics. The major findings of this research demonstrate the effectiveness of integrating CBIR systems with Landsat imagery in enhancing the visual recognition and characterization of mangroves. Through the analysis of multiple RGB Landsat images, the study reveals a comprehensive understanding of various aspects of mangrove ecosystems, including their spatial distribution, extent, and changes over time. The utilization of CBIR techniques allows for a more accurate and efficient monitoring process, enabling better decision-making for conservation and management purposes. In conclusion, this research highlights the significance of utilizing CBIR systems and Landsat imagery for improved mangrove monitoring. The enhanced visual recognition and characterization of mangrove ecosystems have practical implications for conservation efforts, land-use planning, and sustainable resource management. By leveraging CBIR techniques and the unique capabilities of Landsat imagery, this study contributes to the development of advanced tools and methodologies for efficient mangrove monitoring. Overall, the findings of this research support the sustainable development goal of preserving and sustainably utilizing terrestrial ecosystems, including mangroves. The application of CBIR systems and Landsat imagery offers a promising approach for accurate and comprehensive mangrove monitoring, promoting effective management strategies and contributing to the long-term conservation of these valuable ecosystems.

Keywords: Mangrove monitoring; Landsat imagery; Content-Based Image Retrieval (CBIR)

I-CReST 2023:241-202 - Exploration on the Integration Between Artificial Intelligence (AI) and Crisis Management in Malaysian Companies: A Review

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ABSTRACT

The advance technology and globalization that rapidly occurring across the globe had been a massive support to humankind in many aspects. The surge of Artificial Intelligence (AI) had act as game changer in many industries around the world as artificial intelligence approaches are useful in business, engineering even for medicine field under the scope of information-intensive and knowledge-critical domains. Therefore, with the presence of artificial intelligence in crisis context can help to manage crisis and achieve effectiveness in crisis management aside of being able to response and forecast potential crisis in the future. This is because, based on the current event of pandemic in the past years which shook the entire humanity with sudden plague and disturbed major business especially the corporate world and force major companies to dealt with loss and bankruptcy. This circumstance is not an exception to Malaysia as our countries had to suffer due to the sudden crisis (pandemic) that happened. Hence, this article purpose is to review the literature relating to artificial intelligence under the scope of crisis management in the field of Malaysian companies. In Malaysia, most of the companies with a good execution of crisis management are the Government Link Companies (GLSs) than the private companies and the AI ubiquitous influence can be seen Malaysia through the development and deployment of AI technologies in Malaysia. Thus, this act as an opportunity to studies the adaptation of AI in term of crisis management context in Malaysia companies.

Keywords: Artificial Intelligence (AI); Crisis management; Malaysian companies

I-CReST 2023:242-203 - Bézier Curve Interpolation Model for Complex Data by Using Neutrosophic Approach

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ABSTRACT

The complex data problem with neutrosophic data is difficult to deal with since some data are disregarded due to noise. To address this issue, this work proposes a neutrosophic set strategy for interpolating the Bézier curve. Thus, based on the notion of neutrosophic sets, the Bézier curve interpolation method for neutrosophic data is introduced in this study. The neutrosophic control point is first defined using the neutrosophic set and its properties. The control point is then coupled with the Bernstein basis function, resulting in a neutrosophic Bézier. This curve is then visualised using an interpolation method that comprises curves representing truth membership, indeterminacy membership, and false membership. There is a numerical example and an algorithm for producing the neutrosophic Bézier curve by using interpolation approach at the end of this article.

Keywords: Neutrosophic set; Interpolation approach; Bézier Curve; Complex data

I-CReST 2023:250-220 - The Comparative Study of Fuzzy Logic and Artificial Neural Network Controllers for Dynamic Voltage Restorer for Voltage Sag Mitigation

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ABSTRACT

In this paper, the performances of difference controller of Dynamic Voltage Restorer (DVR) for mitigation technique for voltage sag issues has been discussed. The studies are focusing on the control unit operation and two types of non-linear controllers which are Fuzzy Logic (FL) controller and Artificial Neural Network (ANN). The effect of voltage sag in the system's voltage profile while applying the DVR device is investigated by using MATLAB Simulink application. The analysis has been conducted based on the value of Total Harmonic Distortion (THD) and the length of voltage surges under fault condition. Single Line to Ground (SLG) fault and Double Line to Ground (DLG) fault has been chosen as the voltage sag sources as both faults are the most common sources for voltage sag. Final result indicates that, each controller manage to restore the voltage and has own advantage on mitigating voltage sag.

Keywords: Dynamic Voltage Restorer (DVR); Voltage Sag; Comparative studies; Fuzzy Logic (FL) Controller; Artificial Neural Network (ANN) Controller

I-CReST 2023:253-244 - Bézier Interpolation Modelling for Generating Handwritten Signatures

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ABSTRACT

Handwriting signature is an important biometric attribute in human identification and is used for many authentication purposes such as document authentication, bank check verification, forensic analyses, and others. Generating realistic and genuine handwritten signatures is a challenge in the field of computer graphics and document forgery simulations. In this paper, the modelling of handwritten signatures using Bézier curve interpolation modelling was introduced. Bézier curve interpolation is a versatile yet effective approach for constructing smooth and continuous curves between control points. An algorithm to obtain a smooth handwriting signature by using Bézier interpolation modelling is also presented at the end of this paper.

Keywords: Signature modelling; Bézier Curve; Interpolation; Control points

I-CReST 2023:260-247 - Utilizing ChatGPT for Teaching Computer Networking

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ABSTRACT

ChatGPT has taken the world by storm in recent years with its ability to interact and respond in a 'human way' form. Despite the warm reception, there are also concerns regarding integrity, plagiarism and worry about too much reliance on ChatGPT. Nevertheless, just like with other technologies, resistance is futile, yet its benefit must be embraced while maintaining some guidelines to be adhered. This paper presents the implementation of ChatGPT in teaching and learning theoretical parts of Introduction to Networking course. Though this is a laboratory-embedded course, the cognitive skills part still contributes to 40% of the assessment. It is challenging to maintain engagement and attract the attention of students during lecture sessions compared to laboratory sessions. Therefore, ChatGPT is utilized in various techniques to achieve the mentioned objective.

Keywords: ChatGPT; Education; Teaching; Learning; Networking

I-CReST 2023:263-230 - Modelling for Forecasting Stock Market Using the Discrete Least Square Method and the Lagrange Interpolation Method

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ABSTRACT

Stock market is widely known as a platform to engage in economic transactions of selling and buying stocks or shares that are ownership claims over a business. The least-squares method is a method that involves statistical means by evaluating in-depth regression analysis to estimate the solution of a more determined system while LaGrange interpolation is a statistical method used to estimate an unknown price or potential yield. This paper aims to simple forecast Malaysia stock and apply Lagrange interpolation. To find the accuracy and the efficiency of the method was examine based on root mean square error (RMSE) Weekly stock price monitored for a certain period and analysed using linear, quadratic and cubic least square as well as Lagrange interpolation. The major findings of this paper are that cubic least square is more effective and accurate model since it gives the best forecasting for price and produces the smallest error. Overall least square method could be applied to forecasting stock prices.

Keywords: Least-Square Method, Lagrange Interpolation Method, Stock Market

I-CReST 2023:283-245 - Poisonous Mushroom Detection using Convolutional Neural Network: A Conceptual Paper

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ABSTRACT

Poisonous mushrooms are a crucial area of research due to the high risked they pose to human health. The main challenge in this study is the similarity in appearance between edible and poisonous mushrooms. Mushroom poisoning usually occurs because of misidentifying the species between edible mushrooms and poisonous mushrooms. Misidentification is common due to the general morphology and colour similarity of poisonous mushrooms with edible mushroom species. Wild mushrooms may contain several toxins, such as muscimol and muscarine, which can cause vomiting, diarrhoea, confusion, visual disturbances, salivation, and hallucinations and the symptoms normally occurs between six to 24 hours or more after ingesting mushrooms. In this paper, we attempt to address this misidentifying. We examine the classifying approach in detecting poisonous mushroom by applying convolutional neural network (CNN). This is important for ensuring that mushrooms are safely consumed and not mistaken from harmful species. This paper contributes by providing suggestions for scholars, educators, and practitioners that aid to illustrate how CNN can be instrumental in solving misidentifying problems in support of poisonous mushroom detection system.

Keywords: Poisonous; Mushroom; Convolutional neural network

I-CReST 2023:286-251 - Event Planner Contractor Selection based on Consistent Fuzzy Linguistic Preference Relations Method

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ABSTRACT

Ranking event planners can be subjective as it depends on various factors such as specific event requirements, budget, location, and personal preferences. Therefore, it is a crucial stage in selecting the best event planner since there are many criteria that need to be considered. In this study, we, focus on determining event planner contractors and rank the alternatives by applying Consistent Fuzzy Linguistic Preference Relations (CFLPR). To rank the alternatives, the CFLPR method is applied to reduce the number of comparisons. When the number of hierarchy levels increases, the number of pairwise comparisons increases which leads to the decision-maker judgments will most likely be inconsistent. The CFLPR is chosen due to its ability to minimize the number of pairwise comparisons, reduce the number of questions, and avoid the situation of inconsistency when dealing with larger data. Due to the frequent presence of unclear concepts in data, the precise value is often inadequate for achieving an optimal real-life scenario. Therefore, a hybrid method of fuzzy Decision-Making Trial and Evaluation Laboratory (DEMATEL) and CFLPR is taken to consolidate the event planner contractor selection problem. This study came out with the idea to propose a new hybrid method that involves the combination of two methods which are fuzzy DEMATEL and CFLPR as this combination is not considered yet by another researcher. This method was proposed to improve the consistency of the Fuzzy AHP and to deal with fuzziness judgments. This method constructs fuzzy preference relations matrices by using fuzzy linguistic assessment variables. Therefore, CFLPR is applied in the event planner contractor selection by ranking all the alternatives which helps to choose the best event planner to handle the event smoothly and successfully. This method will reduce the inconsistency and help to select the best event planner that can provide better services.

Keywords: CFLPR; Event planner; Ranking

I-CReST 2023:287-246 - Identifying Contributing Factors towards Teacher's Self-Efficacy and Performance

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Abstract

Self-efficacy and teaching performance play an important role in teacher service. The purpose of this study is to identify the level of self-efficacy and teaching performance among Mathematics teachers in interior areas. Teachers with high self-efficacy are assumed to be more interested and motivated to teach and have career goals for the future. Meanwhile, teachers who have the best work performance can produce quality students. Teaching performance is measured using the Integrated Assessment of Education Service Officers (PBPPP) which is a performance standard instrument that aims to improve the efficiency and commitment of teachers. In order to determine good teaching performance, we need to measure the potential contributing factors which are demographic factors, teaching style and personality. Selected demographic factors such as teaching experience, special allowance for location and level of hardship (ELMLTK), SPM Mathematics grade and teacher dominant option has been selected. A pilot study was conducted with 31 Mathematics teachers who currently teach in rural schools. Findings from the pilot study were analyzed using the Statistical Package for the Social Sciences (SPSS) software version 28.0. A preliminary study was conducted using three existing and standard instruments to measure teacher's self-efficacy, personality and teaching style. The *Teacher's Sense of Efficacy Scale* (TSES) developed by Tschannen Moran and Wolfook Hoy (2001) was used to measure teacher's self-efficacy. Whereas, the *Big Five Inventory* (BFI) and *Grasha-Riechmann Teaching Style* (GRTSI) was used to measure personality and teaching style respectively. The internal reliability of the instruments showed that the *Alpha Cronbach coefficient* obtained from TSES, BFI and GRTSI are 0.898, 0.933 and 0.791 respectively.

Keywords: Self-efficacy, Personality, Teaching style, Internal reliability

I-CReST 2023:313-280 - The Development of PSMZA ICT Maintenance System

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ABSTRACT

The PSMZA ICT Maintenance System of was developed with the aim of helping to solve the management and operational issues faced by the ICT unit at Politeknik Sultan Mizan Zainal Abidin (PSMZA) . This system was developed to assist in efficiently and periodically managing ICT maintenance. The objective of developing this system is to replace the manual system with an online system and to aid the ICT management and PSMZA staff in making maintenance complaints faster and more effectively. By developing this system, all maintenance data and information can be recorded and updated properly. The waterfall model was used as a guide for system development, which included planning, analysis, design, implementation, and maintenance phases. This web-based system, involved three main scopes: Users (lecturers and administration staff) and Staff (technical support and administrators). The development of this system utilized a web-based platform technology. Software and programming languages used for the development of this system are HTML, CSS, JavaScript, bootstrap, PHP, and MYSQL. In conclusion, this system assists PSMZA staff in making direct, fast, and easy ICT maintenance complaints.

Keyword: PSMZA, Waterfall Model, Web-based system

I-CReST 2023:313-281 - Student Final Project Report Management System

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ABSTRACT

Today, Malaysian society is living in an era of globalization that is science and technology-oriented. The use of information technology is essential in delivering information and has become a necessity in efforts to develop and enhance the field of education. In line with this, the Student Final Project Management System was developed to provide facilities for storing records of Student Project Reports and Student Project Reports (Softcopy) for the Department of Information Technology & Communication (JTMK) at Politeknik Sultan Mizan Zainal Abidin (PSMZA). Additionally, this system is used to update and delete Student Project Reports (softcopy) as well as information on Student Final Project Reports, Students, and Staff. The system can be used by students to search for reference sources that can guide them in carrying out their final projects. The Waterfall Model is the methodology used as a guideline in developing this system. The programming languages used are PHP, HTML5, CSS, Javascript, JQuery, and SQL. Furthermore, the Codeigniter and Bootstrap frameworks are also employed in the development of this system. As for the database, the developers chose to use MySQL. Therefore, it is hoped that this system can assist students and staff in obtaining information related to Student Project Reports and ultimately improve the quality of teaching and learning at PSMZA.

Keywords: Student Final Project Report Management System, PSMZA, JTMK

I-CReST 2023:321-289 - Development of IoT Starter Learning Kit for Educational Purpose

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ABSTRACT

The Internet of Things (IoT) is a technology that enables physical devices to interact with their environment over the internet. Considering the present growth of industrial revolution 4.0 and demand of IoT in Technical and Vocational Education and Training (TVET), the usage of IoT devices in educational activities can improve the teaching and learning process to motivate students in much quicker and more efficient methods. There are many kits available in the market, but the cost of the kits is pricey and less ideal for usage to discover the fundamental of IoT. Furthermore, some IoT devices may not be compatible and do not function because of improper installation. Indeed, compatibility issues between IoT devices can present significant challenges during troubleshooting. The purpose of the paper is to demonstrate the development of the IoT starter learning kit which provide users with hands-on experience and practical knowledge in building IoT systems. This kit consists of Printed Circuit Board (PCB) board along with ESP8266, input port for sensor, light emitting diodes (LEDs), organic light-emitting diode (OLED) and relays. The structure of the kit is simple to understand, and it is well constructed. Overall, it can empower both students and lecturers with practical skills, foster creativity and prepare them for the exciting opportunities in the IoT technology.

Keywords: Internet of Things; Teaching and Learning kit; Training kit; Educational kit

I-CReST 2023:322-290 - Analysis of the Difficulty Level of the Electrical Technology Course for Diploma in Electrical Engineering Students in Malaysian Polytechnics

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ABSTRACT

The Electrical Technology course is one of the fundamental courses that must be taken by all students of the Diploma in Electrical Engineering and Diploma in Electronics Engineering at Polytechnics throughout Malaysia. This course is composed of five main topics and related sub-topics. Based on an analysis of student achievements in the Electrical Technology course over the past four semesters, findings indicate that most students achieved grades of B and below. Thus, this study was conducted to determine the difficulty level of each topic covered in the Electrical Technology course. A quantitative approach using a survey method was employed for the design of the study, while an online questionnaire was used as the research instrument. Through random-targeted sampling techniques, the sample of this study involved 52 second-semester students who had completed taking an Electrical Technology course in the previous semester. Data obtained were analyzed using IBM SPSS Statistics version 25, employing frequency and percentage methods. The outcome of this study's analysis revealed that the fifth topic, 'Magnetic Circuits, Electromagnetism, and Electromagnetic Induction,' was perceived as the most difficult topic to understand and master by students. This revenue leads to several suggestions for course teachers to undertake the preparation and give greater emphasis to related topics and sub-themes as the teaching and learning process of the Electrical Technology course takes place.

Keywords: Electrical technology; Difficulty; Student achievements

SOCIAL SCIENCES

I-CReST 2023:009-176 - The Application of Serious Game in Donation Crowdfunding Platform: Mediating Role of User Experience and Trust

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ABSTRACT

The inception of technology in the financial world has spawned many innovative financial activities, including crowdfunding. Ever since its inception, crowdfunding has fostered a thriving environment for fundraising initiatives, facilitating the realization of countless innovative projects and enterprises. Nevertheless, sustaining a consistent stream of donations poses a significant hurdle for crowdfunding platforms. Most crowdfunding platforms lose half of their donors after their first donation. Therefore, this study proposes the use of gamification to increase and maintain individuals' donations on a crowdfunding platform. In addition, this study also examines the role of user experience and trust in platform as a mediating variable between gamification and donor intention on the crowdfunding platform. Data for this research were collected through a survey, then analysed using structural equation model using partial least squares method (SEM-PLS). The hypothesis testing revealed that gamification positively influences user experience, but not donation intention on a crowdfunding platform. Meanwhile, user experience and trust successfully play a mediating role. Thus, the results lead to a discussion on the justification of using gamification and suggestions for future research.

Keywords: Crowdfunding; Donation; Gamification; User experience; SOR theory; Trust in platform

I-CReST 2023:029-017 - Sustainable Green Campus Award: Framework & Assessment

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ABSTRACT

The UiTM2021 Sustainable Green Campus Award acknowledges and promotes residential campuses' solutions to overcome pollution issues and their adverse effects on the economy, environment, social well-being, and community engagement through teaching, research, and cooperative outreach. The following items are introduced as assessment elements: management, water, waste, infrastructure, education, transportation, and energy. Participants need to use the provided form to submit documents and videos. The program's impact is gathering data in the form of documents and videos related to green campus sustainability activities, initiatives, and initiatives that the branch campus has conducted. This data will be used for the university management's final reporting regarding the SDGs agenda that has been achieved. The innovative program is associated with a competition category that was first conceptualized and organized by a local institution in Malaysia, as well as a rubric-based judging procedure developed with Google Forms. Due to the fact that it was successfully implemented as a pilot test at the UiTM level, which had thirty-four campuses, this concept has the potential to be replicated by outside organizations from the institution or industry where the judging technique is unique and has never been applied before.

Keywords: Sustainable green campus; Award; Assessment; Rubrics

I-CReST 2023:031-012 - An Investigation on Creativity of Teachers in Teaching Geometry to Secondary School Students

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ABSTRACT

Creativity is one of the elements that are important for teachers to acquire in order to ensure the effectiveness of teaching process. The purpose of this study is to determine the effective creative teaching approach utilized by a Mathematics teacher in teaching Geometry based on student learning style, which will influence students' understanding. The research sample consists of 5 Mathematics teachers and 100 Form 2 students from School A, Shah Alam. Data is collected through interviews with teachers and survey questionnaires for students. Teachers were selected based on their experience in teaching Geometry while students were selected using the purposive sampling method. For this study, teachers' creativity is assessed using the display method and questioning method. The result from the survey conducted demonstrated that the majority of students were enjoying visual preference learning style. Besides that, students show a positive attitude toward learning Geometry. The result from the study also indicates that students agree that teachers play important role in guiding the students during classroom activity. Hence, it can be concluded that the teaching strategies used by teachers could affect the learning and students' comprehension level. The findings from this study can be used as a guideline for Geometry teachers in obtaining optimum results in the teaching and learning process.

Keywords: Geometry teaching; Secondary school; Teachers creativity; Geometry

I-CReST 2023:031-013 - Assessing the Usage of Mathematical Software as a Tool for Improving Mathematical Skills and Grades among University Students

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ABSTRACT

Nowadays, educational software has evolved and become an important tool in learning. Many universities around the world have optimized and fully utilized the usage of educational software in their education scene. This study will focus on assessing the usage of mathematical software as a tool for improving mathematical skills and grades among students of Bachelor's in Science Education (Hons.), UITM Puncak Alam. This study consists of three research objectives which are to investigate the perceptions towards the usage of mathematical software, challenges faced in the process of using mathematical software for learning, and the effectiveness of mathematical software in improving skills and grades. This study design is based on quantitative method. 100 students were selected as respondents for this study. Descriptive analysis was conducted on all research questions in the data analysis phase. The study result indicated that students have a positive perception towards the usage of mathematical software. The result also shows that students are facing moderate low-level challenges when using mathematical software for learning purposes. Besides that, study results proved that the usage of mathematical software improves mathematical skills and grades indirectly. In conclusion, mathematical software can be used as a tool in teaching and learning for improving mathematical skills and grades. It is hoped that the findings from this study can be used as a benchmark for educators and students in using mathematical software in the teaching and learning process.

Keywords: Mathematical software; University students; Mathematics; Educational software

I-CReST 2023:032-011 - A Correlational Study on Servant Leadership and Employee Engagement in TVET Educational Institutions

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ABSTRACT

This study aims to examine whether there is a significant and positive relationship between servant leadership and employee engagement, especially among educators in TVET educational institutions. The researcher sees the need to carry out this study since educators in Malaysia nowadays are increasingly experiencing burnout, job dissatisfaction, work involvement and turnover intentions. In this regard, the researcher detected the potential of servant leadership as effective leadership and a solution to the bad situation faced by directors in TVET educational institutions. Quantitative, descriptive and Pearson Correlation Coefficient methods were used in this research. Data was collected through a questionnaire using Google Forms from TVET educators in Kuching, Sarawak. Data were analysed using SPSS version 25 to find the relationship between servant leadership and employee engagement. The findings of the study have shown that servant leadership has a positive and significant relationship with employee engagement. Specifically, the analysis showed two of the characteristics of servant leaders, namely, emotional healing and behaving ethically were found to be related to employee engagement. Servant leadership shows its relevance in involving educators in their work. Through this research, educators are looking for caring leaders who act with integrity. The implication of the study is to reveal servant leadership to directors, continuous training, and provide professional development through courses designed to improve the director's skills and knowledge of the theory of the concept of servant leadership.

Keywords: Servant leadership; Employee engagement; TVET educational institutions

I-CReST 2023:043-262 - Light Pollution: A Brief Review on International Legal Framework and Malaysia

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ABSTRACT

This paper reviews issue of light pollution which is a pervasive and prevalent environmental issue with implications for human health, biodiversity, astronomical observations and ecological balance. This doctrinal study consists of comprehensive analysis of background and legal perspectives international legal perspectives from developed countries, including common law cases and international treaties and Malaysia. Given the absence of binding measures in the Malaysian legal framework, this study explores efforts and measures taken by other countries to tackle light pollution. In Malaysia, the Parliament has enacted the Environmental Quality Act 1974 [Act 127]. Nonetheless, the Act lacks a clear and precise definition and enforcement measures specifically addressing light pollution. Hence, this research paper presents a comprehensive analysis of the factors and impacts of light pollution and evaluates the effectiveness and alignment of the Malaysian legal framework with international standards. It identifies regulatory gaps and offers recommendations, emphasising the absence of binding solutions or legislation. Drawing insights from these examples, specific recommendations are proposed for the government of Malaysia to enhance the Malaysian legal framework, reduce light pollution, protect public health and ecosystems and promote sustainable practices. It offers tailored recommendations for Malaysia by empowering policymakers, environmental agencies and stakeholders to mitigate light pollution and preserve natural darkness. Malaysia needs to urgently implement these solutions to have sustainable lighting practices. We need to ensure a harmonious coexistence between human activities and the nocturnal environment for the sake of our future as per United Nations Sustainable Development Goals (SDG), SDG 3 and SDG 15.

Keywords: Light pollution; International law; Malaysian law; Sustainable development goal

I-CReST 2023:048-022 - English Monophthong: Assessing Malay Young Learners' Perception Accuracy

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ABSTRACT

Intelligibility is the ability to differentiate speech sounds, and this ability is essential in communication. Being intelligible is vital as perception accuracy is related to utterance understanding. Communicating in one's native language may not be a problem, but the issue arises when one has to speak in other languages for example, English. To simultaneously listen and understand messages correctly may be challenging. This present study investigates Malay young learners in Malaysia on their ability; in terms of accuracy, to differentiate three English monophthong pairs. Each monophthong pairs consist of one short and long vowel, which are /ɪ/ - /iː/, /ʌ/ - /ɑː/ and /ʊ/ - /uː/. Ten 11-year-old students who studied in a semi-urban primary school in Kuala Lumpur participated in this study. Thus, this study employed the quantitative research approach, the descriptive-comparative design. The participants were selected carefully using a Language Profile Test loosely based on Birdsong et al. (2012). They took part in the two-alternative force-choice (2AFC) test, presented using PsychoPy software. The stimuli were presented in blocks and according to vowel pair, each targeted vowel was repeated three times. The findings reveal that the participants can distinguish the short and long vowels with 73.9% accuracy. Further analysis shows that the participants perceived /ʊ/-/uː/ better (98.3%) compared to /ɪ/-/iː/ (53.3%) and /ʌ/-/ɑː/ (70%). The participants performed better in distinguishing short vowels (75.6% accuracy) compared to long vowels (72.7% accuracy), and no significant difference was found (t (89) = -.555, p = .580). Overall, the participants can perceive and differentiate the targeted English monophthongs, which indicates that they have a high intelligibility score.

Keywords: English in Malaysia; Malay young learners; Perception; English monophthongs; accuracy

I-CReST 2023:062-035 - Evidences of Enhanced Learning and Application of Knowledge through Multidisciplinary Research and Action-Experiential Learning

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ABSTRACT

This paper is positioned at the intersection of three key areas: (1) Multi and Inter-disciplinarian research and pedagogy, (2) their application through Action-Experiential learning pedagogy and (3) selected evidence of enhanced learning and application of knowledge. The paper aims to showcase them positive impacts of Action-Experiential Learning (AxL) designed by inter-disciplinary team of Faculty in a blended comprehensive pedagogy delivered to and for graduate university students and corporate training participants, in addressing pressing issues of sustainability and other business and organizational challenges. Additionally, the paper highlights the evidences shown from a blended pedagogical viewpoint in terms of topic design, content and delivery for a business sustainability training. The impacts looked into by this paper are the outcomes of the pedagogy of action-experiential learning, inter-disciplinary team of Faculty, research focus and research mindset.

Keywords: Action-Experiential learning; Multidisciplinary; Blended pedagogy; Sustainability; Research mindset

I-CReST 2023:065-036 - The Phonological Features of Malaysian English (ME)

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ABSTRACT

The study of Malaysian English (ME) has gained significant attention due to its emergence as a distinct variety of World Englishes. However, while its lexical, syntactical, and phonological features are well recognised, the latter remains understudied. This paper focuses on the phonological features of ME described by previous researchers through comprehensive library research. The findings suggest that the phonological features of ME encompass three main areas: vowels, consonants, and suprasegmentals. However, the existing research has overlooked the influence of the country's diverse ethnicities on the standardisation of ME as a unique World Englishes. Thus, further research is required to address this gap and develop a more inclusive understanding of ME.

Keywords: Malaysian English; Phonological features; World Englishes

I-CReST 2023:071-039 - The Techniques of Neutralization: A Case Study of *Project: High Council*

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ABSTRACT

The Project: High Council is a 10-episode series that was aired on Astro from January to March 2023. This series revolves on an elite boys' boarding school named Kolej Ungku Deramat (KUDRAT) in the year 2007. However, this institute has a 'dark side' where the students were regulated by a student organization named 'high council'. As such, this drama showcases the unpleasant atmosphere due to the organization that acts as a social control. Fights between the Form Four and Form Five batch, bullying, breaking the school rules, violence that lead to injuries and near fatal experiences are some of the highlights. These deviance activities flourished over the years without any students reporting the incidents to the school management. The question here is why are students not willing to bring this matter to the teachers' attention? Are they supporting these deviant actions? Hence, the researchers analyzed this issue by adopting the five techniques of neutralization. Moreover, textual analysis methodology was utilized to examine the 10 episodes of the drama. On that account, the findings enlightened the audience in understanding how this vicious cycle that is camouflaged in the name of high council tradition survived: First, denial of responsibility where students refused to be held responsible for any untoward incidents that occurred due to their tradition. Second, denial of injury where students escaped by proclaiming their fights as a part of their tradition. Third, denial of a victim where the students were willing to victimize other students to become the next leader in their high council. Fourth, condemnation of the condemners where students criticized the significant others such as teachers to conform to their brutal tradition. Fifth, appeal to higher loyalties that caused the students not to oppose their high council's tradition. In conclusion, the Project: High Council was a revelation of how educational management and leadership failed to recognize and acknowledge the deviance activities despite being a crème de la crème academy.

Keywords: Project: High Council; Techniques of Neutralization; Elite boarding school

I-CReST 2023:072-068 - Challenges and Solutions: The Experiences of Out-of-Field Lecturers

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ABSTRACT

Quality and effectiveness of teaching and learning will be achieved through the mastery of lecturers in the field of teaching taught. However, the Out-of-Field (OOF) phenomenon that requires lecturers to teach subjects that are out of their field and expertise has given an impact on the quality of teaching and learning. In fact, there are non-accounting lecturers who need to teach topics related to accounting or finance, particularly in an entrepreneurship subject. This brings challenges to the lecturers involved. Thus, this study attempts to explore the challenges faced by OOF lecturers in the teaching process and how they address these challenges. Hence, this qualitative study gathered data through observation, interview, and content analysis involving seven (7) participants from different academic backgrounds, using both inductive and deductive analytic methods. Subsequently, the study found that OOF lecturers experienced difficulties and challenges during the teaching and learning process. Moreover, the study also found that five (5) major themes emerged as to the lecturers' experiences with OOF teaching: travails, adjustment issues with the subject's academic content, hard-to-answer students' questions, tough in building authority, and challenges in using effective teaching methods. Lack of resources and content knowledge were identified as common challenges faced by OOF lecturers. However, the lecturers employed various coping strategies, such as thoughtful preparation, using different teaching methods, pursuing professional development, peer coaching, and measuring learning outcomes. In addition, the participants suggested several solutions to address the problem of OOF teaching, exclusively developing related educational applications. It is hoped that this study can benefit policymakers, educators, and institutions in developing appropriate policies, strategies, and programs to support OOF lecturers and improve the quality of education in entrepreneurship and related fields. Ultimately, future researchers may also conduct a study about the underlying causes of OOF teaching and the possible solutions to this issue.

Keywords: Challenges; Out-of-Field (OOF) lecturers; Financial topic; Entrepreneurship course; Solutions

I-CReST 2023:073-048 - "Heretofore Wide of the Mark": Transubstantiating from 'Symptomatic Treatments' to Root-Cause Interventions in Remedying Disability-Related Issues

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ABSTRACT

The issues related to disability have been discussed exuberantly as this group, though has a high prevalence in population, has been incessantly marginalized in multidimensional axes within society. With the recent World Health Organization's report stated that an estimation of 1.3 billion people, representing 16 percent of world's population experience a significant disability, the question remains unanswered is on why this group are still being sieved from obtaining their accordance of their rights, be it in socioeconomic resilience, political involvements, psychosocial wellbeing even participative inclusion. The answer could be corroborated from the approaches taken in getting a handle on this, where they are wide of the mark. Rigorous accentuations on symptomatic treatments to disability issues have always become the stumbling block as it normally postulates on fugacious remedies, and it facilitates towards the disillusionment of frameworks and policies being introduced. Therefore, the need to transubstantiate from symptomatic treatment to root cause intervention is considered the alleviative undertaking in dealing with this matter appositely. Thus, this qualitative study will analyze this transubstantiation process by first and foremost discussing the theoretical definition of disability through an epistemological kaleidoscope. Then, the discussion will be maneuvered towards the conceptual framework of symptomatic treatment and root-cause intervention that become the plinth of this study and the discussion will admissibly deliberate on how recalibrating from the former to the latter would provide more remedial understructure. This research will further dissect this notion by putting on prominence onto several key elements that derive from multidimensional echelons towards this shift. These include comprehensive mainstreaming, paradigm shifting acculturation, participative involvement, epistemological sensitization, and collaborative networking. Ultimately, by dissecting this subject in perceptible manner, it could help in providing cognizance from ontological, epistemological, and phenomenological stances to efficaciously and meritoriously deal with disability-related issues concerned in future undertakings.

Keywords: Disability; Symptomatic approaches; Root-cause intervention; Multidisciplinary Model of Disability

I-CReST 2023:074-040 - The Impact of Service Quality on Customer Satisfaction of a Theme Park at Johor Bahru, Malaysia

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ABSTRACT

The purpose of this study is to empirically investigate the impact of service quality and customer satisfaction of a theme park at Johor Bahru, Malaysia. This research selected theme park, Johor as the target theme park and a modified SERVQUAL model tends to be used and analyzed the visitor satisfaction. Customer satisfaction is a function which uses to identify the relationship between the actual service performance and customer inner expectation. Hence, it is vital to analyse how the five dimensions of service quality tend to influence the overall customer satisfaction level in the theme park industry. In Malaysia, the theme park business is gradually expanding, and it is significant for theme park operators to clearly understand which qualities of services enable to stand out among other competitors and increase customer satisfaction. Data for this study were collected from a sample of 382 visitors who had experience visited theme park at Johor. It comprised question about demographic factors and perception of service quality dimensions. The collected data was analysed using descriptive analysis. The findings revealed that four dimensions of service quality which are reliability, tangibility, assurance, and empathy positively influence customer satisfaction whereas, one dimensions of service quality which is responsiveness do not have a significant impact. As a result, it is suggested for theme park at Johor to appropriately apply relevant specific tactics to enhance those components of service quality as well as customer satisfaction.

Keywords: Customer satisfaction; Service quality; Dimensions

I-CReST 2023:074-154 - Investigating the Customer Satisfaction of the Public Bus Service in Johor Bahru, Malaysia

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ABSTRACT

This paper provides a detailed examination of a quality-of-service indicator utilised by the Johor Government to assess the opinions of passengers towards bus transport. The city of Johor Bahru is witnessing a rapid growth in population, resulting in traffic congestion and stress on the city infrastructure. One of the main challenges in the city is to attract more users to the only public bus service available since 1970. This paper investigates the quality of service and passengers' perception regarding many factors including comfort, affordable fares, safety, and punctuality. Data was collected through administered questionnaires to investigate the quality of the existing service and the future of bus service at Larkin central Johor Bahru. To gain further investigation regarding the factors significantly affected the commuters' satisfaction, the data was analysed using computer and presented in table using percentages and descriptive analysis. Finally, the recommendation that aim to maximize the use of bus service as public transportation in the city of Johor Bahru were suggested. The findings help to understand the shortcomings of the existing public bus service and provide the responsible authorities with suggestions that can enhance the quality of service and attract more users to the public bus service.

Keywords: Customer satisfaction; Bus service; Public bus

I-CReST 2023:082-090 - Literature Review of Arabic Vocabulary Learning Through the Canva Application

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ABSTRACT

Arabic is one of the foreign languages that has existed in Malaysia and has developed through the education system at all levels, especially at higher education institutions like UiTM. In fact, learning a language is synonymous with mastering its vocabulary, which is at the core of understanding the language. This is because the vocabulary mastery factor is seen as a strategy to learning the basic language skills of reading, writing, listening, and speaking. Previous studies have shown that the issue of Arabic vocabulary has become a dominant issue that has persisted until now, and it is being tried to be addressed through various strategies. However, it is classical in nature and is seen as less relevant to today's technological sophistication, which increasingly dominates the development of knowledge and education. Therefore, this study aims to review the literature related to Arabic language vocabulary learning that adapts today's technology applications. This study is a qualitative one that applies a content analysis design as the main data collection method. Next, the data was analysed descriptively through three discussion topics. The results of the study show that there are emerging issues and problems that can be linked to learning Arabic vocabulary at UiTM. Therefore, the existence of these problems can help to create new ones.

Keywords: Vocabulary; Arabic language; Application; Canva

I-CReST 2023:084-076 - Application of Project-Based Learning in the Matriculation Engineering Program to Develop Future Ready Graduates

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ABSTRACT

The Mechanical Engineering Program at the Matriculation Engineering College has been using the Project-Based Learning (PBL) methodology in the second term of the academic year since 2011. PBL have been learned continuously and have been subsequently incorporated to the application of the project. Some challenges persist, such as: (i) enhancing peer evaluation; (ii) expanding the project coordination team and (iii) refining tools for data collection and analysis. How ready our future graduates are, depends on how higher educational institutions best prepare them for the challenges of the future workplace and the community at large. This study will assess how effective the PBL implementation for mechanical engineering programme in take risks, think strategically, and acquire other future work-ready skills set. Questionnaire was employed in gathering the data. A total of 52 students of mechanical engineering programme for semester 2 took part in this study during the academic year 2022/2023. The findings of the study will reveal the participants ability to implement PBL The various challenges they encountering will also identified. These included choosing a significant content, time management, monitoring and assessment, and lack of facilities. Finally, based on the results, some suggestions and recommendations that could help lectures and decision makers in implementing PBL were offered.

Keywords: Project based learning; Mechanical Engineering Programme; Matriculation Engineering College

I-CReST 2023:087-147 - Addressing Citizenship Discrimination in Brunei and Kuwait Which Caused by Gender Inequality in Law

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ABSTRACT

Since the 1948 adoption of the Universal Declaration of Human Rights, the right to citizenship has been recognized. Several UN human rights agreements and treaties clearly affirm the rights of children. However, with over 15 million individuals living without a nationality, statelessness has become a serious issue on a worldwide scale. State succession, administrative and technological flaws in the government, and discriminatory laws are only a few things that cause people to become stateless. This discriminatory citizenship statute has been very harmful to women and children in terms of access to education, health benefits, access to property, and home ownership. With limited exceptions, mothers are not allowed to provide citizenship to their children in seven countries. This study focuses on Brunei and Kuwait, two of the seven countries for whom there is enough reliable data. By perpetuating the idea that children's identities are mostly derived from the male line and that women are second-class citizens, citizenship discrimination keeps a sexist and discriminatory framework for women's obligations in the home and society in place. In light of the gender-based discrepancy in citizenship laws, this study assesses the incidence of statelessness as well as other negative repercussions on women and children. For the purposes of visualizing statistical data in Brunei and Kuwait, the United Nations High Commissioner for Refugees (UNHCR) maintains a persons of concern database. Additionally, a qualitative examination of these two countries is conducted using materials from the United Nations, the Institute on Statelessness and Inclusion, a case study, and other scholarly publications. This study will in fact also highlight the existing status of statelessness and other detrimental repercussions. The report also suggests certain changes or improvements that the governments of Kuwait and Brunei should do to alleviate gender imbalance in the legal system and sociocultural ecology.

Keywords: Brunei; Kuwait; Citizenship discrimination; Gender inequality; Women

I-CReST 2023:090-050 - Performance of Family Takaful Operators and Life Insurance Companies: A Comparative Analysis in Malaysia

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ABSTRACT

An important element in the financial services sector such as takaful and insurance industry is performance. It is important indicator to evaluate the effectiveness of the industry, how does the industry counter to the challenges and which companies are going to survive their businesses. The purpose of this study is to analyse the performance of 11 family takaful operators and 13 life insurance companies in Malaysia from 2013 to 2018. There are five operational specific factors (OSF) tested in this study which are size, capital, premium growth, underwriting risk and expense ratio. This study uses panel data analysis to analyse the data obtained from family takaful and insurance companies' financial statements. The findings show the performance of insurance companies is better than family takaful in generating profitability (ROA). The findings also concluded that the profitability was affected by four OSFs which are size, capital, underwriting risk and expense ratio while premium growth was found have no impact to the profitability for both takaful operators and insurance companies. From these results, it is recommended that the both takaful operators and insurance companies should control and manage properly their OSFs in order to increase companies' profitability and stabilize their financial system.

Keywords: Performance; Takaful operators; Insurance companies; Panel data; Operator's specific factor

I-CReST 2023:094-067 - Designing Interactive Documentary on Belawai's Fisheries Community

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ABSTRACT

The main goal of the research is to develop an interactive documentary on fisheries community in Belawai, Sarawak. Since there is a lack of media recognition about Belawai's community, the study seeks to promote Belawai as a unique tourist destination while helping to preserve the fishing culture and natural beauty of the Belawai region in the form of digital media. The research employs Service Design Innovation as its main methodology in brainstorming ideas and production of the interactive documentary. The documentary genre remains one of the most useful tools to explain and reproduce reality. Interactive documentary pushes further since it creates non-linear and heightened playful experience, especially for the younger generation. Our research ends with hopeful notes that through creative presentation of selected places in Belawai, more people will be aware of the place, and in turn boost tourism activity there.

Keywords: Sarawak; Belawai; Interactive documentary; Fisheries; Service design

I-CReST 2023:095-052 - Practicum Teacher English Readiness Based on Common European Framework Reference (CEFR) in ESL Teaching

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ABSTRACT

Before gaining its independence, several English Language policy reforms have been introduced to Malaysia's education system. The main reason for the changes would be the need to master the English Language skill, as they greatly influence how Malaysia education system policies are being implemented. There is a growth of the need to improve in mastering the language, coming from the public and private education sector. Hence, it is necessary to prepare the English teachers to be aligned with the Malaysia Education Blueprint (MEB) 2013 – 2025, which introduced the Common European Framework of Reference (CEFR) for languages as guidance in teaching and learning the English language in schools. It was also reported that during the first Cambridge Placement Test, which was aligned with the CEFR in 2012, 70% of the English teachers failed to reach C1 or C2 level (high mastery). There were a total of 61,000 who sat for the test. Henceforth, this study is conducted to investigate the level of proficiency of the practicum teacher candidates according to the Common European Framework of Reference for Languages (CEFR). Thirty respondents were chosen to sit for Aptis Remote, administered by the British Council. The results from the Aptis test revealed that 30% of the candidates passed the test with grade C1, the minimum level of proficiency set by the Ministry of Education Malaysia (MoE). Future research directions are proposed in consideration of developing an incentive programme for teachers and introducing a reliable testing tool linked to CEFR level to assess and monitor the level of proficiency of practicum teachers.

Keywords: CEFR, Practicum teacher, English readiness, ESL teaching

I-CReST 2023:096-053 - Use of Multimedia in Teaching and Learning Economics: An Expansion of the UTAUT Model

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ABSTRACT

Various information communication and technology (ICT) are used in teaching and learning economics in Malaysia. Using the extended Unified Theory of Acceptance and Use of Technology (UTAUT) model, this paper aims to examine the determinants of the acceptance on the use of multimedia in learning among undergraduates who took economic subjects in UiTM Cawangan Sarawak. The data was analysed using Partial Least Square (PLS) and Structural Equation Modelling (SEM). Our results show that career awareness influenced the behavioural intention of using multimedia in learning economics among undergraduates. The moderating variables such as hard skills and soft skills also influenced the use behavior of students. Several policies are recommended to further improve the use of multimedia in higher learning institutions.

Keywords: Career awareness; UTAUT Model; PLS-SEM; Economics

I-CReST 2023:101-071 - Information Systems: Expectations of Internal Auditors at Work (e-SPI Study)

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ABSTRACT

In the era of 5.0, information systems are an essential tool used by all sectors of organizations to support their activities. To implement these systems, several methods, such as purchasing, developing, and building, with or without external assistance, have been employed. Consequently, their implementation in higher education institutions is of utmost importance as they significantly enhance the efficiency of tasks and functions, including those carried out by the Internal Audit Unit (SPI). The e-SPI, an independently developed system, is one such system, which is used to review the implementation process of an activity/program, starting from the planning, implementation, to reporting phases. Therefore, the aim of this research is to determine the effectiveness of the e-SPI application in assisting internal audits in higher education institutions. To achieve this goal, an exploratory qualitative approach was employed to analyze needs, design application development, implement the system, and evaluate whether the information system can aid internal auditors in carrying out internal supervision. The results demonstrate that the adoption of the e-SPI application in higher education institutions can enhance internal supervision processes by introducing and developing new control procedures that can be performed using computers. Furthermore, the study identified new risks associated with the information system that must be mitigated by implementing appropriate controls to ensure system security. Ultimately, the use of information systems in higher education institutions necessitates that internal auditors adapt and enhance their knowledge and skills in using such systems to enable them to carry out internal supervision effectively.

Keywords: Internal Audit; e-SPI; Information technology

I-CReST 2023:103-059 - The Effects of Edugames and Activity Modules on Tactile Sensitivity and Finger Dexterity in Braille Learners: A Comparative Study

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ABSTRACT

Visual impairment and blindness are one of the health issues happened globally which serve as one of the dominants disabling societal affecting the visually impaired people and people in their surroundings. These individuals face numerous challenges in their daily routine and learning, which are not experienced by sighted people. However, despite their challenges, they rely heavily on tactile and auditory senses to gather information from their surroundings. Tactile sensory input is particularly useful in explaining the environment and visual content to visually impaired and blind people. To enhance the tactile sensitivity of visually impaired individuals in learning Braille, an educational game and activity module was developed. The module included four game stations, namely rice play, sand play, playdough, and finger paint. Participants were tested on their index and middle fingers, as these fingers are primarily used in reading Braille. After participating in the games, they were re-tested for their finger sensitivity. The effectiveness of the module was analyzed and compared with previous findings. The results showed that 90% of the participants were interested in the module implementation, and there was a significant improvement in finger sensitivity, as tested using the two-point discriminator. This engaging game learning approach is not only perfect for blind and sighted players to enjoy together, but it also provides visually impaired individuals with a practical way to learn Braille.

Keywords: Game stations; Index and Middle Fingers; Rice play; Two-Point Discriminator; Visually impaired

I-CReST 2023:106-064 - The Necessity and Significance of Book Clubs: An Auto-Ethnographic Perspective

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ABSTRACT

There are definitely many and various readers the world over. So, have reading and books and the need to discuss books given rise to 'bookclubs'? The authors have undertaken to study the need as well as the significance of such clubs in Malaysia and specifically in the Klang Valley region. They have looked at various book reading circles and tried to determine what makes such clubs work. Is it the readership, the educational qualifications, interest, availability of the proposed reading material or any other significant cause that contribute to the establishment of such clubs? The researchers looked into this phenomenon by adopting the auto-ethnographic approach, focussing on the Paperback Book club which was established in 2011. There are other book clubs associated with this club which will also be examined in terms of reading lists, frequency of meets, etcetera. One interesting factor to note is the creativity of sustaining these reading circles, no matter what the circumstances. The first author's direct involvement in establishing and running book clubs will be the basis for the auto-ethnographic justification of the methodology employed. Having been a member since April 2013, the researcher has seen significant changes in the workings of the club, which boasts of both local and international members from various occupations. The findings from this study enlightened us on the driving factors behind turning up for the book meets and being at public discussions on the chosen books.

Keywords: Paperback book club; Reading circles; Book lists; Auto-Ethnographic approach

I-CReST 2023:110-074 - High-Impact Educational Practices in Higher Education Institutions: A Thematic Review

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ABSTRACT

High Impact Educational Practices (HIEPs) have been identified as effective in providing positive educational results for students from diverse backgrounds across several institutions. Despite its effectiveness in teaching and learning, prior research revealed that there is still a lack of review papers discussing the trend in the application of High Impact Educational Practices (HIEPs), specifically in Higher Education Institutions. Therefore, this thematic review (TR) paper is aimed to discuss the most common High Impact Educational Practices (HIEPs) applied in teaching at the university by synthesizing the literature from 2019 to 2023 using ATLAS.ti 23. A keyword search, followed by a filter using inclusion criteria from SCOPUS, WoS, and Science Direct databases, identified 39 peer-reviewed journal articles. However, after the inclusion and exclusion processes, only 24 articles were considered to be used as the final articles to be reviewed. A thematic review of 24 articles identified 27 initial codes grouped into the five most practiced HIEPs in Higher Education Institutions worldwide. The five main themes are engaged learning, cooperative learning, experiential learning, research-based learning, and service learning. The results of this study will benefit future studies on the application of HIEPs in teaching at the university level. They can be the main guideline for developing a good practice framework in applying HIEPs.

Keywords: High-Impact Educational Practices; Higher Education Institutions; Thematic Review

I-CReST 2023:111-075 - Effect of Mobile Application Through Scenario-Based Learning on Students' Achievement and Attitude Towards Nanotechnology in Chemistry

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ABSTRACT

In 21st century, nanotechnology field has been developing rapidly and it has been introduced in Malaysian chemistry curriculum for Form 4 and Form 5. However, students still have limited awareness and understanding of nanotechnology, there is a limited literature regarding nanotechnology teaching aid development which lead to lack of resources for teachers. Therefore, the purpose of this study is to develop a mobile application (MyNanoRia) related to nanotechnology for secondary school students in Malaysia through scenario-based learning. The usability score of the mobile application and the effects of the mobile application on students' achievement and attitude toward chemistry were also determined. 30 Form 4 chemistry students have been selected as respondents through purposive sampling. A questionnaire has been administered in this study to collect the data. The data collected was analyzed by using descriptive and inferential statistical method. The mobile application was developed by utilizing ADDIE model with usability score of 93.3%. The findings show that the mobile application has a significant impact on students' achievement and attitude toward chemistry. The results show that the developed mobile application can be utilized as a teaching tool for nanotechnology topic in chemistry education.

Keywords: Nanotechnology; Mobile application; Scenario-Based learning

I-CReST 2023:115-081 - Cashless Civilization, e-Wallets, and Acceptance: Evidence from Low-Income Group in Malaysia

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ABSTRACT

In a post-pandemic era characterized by flourishing digital payments and e-commerce transactions, the growth of e-wallets is expected to align with the global trend toward cashless payment solutions. Compared with traditional payment services, cashless payments via e-wallets offer other advantages encouraging users to utilize the technology more often. However, despite the rapid development, the level of consumer acceptance of e-wallets in Malaysia is still low and the relatively low (global) diffusion rates contrast with the potential benefit of technology. As such, this study seeks to explore the factors influencing the acceptance of electronic wallets among Malaysian low-income groups, which is considered key pioneer in envisioning a cashless society. A theoretical framework adapting an extended Technology of Acceptance Model (TAM) Theory with two additional constructs, namely trust and social influence, was applied to examine the impact on electronic wallets' acceptance. Data were collected using questionnaires correlated with 265 respondents. Partial least square equation structural modeling (PLS-SEM) was used for data analysis. The result showed that the constructs of perceived ease of use and trust influence e-wallets' acceptance. On the other hand, remarkably the social influence construct portrays to have no significant influence which suggests that e-wallet users may have concerns about the usability and functionality of e-wallets and may not be willing to adopt them unless they offer a seamless user experience. The finding should have some practical and theoretical implications, primarily demonstrating some nourishment in realizing the cashless society vision.

Keywords: Cashless; e-Wallet; Low-Income; Malaysia; Technology Acceptance Model

I-CReST 2023:116-083 - The Influence of Participation in Physical Activity on Quality of Life (QoL) among Malaysian Para Athletes

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ABSTRACT

This study is about the influence of participation in physical activity on the quality of life among athletes with disabilities (AWDs). The purpose of this study is to identify the peculiarities impact of applied physical activities to enhance the quality of life (QoL) among AWDs. The sample consists of 70 (35 males, 35 females) Malaysian para AWDs who are currently institutionalised at Pusat Kecemerlangan Paralimpik Kampung Pandan, Kuala Lumpur who participate in various sports competitions. They were stratified based on types of disabilities (learning, blind/low vision, cerebral palsy, wheelchair users, amputees and others). The study employs WHOQoL-BREF tool that consists of a 26-item self-report questionnaire that been divided into four sections mainly physical health (7 items), psychological health (6 items), social relationships (3 items), and the environment (8 items) domains, whereas the other two items measure general health and overall quality of life (QoL). All domain scores are calculated by multiplying the mean scores for all items included in every domain. The study's results showed the highest score among the four domains is the environment domain (males=18.49±1.09; females= 18.80±1.64), followed by the psychological domain (males=17.54±1.79; females=17.94±1.16), the social relationship domain (males=16.77±2.81; females=16.97±1.93) and the physical domain (males=16.49±1.88; females=17.31±1.41). The majority of active respondents reported good to very good sub-domain for each domain of the QoL There is not much difference between national para AWDs both males and females who are involved in physical activity in terms of level of QoL. AWDs who participate in physical activity will get a higher level of QoL.

Keywords: Athletes with Disabilities (AWDs); Quality of Life (Qol); Physical activities

I-CReST 2023:117-084 - Examining the Sector of Bursa Malaysia that is Most Effected by the Pandemic using the Ordinary Least Squares Method and Event Study Method

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ABSTRACT

The pandemic might cause great volatility in the stock market due to investors' investment decisions, and the movement restrictions would cause most small-to-medium enterprises (SMEs) to close. There is a lack of comprehensive views on the impact of the pandemic on all sectors in Bursa Malaysia. Hence, this paper aims to examine the sector from Bursa Malaysia that was most affected by Covid-19 using the Ordinary Least Squares (OLS) method and the Event Study Method to compare the stock returns and risks. The independent variables are the number of Covid-19 cases and the number of Covid-19 death cases daily in three countries, which include Malaysia, the United States, and China, as well as the Brent oil price. Dependent variables are the 13 sectorial indices, which are construction, consumer products, energy, finance, healthcare, industrial products, plantations, property, real estate investment trusts, technology, telecommunications and media, transportation and logistics, and utilities. By using the event study method, the daily average return, abnormal return, and expected return of each sector are studied to estimate the impact of Covid-19 in those sectors. The data used are historical data from March 18 to May 3 for 4 years, which is 2018 to 2021. The result shows that the increase in Covid-19 cases in Malaysia will decrease the 13 sector's performance. Thus, this study might help an investor have a clear understanding of the volatility and significance of the sectorial indices during the pandemic. It helps investors track the sectoral performance in the securities market since the movement of stock market indices illustrates the overall market sentiments. Also, the investor will be aware of the immediate economic effects of the pandemic and be able to maximise the return by managing the investment risk in each sector.

Keywords: Bursa Malaysia; Sectorial Indices; Ordinary Least Squares; Stock Market; Pandemic

I-CReST 2023:120-106 - A Case Study of Young Animation Designers' Identification with the Creation Scheme of Door God Painting

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ABSTRACT

This study takes as a case study the design of a conceptual scheme and the identification of an Implementable plan for young animation designers involved in the creation of door god paintings. Data were collected using the group-based interview method, participant observation, and textual analysis, and the aesthetics of folk art and the image materials of door god painting involved in the depth analysis of creation practice. It was found that the artistic aesthetics of door god painting creation keeps changing with the animation designers' understanding of traditional folk culture, and the deeper the understanding of the connotation and spirit of folk art, the better the works could be created. At the same time, young animation designers can deepen their enthusiasm for door god painting creation to a certain extent by participating in the collective discussion of creation schemes, improving their impression of the stereotypical concept of traditional culture of folk art, and the identification of creation schemes combined with digital media can effectively improve the way of inherited behavior.

Keywords: Young; animation design; Door god painting; Case study

I-CReST 2023:121-085 - Italy's Thrusting Gender Theory, Its Teaching in Public Schools, and Its Effects on Younger Students

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ABSTRACT

In Italy, recently, the so-called gender theory has flooded all sectors of public life: from TV, radio, newspapers, media, the Internet, schools, and universities to science, and political parties, becoming more pervasive and blatant each year. The term "gender theory" (also named progressive-liberal ideology) refers to the idea that there is no biological difference between men and women: differences are merely a cultural or social construct. Men and women are such because they are educated to be males or females. People are free not only to choose their own sexuality but also to change it as they wish. Gender theory is connected to gender identity: this term refers to the intimate self-perception that some people might feel about their own sexuality. This topic is now taught to Italian students who attend public elementary and high schools whose mission is to create an inclusive environment where the rights of non-binary, transgender, LGBTQIA+, gender fluid, and queer people must not only be respected but also taken into the utmost consideration. Public schools are invited to adopt the so-called "free gender registers" where students can choose their sexual identity. This qualitative research aims to investigate if this gender theory is based on science or if it is pure ideology, and its effects on teachers, students, and their parents. It is based mainly on readings of current Italian newspaper articles (2017-2023) that purport to give a realistic snapshot of life in Italian schools and the implications on students, their parents, and the educational system.

Keywords: Italy; Ideology; Public schools; Gender Theory; LGBTQIA+

I-CReST 2023:124-087 - Hak Pengguna dalam Pembelian Secara atas Talian Menurut Perspektif Islam

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ABSTRACT

Perkembangan teknologi maklumat dan komunikasi telah meningkatkan minat dan kecenderungan masyarakat untuk melakukan pembelian dalam talian menerusi pelbagai platform e-dagang seperti Shopee, Lazada, Tiktok dan lain-lain. Ia didorong oleh beberapa faktor seperti transaksi jual beli yang mudah, menjimatkan masa dan harga yang ditawarkan lebih murah berbanding kedai fizikal. Hal ini dilihat mengalami peningkatan yang ketara di mana nilai dagangan kasar e-dagang negara yang meningkat sebanyak 87% berjumlah RM62.3 bilion dalam tempoh tahun 2020 ke tahun 2021. Kajian ini dijalankan bagi mengkaji hak pengguna dalam pembelian secara atas talian menurut perspektif Islam. Islam menekankan prinsip menghilangkan kemudaratan dan membawa kemaslahatan kepada pengguna khususnya yang beragama Islam. Kajian ini mengguna pakai kaedah kualitatif dan kuantitatif dalam mendapatkan maklumat berkenaan hak pengguna ketika membuat pembelian secara atas talian menurut perspektif Islam. Data kualitatif dianalisis menggunakan kaedah analisis kandungan manakala data kuantitatif yang terkumpul dianalisis menggunakan perisian *Statistical Packages of Social Science* (SPSS) secara deskriptif. Hasil kajian mendapati sebanyak 60% hak pengguna dapat dipenuhi melalui pembelian secara atas talian dan ianya selari dengan hak pengguna yang telah digariskan dalam Islam.

Keywords: Pembelian secara atas talian; Hak pengguna; Perspektif Islam

I-CReST 2023:140-180 - Power Supply Trainer Learning Kit

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ABSTRACT

The use of Teaching and Learning Aids (ABBM) in the teaching and learning process is crucial to ensure the delivery of information related to the course being taught is clearer and more systematic. This is because most technical courses face several problems during the teaching and learning process, such as limited and outdated equipment, which can cause students to lose interest and have difficulty understanding the learning theory. The Power Supply Trainer is an innovative tool designed to be an effective learning medium that can attract students' interest and facilitate their understanding of the theory and practical work related to the Linear DC Power Supply topic in the DEE30043 Electronics Circuits course. The Power Supply Trainer was developed to replace the connection method using a breadboard, reduce student errors in making circuit connections, and save teaching and learning time in the lab in accordance with the practical learning schedule set out in the curriculum. The Power Supply Trainer allows students to easily analyze circuits because the circuit division is made according to the power supply block diagram sequence, and students can see the actual components used along with the circuit connections made. A set of questionnaires and practical result forms were distributed to third-semester students taking the DEE30043 Electronics Circuits course to obtain data related to student perceptions and the effectiveness of using the Power Supply Trainer. The impact of this innovation is an improvement in understanding and enthusiasm for practical work, as students can easily see the theory learned demonstrated with the use of the Power Supply Trainer. The proper and safe use of equipment can be applied by using the Power Supply Trainer. Time savings can also be proven as practical work can be completed within the allotted time. The working environment is more comfortable, clean, and organized because practical work steps are easier and more organized. The Power Supply Trainer should be developed for use in all other polytechnics in accordance with the requirements of the Polytechnic Education Department's efforts to produce graduates who master OBE.

Keywords: ABBM; Power supply trainer; Linear power supply

I-CReST 2023:141-102 - Reconciliation of Science and Religion in Education: A Review of Bediuzzaman Said Nursi's Thought

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ABSTRACT

Bediuzzaman Said Nursi, a prominent Turkish scholar (1877-1960) put out an alternative approach to education in which he proposed for the reconciliation of science and religion. In his works, Nursi emphasized the importance of integrating scientific knowledge with Islamic belief and practice. He believed that true knowledge could only be attained through the integration of these two fields, and that this integration was essential for the development of a comprehensive and holistic understanding of the world. Although Western scientific advancement has reached a glorious level, there is still a significant achievement difference in terms of spirituality. This may be observed in the steadily rising crime and social statistics that are compiled each year. Students of knowledge are profoundly influenced by Western academics who advocate secularism, one of the factors that contributes problem to obtaining the absolute truth. Therefore, the objective of this research is to discuss Bediuzzaman Said Nursi's perspective on the complementary roles that science and religion play in education. The research method will be descriptive-qualitative, and it will comprise a review of a number of journal articles that are relevant to Bediuzzaman Said Nursi's thoughts on education and the formation of Madrazah al-Zahra, which integrates scientific education and religious in its syllabus. The results of this study will be included into a set of guidelines that will benefit educational institutions at primary and university levels to oneness of religion and science in the curriculum.

Keywords: Reconciliation of Science and Religion; Bediuzzaman Said Nursi; Education

I-CReST 2023:142-109 - Development and Effectiveness of an Educational Board Game as Assessment Tool for Pre-University Level Cellular Biology

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ABSTRACT

The primary challenge faced by the students when learning a content-rich subject, Biology is the ability to retain the content for a longer period due to memorization is preferred rather than the actual comprehension of the subject matter. The implementation of a traditional didactic teaching style which is teacher-centred indirectly causes the biology subject to be perceived as dry. In addition, the teaching style adopted is considered ineffective teaching and learning strategy because it lacks interaction between teacher and student. Developing students' high-order thinking skills (HOTS) while teaching this topic is another challenge faced by teachers. Hence, an educational board game was developed to promote fun, engaging and interactive learning. The development of an educational board game was divided into two phases. Phase I focused on the overall development of the educational board game. The actual usage and evaluation of the developed board game were in phase II. The educational board game was modified from the snake and ladder board game. Collaborative learning and problem-solving were incorporated into the game and served as integral parts of the game design. Besides, the inclusion of elements such as instructional content, playfulness, and peer interaction was considered while drafting rules for the board game. Initially, the board game was evaluated in a pilot study and was further polished to improve the students' learning experiences. In phase II, students played and evaluated the developed board game based on five criteria: goals, design, organization, playability, and usefulness through a questionnaire. Students' evaluation of the board game has demonstrated that the games successfully enhance students' engagement while reinforcing and enriching students learning. In conclusion, an educational board game can be adopted as an effective and excellent tool pertaining to assessment for learning or assessment as learning.

Keywords: Educational Board Games; Higher-Order Thinking; Ultrastructure and Function of the Cell; Problem-Solving Skills; Collaborative Learning

I-CReST 2023:147-113 - Level of Job Satisfaction of Employees in the Department of General Studies, Sultan Idris Shah Polytechnic, Sabak Bernam

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ABSTRACT

Job satisfaction is one of the factors that influences the emotion and action of employees in carrying out their responsibilities at the workplace. Therefore, it should be paid attention to by the management so that the staff can do their work competently. This study has been carried out to measure the General Studies Department of Politeknik Sultan Idris Shah staff's job satisfaction. The instrument used in this study is Minnesota Satisfaction Questionnaire (MSQ) which comprises 20 questionnaire items aiming at identifying Intrinsic and Extrinsic factors that influence job satisfaction. It is found that the General Studies Department of Politeknik Sultan Idris Shah staff has a high job satisfaction level.

Keyword: Job satisfaction; Minnesota Satisfaction Questionnaire (MSQ); Intrinsic and Extrinsic

I-CReST 2023:152-117 - Learning Mathematics Online: Issues and Perceptions of Secondary School Students in Rural Areas

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ABSTRACT

In April 2020, the Malaysian Government ordered all students to continue their studies via online learning. Even if the instructional materials are easily accessible and the students can choose when to learn, not all students, especially those who live in remote rural areas, have access to online learning. Inadequate online learning infrastructures and limited internet access make online learning more difficult for students. Additionally, because they have limited resources and access to online learning, students belonging to underprivileged communities may encounter challenges in achieving success in online learning**.** This study was having the following specific objective: 1. To identify the perceptions and issues faced by the secondary school students in rural areas regarding online Mathematics classes and 2. To investigate students ability to cope with Mathematics online learning based on their grade and perceptions. A quantitative case study was carried out on Form 1, Form 2 and Form 4 students at a secondary school in Perak, Malaysia. The study aimed to collect data on the students' problems and issues during online learning, as well as their perceptions of learning mathematical subjects online. To gather this data, a questionnaire consists of 26 Likert-scale questions was used. The result of this research indicates that most of the students have doubt about their ability to learn Mathematics through online classes and feel that they cannot get the good grades in Mathematics when learning through online. Aside from that, majority of them agree that it is difficult to disregard and avoid distractions in their surroundings while learning through online classes. They also unwilling to attend or spend more than 15 hours per week for online classes. To summarize, students' perceptions and challenges in online Mathematics learning intertwined the students' ability to cope with online learning.

Keywords: Mathematics online learning; Rural areas; Secondary school students

I-CReST 2023:152-259 - The Significance of Game-Based Activities in Enhancing Secondary School Students' Mathematical Understanding

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ABSTRACT

In the 21st century, technology has played a crucial role in transforming teaching and learning pedagogy. One such technology that has gained traction in the education sector is gamification. Gamification has been found to enhance students' interest and motivation in learning. However, it is unclear whether teachers are aware of gamification in education and what their perception is of incorporating this method into their teaching process. Additionally, it is important to investigate the effectiveness of gamification in improving students' understanding of Mathematics. To answer these questions, a quantitative study was conducted by distributing closed-ended and Likert scale surveys to 25 Mathematics teachers in Kuala Selangor, Malaysia. The study found that most respondents agreed that incorporating gamification into their lesson plans could improve their students' fast-thinking abilities. Moreover, the results indicated that using videos in gamification applications attracts the student’s attention to learn Mathematics. Therefore, gamification could be implemented in modern teaching and learning processes in schools to enhance the effectiveness of learning for students.

Keywords: Game-Based activities; Mathematical understanding; Effectiveness of learning

I-CReST 2023:153-126 - Visitors Preferences in Fulfilling Leisure Activities at Public Open Space Case Study of Malacca Botanical Garden

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ABSTRACT

Public open spaces are deemed important parts of the cities' history and glory that some of which date back to the era of colonialism. Of their prime importance, public open spaces in Malaysia create the arenas for multivariate ethnicities to accomplish their ritual activities. With an area size of with 228-acre (92-hectare), Malacca Botanical Garden is one of the largest recreational parks in Malacca. With its size advantage, this park is an exciting place to visit and do activities. However, despite being an attraction for visitors coming from Malacca or outside of Malacca, the question that arises is regarding satisfaction of the people who come here for leisure activities. This study's objectives were to identify visitors' preferences for leisure activities and to determine visitor's satisfaction toward Malacca Botanical Garden as a public open space. Based on previous literature, visitors' preferences to do leisure activities will be based on psychology impact, facilities management and impact on society. This study used an interview method that comprised of numerous questions about the specified topic that each respondent had to answer. A total of six respondents were chosen for this interview. All respondents explained that they chose Malacca Botanical Gardens because of the large area to do leisure activities. The natural area also attracted them with a comfortable atmosphere and fresh air. They were also interested in the activities being offered such as bicycle, scooter and buggy rental service for visitors. Additionally, respondents were interested in the extreme activities at Malacca Botanical Gardens even though the activities were for not free of charge. In conclusion, even though this study indicated that respondents were satisfied with Malacca Botanical Garden's offerings, but it was found there was room for improvement such as the need to advertise the activities in mass media. Also, improvement on the facilities should be done to attract more visitors to the place.

Keywords: User preferences; Visitors perception; Parks attraction

I-CReST 2023:163-127 - Word to Insight: E-Glossary for Understanding Islam

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ABSTRACT

The effectiveness of the teaching and learning (T&L) process depends on the understanding of students of the subject matter. Nevertheless, some of the terminologies are not familiar to students especially when the general dictionary cannot provide the actual meaning in the subject matter context. This project aims to design and develop a platform that can gather the terminologies, which can be used by the Centre for Foundation Studies, International Islamic University (CFS, IIUM) students. As a preliminary step, this project adopts the subject of Understanding Islam in developing the E-glossary. Pre-and post-test assessments were given to a group of students in order to measure their vocabulary level. An online questionnaire was distributed to 500 students taking UI in Semester 2022/2023 to gather their feedback and overall experience using the E-glossary. The findings revealed that the reading speed and understanding among the students have been improved and agreed that the E-glossary can serve as a consultation tool that summarise knowledge on some fundamental that is related to the subject matters. This E-glossary project is expected to be developed further for other subjects and will be expanded to become a glossary bank.

Keywords: E-glossary; Understanding Islam; Teaching and learning

I-CReST 2023:163-129 - Flipbook: Tools for Enhancing Student's Understanding

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ABSTRACT

Teaching and instructional materials are vital components of teaching and learning. However, conventional instructional materials such as printed textbooks and notebooks cater to certain types of learners. Besides, they are not interactive and lead to boredom among students. In the digital age, instructional materials must be varied and inventive to deliver an efficient, enjoyable, and effective learning experience. A flipbook is one of the tools that can be employed. It is a digital reading experience that recreates the layout of a print publication like magazines, brochures, or conventional digital PDFs by displaying content left to right and page-flipping animation, supported by digital media such as animation, images, video, and audio. This study aims to develop the flipbook to enhance students' understanding of the subject matter in a more interactive and effective way. The tool also enables students to relate the subject matter with images and illustrations and motivates them to study independently. Simultaneously, it creates excitement among students about the learning process and leads to the effectiveness of teaching and learning mechanisms.

Keywords: Flipbook; Interactive; Teaching and learning

I-CReST 2023:170-149 - Potentiality Gamification in Improving the Understanding of Fundamental Physics: Meta-Analysis

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ABSTRACT

Gamification involves using game-design techniques and game elements in non-game contexts such as classrooms. For a learning environment to be considered gamified, it needs five basic game elements; levels, rules, leaderboards, badges, and points. This study aims to explore the efficacy of gamification when teaching physics by checking whether gamification physics can solve the misunderstanding in fundamental physics. Meta analysis used in this study in order to probe the potentiality and efficacies of game techniques in teaching physics and how the whole game structure can help solve the misunderstandings that occur in fundamental physics. Science Direct, IEEE Xplore, and ACM Digital Library were used to search for relevant articles to be included in this analysis. The investigation adopted a random-effects model to find the odds ratio to determine the effect size of the outcomes. As a result, the P-values determined the test's significance. The overall test results reveal a random effects size and odds ratio of 25.32 [1.75, 48.89] at 95% CI. This meta-analysis shows a significant impact on the student's performance in the event gamification elements are introduced in the learning environment (P = 0.04). The studies used to analyze this were highly heterogenous (I2 = 99.96%).

Keywords: Game-based learning; Basic physics; Meta-analysis

I-CReST 2023:186-145 - A Study on Mathematics Interest, Self-Esteem and Mathematics Achievement among Physical Module Students at Centre for Foundation Studies, IIUM.

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ABSTRACT

Interest stimulates learning, which is a significant motivational factor that influences academic and professional paths and is essential for academic achievement. Therefore, a student's passion in mathematics is vital for inspiring them to perform well in any mathematics course. Self-esteem, which is known as attitude about oneself, is also another crucial factor that contributes to successful academic achievement. The objective of this study is to investigate the gender differences in mathematics interest, self-esteem, and mathematics achievement among physical module students and explore their interrelationships. Purposive sampling technique was used to select a sample of 310 physical module students who are taking mathematics in Centre for Foundation Studies (CFS), International Islamic University Malaysia (IIUM) for session 2022/2023. The instrument used was Academic Interest Scale for Adolescents (AISA) to measure the mathematics interest while the Rosernbeg Self-Esteem Scale, which measures self-esteem. According to the findings, there exists a positive and significant relationship between mathematics interest and self-esteem. Moreover, it is also found that there is a significant difference in both students' mathematics interest and their mathematics achievement by gender.

Keywords: Mathematics interest; Self-esteem; Mathematics achievement; Gender biases

I-CReST 2023:198-273 - Examining the Malaysian Hospitality Workforce Crisis: Exploring Hospitality Students' Post-Pandemic Intention to Enter the Industry

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ABSTRACT

In line with Twelfth Malaysia Plan which wants to develop future talent, skilled manpower in the hospitality and tourism industry is very much needed. To achieve this goal, the government has revamped and shaped Malaysian educational institutions. It started with a new vision followed by planning and execution to accomplish the goal. However, the findings of previous studies (Anis et al., 2017) show a negative phenomenon where not many students who have graduated join this industry. It is compounded badly by the high turnover rate of workers in this industry. This problem has attracted the interest of researchers to understand from the students' point of view their perception and their interest in the hospitality industry. The researcher emphasizes student perception on pay benefits (PB), parental influence (PI1), career development (CR), and personal interest (PI2) and how that affects students working intention (WI). Execution of a convenient survey using an online platform is the most appropriate method in conducting this survey as Gen-Z and above is more attracted to interact with an online platform. Pearson correlation and regression analysis are used to analyse the gathered data as this. The findings of this study were very interesting as the data show that 3 out of 4 variables studied do affect students' desire to work in the industry. This study is expected to provide some data to the industry regarding the recruitment requirement and offer to student from higher education institutions which represented the skilled worker for hospitality industry.

Keywords: Pay benefit; Parental influence; Career development; Personal interest; Working intention

I-CReST 2023:198-277 - Equipping Generation Z for Career Opportunities in the Hotel Industry: Challenges and Strategies

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ABSTRACT

Generation Z refers to individuals born between 1997 and 2012 is a generation growing up in an entirely digital age and interconnected world. As an industry notoriously slow to implement technology, the hotel industry is alarmed by Gen Z's dependence on technology in their daily and also work environment. Besides that, there is other challenge faced that need to be address by Generation Z in pursuing careers within the hotel industry. This arising issues has opened an opportunity for researcher to investigate more on this issue. The research direction encompasses three key aspects: (1) understanding the challenges faced by Generation Z in entering the hotel industry, (2) investigating the underlying factors contributing to these challenges, and (3) proposing effective strategies to mitigate them. Utilizing the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework as a research guide, the paper provides a comprehensive overview of the challenges. To investigate the challenges, a comprehensive analysis of existing literature and industry reports is conducted. The Scopus and Web of Science databases were utilized to ensure a thorough exploration of scholarly publications. However, the review revealed a limited number of publications specifically discussing Generation Z in the context of the hotel industry, indicating a research gap that requires further exploration. Despite the scarcity of literature, the study synthesizes the available research to shed light on the unique challenges encountered by Generation Z in the hotel industry. Drawing upon the findings, the paper proposes strategies to equip Generation Z for success in the hotel industry. These strategies encompass a range of initiatives, including targeted educational programs, practical training opportunities, mentorship programs, and promoting digital fluency. The aim is to empower Generation Z with the necessary skills, knowledge, and adaptability to thrive in the dynamic and competitive hotel industry. By identifying and addressing these challenges through evidence-based strategies, this study seeks to provide valuable insights for educators, industry professionals, and policymakers involved in preparing and supporting Generation Z's entry into the hotel industry. Future research should prioritize investigating this under-researched area and exploring innovative approaches to optimize Generation Z's integration into the evolving hospitality sector.

Keywords: Generation Z; Systematic Review; Hotel industry; Skill; Challenge

I-CReST 2023:200-156 - Acceptance of Sultan Idris Shah Polytechnic Arabic Course Students to the M-Hiwar Application Using the Technology Acceptance Model (TAM)

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ABSTRACT

The climate for teaching and learning has changed since the Covid-19 pandemic. Students today need teaching and learning methods that include technology. A descriptive study must be carried out to ascertain the extent and relationship between the factors affecting student acceptance of the M-Hiwar application. Cronbach's alpha reliability for a pilot study with 30 students was 0.940. Students in the Department of Commerce who attended an Arabic course in their second and fifth semesters were the main subject of this study. This study's sample comprised 73 respondents, and it used a questionnaire to get their opinions. The mean, standard deviation, and correlation were determined using SPSS version 25.0 software, which stands for Statistical Package for Social Science. According to the findings of the descriptive analysis, the perception of effective use (PU) component had a mean value of 4.59 and the perception of ease of use (PEOU) factor had a mean value of 4.54. While the variable Attitude (AT) had a mean score of 4.53 and Behaviour (BI) a mean value of 3.67. With a correlation value of 0.832, the findings of the Pearson's Correlation test study revealed a highly significant association between effective use and attitude. With a correlation value of 0.506, the association between the variables of ease of use perception and behaviour is somewhat significant. Conclusion: Despite the positive feedback from students regarding the application's effectiveness and perceived ease of use, there are still a number of aspects, such as attitude and behaviour, that need to be taken into consideration if the method of instruction and learning using the M-Hiwar application is to be as effective as possible for all students taking Arabic courses.

Keywords: M-Hiwar application; Ease of use; Behavior; Arabic language

I-CReST 2023:205-162 - Translating Concepts: Contemporary Encounters with Confucius

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ABSTRACT

For a long time, most of Confucian translators tried to translate Confucianism by uniform translation (or word-for-word translation). Confucian concepts were thus either rendered into Western words in the manner of modern science close to fact-depicting, or vessels containing straightforwardly identifiable beliefs and abstracted, lifeless meaning and sense. The difficulty is that not only do Confucius become the “straw man” for Western cultures, but the story of Confucius is concealed or distorted in Western concepts rooted in European experience. The solution is that something other than science is needed if Confucian thought is to hold in its own terms. A new model of Confucian understanding for translators is involved here: Only through delving into the deeper workings of Confucian concepts right back from forgotten experience, does a humane opening of the self to the presence of Confucius come into light.

Keywords: Confucianism; Translation; Concepts; Confucius

I-CReST 2023:220-175 - Factors That Affect Consumer Buying Behavior Among Youth in Perak in The Covid-19 Endemic Phase

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ABSTRACT

Every aspect of people's lives worldwide has been impacted by the Covid-19 pandemic, which has changed the rhythm of human life and forced people to change their lives. The government of Malaysia has enacted a 14-day Movement Control Order (MCO) to stop the spread of the Covid-19 outbreak. As a result, people must stay home, which has made online shopping very popular. As the situation improves, Malaysia has shifted from a pandemic to an endemic stage. Therefore, this research aims to understand youth buying behavior at the endemic stage of Covid-19. Also, to identify the relationship between factors and the gratification of youth's buying behavior. The quantitative research method was used for this study, and an online survey was distributed to 356 Perak residents between the ages of 15 and 24. The purposive sampling method was used for sampling. The findings identified three major factors influencing consumer purchasing behavior among youth in the Covid 19 endemic phase: psychological, economic, and social factors. All hypotheses are consistent with earlier research and findings and show a positive relationship between factors and the gratification of youth purchasing behavior. According to the results, most respondents are students without income who enjoy and are satisfied with visiting online stores due to influences such as family and friends and price discounts.

Keywords: Buying behavior; Youth; Psychological factor: Social factor; Economic factor

I-CReST 2023:224-186 - Impact of Young Adult Online Information Sharing Behaviour

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ABSTRACT

Technological advancement such as Information and communications technology (ICT) has changed the way we live. One significant change is the way people share and access information. Information such news and personal details can sometime be manipulated by third party. Thus, this information facilitates cyber bullying among younger generation and lead to low satisfaction and well- being. This also can lead to social problem among them. Thus, this study tries to discover impact and the behavioural pattern of online information sharing among younger generation in Malaysia. One of the reasons is to discover the pattern and to provide as guideline model in understanding the younger generation. This study will adopt a quantitative method and questionnaires will be used as the instruments for data collection from related respondents. Significantly, the result will contribute in facilitating community growth that embrace information and high quality future leader.

Keywords: Young adult; Information sharing behaviour; Higher Learning Institutions

I-CReST 2023:226-187 - Common European Framework of Reference (CEFR): The Quality of Implementation Among Secondary School English Teachers in Batang Padang, Perak

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ABSTRACT

Common European Framework of Reference for Languages: Learning, Teaching, Assessment (CEFR) has been implemented in Malaysian National Education System under the MBMMBI policy. MBMMBI stands for 'Memartabatkan Bahasa Malaysia Memperkukuh Bahasa Inggeris' or in English; it is termed 'To Uphold Malay Language To Strengthen English Language' policy. Since CEFR is a relatively new introduced policy and from the literature encountered by the researcher, most researchers study teachers' views on the implementation of CEFR. Therefore, the researcher identified a gap and decided to study this issue from a different perspective: the quality of implementation in CEFR with regards to dosage, fidelity, quality of delivery, and acceptability (Albers and Pattuwage, 2017). This study used a survey design to collect the data. This study took place in Batang Padang, Perak. This study involved 99 secondary school English teachers from 25 schools in Batang Padang. Based on the findings, majority of the secondary school English teachers scored either moderate or high level of implementation in CEFR. On the contrary, none of the indicators of the implementation quality scored low level. The second research questions reveals that Experience in Teaching English and CEFR-Related Training Completed are factors affecting the quality of implementation in CEFR. The findings for third research question revealed that there are significant relationship between the indicators of the quality of implementation in CEFR.

Keywords: CEFR; MBMMBI; Quality of Implementation

I-CReST 2023:228-190 - Effectiveness of Video-Based Learning for Sciences Students in Centre for Foundation Studies (CFS), International Islamic University Malaysia (IIUM)

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ABSTRACT

Higher education learning methods have evolved rapidly from traditional placed-based classrooms to blended learning. Video-based learning has been actively used to create an accommodatable learning process. This study is aimed to measure the effect of video-based learning on Sciences students in CFS IIUM. This study was conducted in Semester 3, 2022/2023 academic year. The use of video in science learning allows students to observe science concepts in action and helps them to visualize complex processes. The survey focused on the student's perspective to see the effectiveness of the video. The video-based learning provided by the lecturer consists of videos from Youtube and pre-recorded lecture videos. The prepared video is made by using multiple software such as powerpoint, active presenter, etc. The videos help to provide more accessibility for students during their learning process and could help to provide more visual and animation to develop understanding of the content. We have conducted an online survey by using Google form with Likert scale to analyze our targeted group. The finding reveals students' favor towards video in their learning process. Students prefer to have videos as a learning aid, which provides flexibility in study. Besides, students found that video is convenient to deliver the content for some topic. They also agreed that, by having only video as a learning material, it does not improve their performance in examinations. Based on the result, it can be summarized that students have a tendency to favor using videos as a learning medium, which provides flexibility for revision.

Keywords: Video-based learning; Effectiveness; CFS IIUM

I-CReST 2023:229-193 - Analysis of the Impact of User Interface Design in eLearning among Higher Learning Institutions in Malaysia

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ABSTRACT

Over the past years, eLearning has become a global trend in higher education. Since the beginning of the technological revolution, higher education institutions have been pursuing technological adoption through digital transformation strategies. The transition from a traditional to an eLearning education system is fraught with information and communication technology (ICT) issues as well as operational dangers. Operational risks in ICT primarily limit effective use of eLearning systems. Faculty eLearning experience, reluctance to change, and the quality of eLearning are the main drivers of operational hazards in higher education. The quality of eLearning includes the content design, user interface design and the interaction between eLearning and the users. User interface design can affect user satisfaction in eLearning systems, and it could also have a significant impact content design which leads to unhappiness of a learner or an instructor. The success of an eLearning system installation is heavily influenced by the interface design. The effectiveness of user interface design is such that it can be the deciding factor between a highly successful programme and one that fails to create an impression or, worse, makes a negative impression on the user. The goal of any user interface design is to make the user's interaction as simple and efficient as possible with limited-human-related support, thereby alleviating the hassle of possible complex navigation and instruction. This is because the educational design is complex, and the main purpose of developing eLearning content or courseware is to achieve specified goals in education and place the user's needs at the center of the learning process. This study analyse the impact of user interface design in eLearning through observation and related literature among selected higher learning institutions in Malaysia. Through this study, it would provide a better understanding towards the importance of user interface design for eLearning usage.

Keywords: eLearning; User interface design; Higher Learning Institutions

I-CReST 2023:230-191 - Mobile Application for Streetwear in Malaysia: The Role of User Interface Design in a Digital Platform

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ABSTRACT

The 1990s popularized streetwear. Sportswear, punk, skateboarding, and Japanese street fashion originated from New York hip hop and California surf culture. It emphasizes "casual, comfy pieces like jeans, T-shirts, baseball caps, and shoes" and exclusivity thru product scarcity. Brand fans hunt limited editions. Several streetwear firms rivaled the most famous fashion houses in the 2010s. Complex Magazine called Stussy, Supreme, and A Bathing Ape the greatest streetwear companies, and some of them collaborated on coveted high fashion capsule collections, including Supreme with Louis Vuitton, Fila with Fendi, A Bathing Ape with Commes des Garcons, and Stussy with Dior. Global clothing revenue is higher than ever. Digital transformation has driven industrial innovation. Innovation is using ideas to create new products or services or enhance existing ones. Product design was the only area of innovation. Innovative companies maintained market share. Innovation, unlike invention, requires the practical implementation of an idea to have a substantial impact on a market or society. This project designed a new streetwear media platform by merging all streetwear companies to assist customers purchase clothes. Next, to analyze the site that sells all urban youth clothes businesses. Finally, to offer a new media platform for urban young users that makes it easy to search, purchase clothes, and develop a live auction area. A new platform for urban youth will improve user interface design and retail experiences like shopping for clothes. A new media platform would mix font, symbol, picture, space, and colour for consumers, making everyday fashion purchases easier. This research also found that a solid digital platform may enhance clothing purchases.

Keywords: Mobile application; Streetwear; User interface

I-CReST 2023:237-196 - Exploring Semiotics in 2D VFX Animation with Augmented Reality (AR)

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ABSTRACT

The semiotic approach studies sign language to provide the interchange of messages while communicating. 2D Visual Effects, refers to the application of visual effects techniques in two-dimensional animation. The elements of semiotics in 2D VFX involve the use of signs, symbols, and visual communication techniques to convey meaning and messages in the animation. By applying semiotics in 2D VFX, animators can effectively communicate messages and ideas even without verbal communication or interaction. Additionally, it seeks to evaluate the improvisation of 2D VFX with AR from a semiotic perspective. The lack of comprehensive research on the application of semiotics in 2D Visual Effects animation and its potential immersion in Augmented Reality (AR) poses a challenge in effectively conveying messages and meaning to viewers. This research aims to explore the effectiveness and possibilities of incorporating semiotics in 2D VFX with potential immersion in Augmented Reality (AR), in order to enhance communication and audience interpretation in animation. The research adopts a qualitative methodology, collecting and analyzing data during a focus group through observation in 2D VFX class. The findings reveal animators' understanding of the semiotic approach in their work, allowing them to effectively convey their creative ideas while empowering viewers to interpret their messages. In conclusion, this research holds significance for animators, students, and those interested in exploring diverse techniques and immersive experiences in 2D VFX animation.

Keywords: Semiotic; Animation; 2D Visual Effects (VFX); Augmented Reality (AR)

I-CReST 2023:237-197 - Animatic in a Nutshell: Animated Storyboard

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ABSTRACT

An animatic serves as a planning tool for animation, allowing for the precise sequencing of shots and soundtrack. An animatic essentially consists of a series of storyboard images arranged in the correct order to narrate the story. However, there is limited research focused on the animatic within the pre-production pipeline. Many students encounter difficulties at the initial stages of pre-production, such as the inability to effectively convey the storyboard images in their intended storyline and the absence of a standardized resolution format. Hence, this study aims to emphasize a workflow method that covers the entire process, starting from the conception of the idea and concept, all the way through to the execution of the animatic itself. By establishing this workflow method, educators can provide students with a valuable tool to facilitate brainstorming and the creation of composite animatics for animation. Additionally, this workflow method can be implemented across other animation subjects that involve storytelling and the production of short animated films.

Keywords: Animation; Storytelling; Animatic; Storyboard; Pre-production

I-CReST 2023:238-198 - Cultural Influences in Character Design to Portray Diversity of Malaysian Worldbuilding

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ABSTRACT

Malaysia has a strong heritage of unwritten storytelling and rich mythology which may be a valuable source of inspiration for Worldbuilding in RPGs. Game designers and developers often work to create characters with a sense of history, motivation, and personality. Creating a believable character in Worldbuilding requires understanding the process, which involves crafting fictional maps, inventing new rules, and imagining aspects like law, culture, and environment. By incorporating traditional Malay motifs, themes, and elements from Malay folklore and legends into the design of game worlds and characters design, these regulations can be effectively reflected. Local game developers may have a limited understanding of what appeals to Malaysian players in terms of character design. They have recognized that cultural and ethnic representation in games significantly influences player preferences. The objective of this study is to tackle the difficulty confronted by local game developers when it comes to crafting characters that resonate with players in Malaysia. However, this research aims to highlight the multicultural nature of Malaysia by incorporating characters in RPG games that represent various races, skin tones, and religious symbols. The study will go through a qualitative method with cultural analysis through semiotic theory by Kroeber & Kluckhohn on the definitions and a general discussion of cultural theory. The researcher will integrate this method to transform the depiction and perception of characters in Worldbuilding in-game. In conclusion, it is being held with the goal of assisting aspiring designers in realizing the significance of character design in having their own identity and culture in the future and accurately portraying the diverse features and population of Malaysian Worldbuilding.

Keywords: Character design; Culture; Malaysia; Semiotic Theory; Worldbuilding

I-CReST 2023:240-208 - Assessing the Conditions for Establishing Vicarious Liability in Malaysia: A Case Study of GMP Kaisar Security (M) Sdn Bhd v. Mohamad Amirul Amin bin Mohamed Amir [2022] 6 MLJ 369

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ABSTRACT

Negligence is the failure to exercise reasonable care to prevent causing injury or loss (harm) to another person. Consequently, this grants the aggrieved party the right to pursue legal action against the tortfeasor for the harm suffered. In situations where the tortfeasor committed negligence while acting as an employee, the question arises as to whether the employer can also be sued. Generally, the employer can be sued under vicarious liability subject to several conditions. This research adopts a doctrinal approach involving a detailed analysis of the relevant case law and scholarly writing related to this area. The research found that while the concept of vicarious liability has been long recognised in Malaysia, there is a certain issue that may cause ambiguity in its application. What happens if the employee's actions were not authorized by their employer but were closely connected to their employment? Would it be fair and just to hold the employer vicariously liable? Referring to the case of *GMP Kaisar Security (M) Sdn Bhd v Mohamad Amirul Amin Bin Mohamed Amir* [2022] 6 MLJ 369, the Federal Court held that employee's shooting was closely connected with his employment. On this basis, it was fair and just to impose vicarious liability on the employer despite the fact his actions may have been unauthorised by the employer. However, this flexible approach may offer limited protection to employers who have taken preventive measures to avoid such harm. This research therefore aims to analyse the conditions for establishing vicarious liability in Malaysia, with reference to the case law.

Keywords: Negligence; Vicarious liability; Harm; Employer; Employment

I-CReST 2023:246-214 - The Effectiveness of Flipped Classroom in Enhancing Students' Mastery Level in Using Passive Voice

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ABSTRACT

Flipped Classroom has emerged as a viable alternative to conventional lesson as it provides ample time for students to explore the subject matter prior the class, and extra time to practice during in-class activities. The main objectives of this study are to measure the effectiveness of flipped classroom; and to study students' perception towards flipped classroom. Furthermore, the researchers also seek to identify the educator's readiness in adopting flipped classroom for their grammar courses. The participants were 150 Semester 2 and 3 students from Polytechnic of Muadzam Shah. Pre-test and post-test were given to both experimental and controlled group to measure the mastery level in using passive voice. Two questionnaires were also employed to elicit students' perception towards flipped classroom for grammar lesson and to study the educator's readiness to use flipped classroom for their classes. The data were analysed and reported using Statistical Package for Social Science (SPSS) version 24. Findings suggest that the experimental group showed a greater improvement than the controlled group in using passive voice after the implementation of flipped classroom. The students also believed that flipped classroom is useful, giving them a sense of autonomy, while providing more engagement, satisfaction, and motivation. The educators also showed a positive response where they would consider adopting the flipped classroom in their teaching.

Keywords: Communicative English; Flipped classroom; Grammar; Passive voice

LEVERAGING TECHNOLOGICAL ADVANCES AND MULTIDISCIPLINARY RESEARCH FOR A SUSTAINABLE FUTURE IN EDUCATION
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I-CReST 2023:258-228 - An Ethical Discourse For Scientific Research; A Preliminary View From The Perspective Of Islam

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ABSTRACT

This article will be focusing on the Islamic main reference; the Quranic and Prophetic Hadith perspective on an ethical foundation for scientific development. However, in this present decade, science was primarily viewed from a neutral stand without any strings attached to religious ethics. Ethics per se now in scientific perspectives are relative. What today is considered lawful or legal might change tomorrow, based on a fanciful, idle play of rationalism and idiosyncratic, claims such as personal rights and humanism. Just have a glance at what happened to the research in nuclear physics to the catastrophic destruction in Hiroshima and Nagasaki. Bioterrorism is another classical case of how scientific development without ethical foundations will lead to destruction. Nowadays mankind seems to be at the end killing themselves more efficiently now with an armamentarium as a gift from science. These tragedies are solely not due to the science per se but to the loss of the firm's deeply rooted ethical foundations based on revelation. Reviewing back the age of Islamic Science and Civilization from Baghdad to Cordova, we will astonish to discover scientific development was parred excellence and par ahead of centuries and at the same time generating peace, serenity, harmony, and tranquillity for mankind. No mass man-killing machine was formed to massacre human beings, regardless of race, creed, or language. Scientific products then lead the producer as well as the consumer to revive the consciousness of the All-Powerful and Al-Mighty God. In this context, science in the Islamic view is to attain self-righteousness (Taqwa) and to gain mercy (Rahmah) from the creator (Rabb). The mindset and the thinking paradigm of the scientist then were firmly rooted in ethical foundations expounded in Al-Quran and al-Hadith. To review the same spirit we have to develop science based on the same ethical foundation. Thus Einstein famously said science without religion is blind and religion without science is lame.

Keyword: Ethics; Islam; Science

I-CReST 2023:278-250 - Exploring the Implementation of Halal 'Test For' Approaches among Halal Industries

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ABSTRACT

The halal system is an essential part for the product and services, not only to meet the Islamic standards but, is required for products that are intended for the Muslim market. The halal market has become part of pivotal sector for Malaysian business and economic growth, making the current halal system getting more attention. Many studies had reported that halal systems encounter several issues and challenges that can lead to delay in the certification process. Among them are the issues involving halal documentation and the incompetency of halal executives to verify halal status that can hinder its effectiveness. However, a scientific approach of Halal 'test for' is used as one of the approaches to technically verify the entire supply chain process, starting from the raw material to the end product. Despite the advantages of providing reliable and accurate results, a preeminent study on the limitation of halal 'test for' is needed to sustain the halal status more efficiently. Hence, this paper aims to discuss the implementation of Halal 'test for' in the Halal industry, specifically in Malaysia. Apart from reviewing related literature, in-depth interviews was conducted with the halal industry players, accredited laboratories, halal competent authorities. The finding indicates that the Halal 'test for' approach is recommended in the current internal control system of all sizes of companies to sustain the integrity in halal management system. Therefore, it was deemed crucial for this study to develop a prominent process of Halal 'test for' businesses of the growing halal market and increase consumer trust in their products. Furthermore, the use of a Halal 'test for' is deemed an effective approach for specialized analytical methods.

Keywords: Halal 'test for'; Halal Management System; Halal laboratory analysis; Food adulteration; Authentication

I-CReST 2023:281-242 - Exploring the Potential of TikTok as a Supplementary Tool for English Language Learning among Students

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ABSTRACT

The transformation of social media into a profound educational platform holds the potential to augment students' mastery of the English language, thereby facilitating substantial advancements in their linguistic competence. The introduction of TikTok has led to its rapid acceptance and preference among youth, establishing it as a favoured social media platform. To explore the potential of TikTok as a supplementary tool for ESL, English as a Second Language learning, a set of questionnaires was distributed to 190 students from various courses at Universiti Teknologi MARA (UiTM), Shah Alam Campus. Results revealed that there is a strong preference for utilising the platform in language learning as it fosters a sense of comfort and effective learning, allowing students to enhance their English language skills and establish familiarity with the language. Thus, the findings of this study demonstrate the considerable potential of TikTok as a supplementary tool for English language learning among university students. However, further research is required to explore the pedagogical implications of integrating TikTok as a tool in language learning curricula.

Keywords: English language learning**;** Second language learning; Social media**;** TikTok; language learning tool

I-CReST 2023:281-243 - Testing the Effectiveness of Integrating TikTok into English Language Learning

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ABSTRACT

Recent studies have shown that TikTok has emerged as a preferred platform for language learning among students, owing to its highly engaging and interactive features. Therefore, the present study aims to investigate the effectiveness of integrating TikTok into English language learning among undergraduate students. To gauge the efficiency, TikTok is used as a platform for conducting a corporate social responsibility video assessment for ELC081 - English for Foundation Studies II. A sample of 1200 students was involved in this study, comprising 600 students from Cohort I and another 600 students from Cohort II. A t-test is conducted to compare students' English language performance from these two cohorts. Results revealed that there is a significant difference in students' performance between the two cohorts, as evidenced by the t-value of 2.53 ($p < 0.05$), indicating that students' English language performance improved significantly in the first cohort compared to the second cohort. Nevertheless, further studies should be incorporating all four language skills through TikTok to ensure the effectiveness of language learning and testing.

Keywords: English language learning; Second language learning; Social media; TikTok; Language testing

I-Crest 2023:284-257 - Computer-aided Experiments as a Learning Tool in Learning Physics at the Center for Foundation Studies, IIUM (CFS IIUM)

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ABSTRACT

Physics is comprehended by students as an intricate and tough subject, hence innovative approach in teaching Physics is very essential. Students shall be engaged and motivated in learning Physics whenever they have an interest in Physics. Conducting experiments as one of the methods used to help the students in understanding physics concepts could promote interest in students. This study presents the role of computer-aided experiments as a learning tool in making the physics subject more interesting at CFS, IIUM. To ensure the students are more engaged in the learning process the practical session in the laboratory is embedded in between the classroom theory session. The experiments established in our laboratory comprise of manual experiments and computer-aided experiments. In performing manual experiments, the experimental data is gained by using a ruler, stopwatch, thermometer or by direct observation. Apart from the manual experiments, the students are also performing computer-aided experiments. These experiments use sensors linked to an interface namely the Science Workshop and connected to computer with Data Studio software as a data acquisition, display and analysis program. Three computer-aided experiments conducted in our Physics Laboratory were discussed in this paper, explicitly the Standing Wave, Induction and Simple Harmonic Motion. The technique in performing computer-aided experiments is providing automation in controlling and manipulating the parameters, analysing process in creating graphs efficiently and the data can be examined directly and accurately in real-time by the students. A questionnaire with six survey items on computer-aided experiments was distributed to CFS IIUM students undergoing physics courses. Of 178 respondents, more than 80% agreed on the use of computer-aided experiments enhanced their interest and ability to integrate theory with practice in learning physics.

Keywords: Computer-aided experiment; Learning tool; Data studio; Science workshop

I-CReST 2023:285-265 - Limiting Prime Minister Tenure in Malaysia Parliamentary System of Government: From a Legal Point of View

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ABSTRACT

Malaysia Parliamentary system of government have practiced democratic governance since its first session in 1957. The Yang Di Pertuan Agong (YDPA) as the Head of State is empower by the Federal Constitution to appoint any members from Dewan Rakyat who in His Majesty judgement is likely to command the confidence of the majority members of Dewan Rakyat. Only 9 members of Dewan Rakyat have ever appointed to the position of Prime Minister since 1957 after 15 General election. Unlike Presidential system of government, which normally limit the tenure of a President to two term of four year each, there is no limit on the tenure of any Prime Minister as long the appointment is according to the provision stipulated within Article 43 of Federal Constitution of Malaysia. The Constitution of Malaysia emphasize only two main priority in the appointment of Prime Minister which can be summarize as the prerogative power of YDPA and the members of Parliament must hold the majority confidence of Dewan Rakyat. This practice have ensure democratic governance as its core function and confirming majority rule in Dewan Rakyat that become the main voice of people representatives. However, this practice may create another dilemma of bureaucratic polemic since it could allowed any members of Parliament to clinch the power in such substantial tenure as long the members hold the confidence of the house of representative. Executive power can project immense power and the cloth of administration will enable unrelenting advantageous towards the people that wield it. This research intend to explore further the notion of limiting Prime Minister tenure in Malaysia system of government by reviewing its legality, practicality and rational. Doctrinal analysis from secondary sources is used in this research. This research found that limiting Prime Minister tenure acquire certain modification in our law and the initiative of political party. Research recommend further discussion on the tenure of Prime Minister in order to guide the law makers and public at larger of the importance of such notion.

Keywords: Constitution; Limitation; Tenure; Prime Minister

I-CReST 2023:289-252 - The Challenges of Building Information Modelling (BIM) Implementation in the Quantity Surveyor Profession

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ABSTRACT

Building Information Modelling (BIM) has been established for more than a decade in Malaysia's construction industry. However, BIM adoption is still lagging in Malaysia, as only a small percentage of Quantity Surveying (QS) companies are using BIM. Therefore, this research explores the challenges of BIM implementation in QS profession. The objectives of this research are (1) to study the developments of BIM implementation, (1) to investigate the challenges of BIM implementation in QS profession and (3) to study the strategies of BIM implementation in QS profession. To achieve the objectives, a questionnaire survey was distributed to 250 Consultant QS in Selangor and Wilayah Persekutuan Kuala Lumpur based on data from the Board of Quantity Surveying Malaysia (BQSM) websites. 120 numbers of responses (48%) were gathered. Statistical Package for Social Science (SPSS) software was used to analyse the data. The results indicated that the implementation of BIM improves communication and information coordination among project stakeholders. The biggest challenge faced in BIM implementation in QS profession is the lack of awareness of BIM among stakeholders. Besides, respondents agreed that integrating BIM in education also a measure towards implementation of BIM in QS profession. Therefore, BIM implementation should be well embraced towards preparing QS profession for the future technology development.

Keywords: Challenges; BIM; Quantity Surveyor

I-CReST 2023:292-263 - Process of the Design Conceptual Stage in the Architectural Design

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ABSTRACT

The paper aims to establish the processes that involve in the design conceptual stage of the architectural design process. The approach to studying its processes is looked at at both perspectives of the linear form which is more tangible and the cyclic form which is more intangible of the cognitive area. Both are equally critical to understand the necessary factors of a creative product that is both unique and functional for users, society, and the environment. The method used to establish the processes is a thematic review from three top journals of architecture and design cognitive in 2023. The review summarises established concepts and found new aspects of the process.

Keywords: Design process; Design cognitive; Design concept; Architectural design

I-CReST 2023:299-260 - Students' Evaluation of Language Teaching and Learning using Microsoft Teams

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ABSTRACT

Realising how crucial is language acquisition is in our interconnected society, educators often seek innovative ways to use digital tools to teach students. Microsoft Teams has emerged as a versatile platform with promising potential for language teaching and learning amongst various digital options available. However, to reach its full potential, it is important to consider and address students' perception of language learning via Microsoft Teams which will then allow instructors and course developers to create a positive and effective learning environment that maximises students' engagement, satisfaction, and language learning outcomes. Therefore, the purpose of this study is to look at learners' perspectives of language teaching and learning using Microsoft Teams. It aims to examine students' language acquisition, engagement, and assessments' accomplishments on Microsoft Teams. In addition, the study intends to investigate potential links between learning, engagement, and assessment components of online language learning utilising Microsoft Teams. This study employed the quantitative method. In terms of the instrument, a survey was used. Students were given a questionnaire that has four sections: demographic profile, learning experience, interaction, and assessment achievement. 168 students from a Malaysian public university completed the questionnaire. The results showed that students had a favourable perception of their online learning experience, interaction, and assessment achievement when using Microsoft Teams. The findings also revealed a notable correlation between the three components of the instrument, namely interaction, assessment, and the learning dimension. The research suggests that instructors must grasp the potential benefits and limits of Microsoft Teams to properly use this platform, thereby increasing language acquisition results and empowering learners on their language learning journeys.

Keywords: Online language learning; Microsoft Teams; Students' perceptions

I-CReST 2023:304-271 - The Application of Design Thinking for Vocational Education in China

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ABSTRACT

Design thinking is an innovative approach that emphasizes more on solution-based than problem-based since it is user-centric. It's the thought process of inventing a new way to deal with a problem or class of problems. The main aim of this paper is to improve the teaching framework and learning activity design of China's vocational education curriculum system. In this study, 46 Chinese participants were invited to cultivate Design thinking in the form of experimental courses. This research employs diary method to track and record the learning process of participants. The results show that Design thinking plays a positive role in the reform of vocational college curriculum system. New curriculum mode based on Design thinking can greatly stimulate the participants' learning enthusiasm. Participants can improve their ability of innovation and creation, observation and teamwork in the learning process. By improving the curriculum of vocational colleges in China, our research will make more people realize the importance of Design thinking for talent training and provide a meaningful new attempt to train Design talents in China.

Keywords: Design thinking; Dairy method; Vocational education; Creative ability

I-CReST 2023:310-278 - Promotion of Student Engagement Through the Implementation of ClassPoint

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ABSTRACT

The concept of student engagement and interaction has become an enigma for educators. Recognising the inherent role that technology now plays in education. A synchronous Classroom Response System called ClassPoint was implemented together in face-to-face classes for the final semester foundation student in HWUM as it allowed real-time interaction between the instructors and students. ClassPoint enables instructors to integrate and transmute existing Microsoft PowerPoint slides into interactive gamification features. The Classpoint was recently developed; hence, the availability of its literature on its effectiveness as an engaging tool during lessons is limited. The purpose of the paper draws on a range of student engagement and its interaction towards Classpoint usage in teaching and learning. The study has utilised convenience sampling. The survey showed that more than 80% of the student participants felt that ClassPoint was an effective platform to promote student engagement and participation in class. Overall, ClassPoint interactive features and their utilisation encourage student interest and interaction in learning.

Keywords: Classroom Response System; ClassPoint; Student engagement

I-CReST 2023:318-285 - Project Alpha: Exploring the Impact of Digital Technologies into Creative Works among Creative Arts Students at Higher Institution

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ABSTRACT

Enabling students to leverage new technologies for education is essential in preparing them for the future and exposing them to new emerging trends. By encouraging students to experiment and explore different technologies will allow them to find the ones that align with their artistic vision and creative process. Yet, little is known about the students' perspective on embracing this new approach and the steps that universities could take to better support their awareness and acceptance on the new trend. Project Alpha is an initiative program designed to elevate student's creativity by sharing their artworks into multiple platforms such as Augmented Reality, Metaverse platform, or NFT Marketplace. This research seeks to explore the impact of digital disruption among students, specifically focusing on creative arts student at Higher Learning Institution. By applying in-depth interviews, thematic analysis will be implemented and analysed to uncover deeper understanding of creative arts students' readiness and observations through a focus group to embrace new technologies for their artistic processes. The results of this study will provide valuable insights for educational institutions, creative arts students, and the art community regarding the effective incorporation and utilization of digitalised mediums to nurture creativity and expand opportunities for artistic success in the digital art industry.

Keywords: Digital artworks; Creative students; Augmented Reality (AR); New technologies; Innovation

I-CReST 2023:319-287 - Unravelling Reading Difficulties: An Investigation of Pre-University Students' Use of Strategies for Navigating Online Materials

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ABSTRACT

Reading is a key component for successful language acquisition and academic success. The transition from secondary school education to foundation level requires utilisation of more effective strategies in navigating online reading materials to fulfil more demanding academic tasks. For this, pre-university students must drive themselves as independent learners and become proficient readers. This study aims to investigate difficulties in reading online texts in English and the strategies used by pre-university students to improve comprehension. A quantitative method utilising an online 5 Likert-scale survey, adapted from Abeeleh and Al-Sobh (2021) and Amer, AL Barwani, and Ibrahim (2010), was used in this study. The questionnaire consists of 5 sections and a total of 48 items. A purposive sampling method was used to extract data from a sample of 207 participants from a Centre of Foundation Studies in Malaysia. The data was analysed using SPSS (Statistical Package for the Social Sciences) version 29. Findings revealed that students' reading difficulties are varied in nature; ranging from their sense of inferiority, poor language proficiency, feelings of frustrations with reading disabilities and anxiety that have cumulatively impaired their comprehension. Their use of the global, problem-solving, and support strategies is significantly associated with reading difficulties. Meanwhile, correlation analyses were done to determine the relationships between reading difficulties and use of strategies. Irrespective of the complexity of online materials, pre-university students have employed a combination of strategies regarded as effective in coping with reading difficulties. This is interesting as it seems to suggest that the current language courses might have played a role. The study has highlighted several key aspects that can be taken into consideration in designing language instructions for pre-university students to increase their awareness and use of reading strategies that are effective for the enhancement of reading ability, language development and overall academic achievement.

Keywords: Pre-university students; Reading difficulties; Reading strategies; Online reading materials; Global strategies; Problem-solution strategies; Support strategies

I-CReST 2023:320-288 - A Systematic Review of Experiential Learning Methodologies in Tourism and Hospitality Management Education

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ABSTRACT

In the realm of tourism and hospitality management education, experiential learning has long been recognized as an effective methodology. However, with the advent of the Fourth Industrial Revolution (IR 4.0), the education landscape is undergoing transformation, impacting the implementation of experiential learning methods due to technological influences. This review study aims to identify the types of experiential learning methods used in teaching and learning for hospitality and tourism management education. The PRISMA Framework was employed as the foundation for the selection criteria, resulting in the inclusion of 18 articles in this review study. The findings reveal seven types of experiential learning methods employed in the reviewed studies: service-learning projects, restaurant/labs, field trips, internship programs, role play, apprenticeship, and simulations. Among these, service-learning projects were the most mentioned method, with six studies highlighting its usage. The restaurant/laboratory approach emerged as the second most frequently employed experiential learning method, followed by field trips as the third most prevalent approach. Internship programs were mentioned in two studies, ranking as the fourth experiential learning method. Role play, apprenticeship, and simulations were each mentioned in only one study. In conclusion, incorporating experiential learning in the classroom holds great potential for enhancing learning outcomes, allowing students to apply their knowledge and skills in real-world situations. However, it is important to consider that different experiential learning methods may be more suitable for specific courses. Future research should focus on effective planning, design, and integration of experiential learning content to support optimal learning in hospitality and tourism management education.

Keywords: Service-learning; Experiential learning projects; Restaurant; Field trips; Role-playing

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