CREATIONS de UiTM

INTERNATIONAL MEGA INNOVATION CARNIVAL 2024

Navigating Innovation and Seizing Global Fortune

CHANGE THE WORLD THROUGH INNOVATION

ABSTRACT BOOK

27th APRIL 2024

UNIVERSITI TEKNOLOGI MARA
CAWANGAN SELANGOR, KAMPUS DENGKIL
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CREATIONS de UiTM: INTERNATIONAL MEGA INNOVATION CARNIVAL 2024

ABSTRACT BOOK

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PROGRAM OVERVIEW

CREATIONS de UiTM: INTERNATIONAL MEGA INNOVATION CARNIVAL 2024 (CDU2024) is inspired by UiTM2025 Strategic Plan, which outlines the university's transformation to become a leading global university of science, technology, humanities, and entrepreneurship by 2025. Innovation development is crucial to acquiring knowledge, information, know-how, and technology, for providing opportunities for both the institution and the country to achieve national development agenda. The implementation and diffusion of new ideas and talents, as well as their continuous evolution, are critical in making innovation a major catalyst that can propel Malaysia five years ahead towards the status of a developed and high-income country.

This year, the Centre of Foundation Studies at UiTM Selangor Kampus Dengkil is once again hosting an international innovation initiative themed "NAVIGATING INNOVATION AND SEIZING GLOBAL FORTUNE" through the CREATIONS de UiTM: INTERNATIONAL MEGA INNOVATION CARNIVAL 2024 (CDU2024). Aligned with the current theme, the CDU2024 program, conducted in a hybrid format, seeks to unveil how technology and its applications are integrated into our lives. The CDU2024 program, is designed to highlight creative talents and innovative mindset across different segments of society throughout the country. It welcomes participation from university students and innovators, both nationally and internationally, allowing them to showcase their experiences and exposure in different fields while creating innovative products that are not only appealing but also beneficial to the community. It keeps countries and innovators relevant, competitive, and adaptive, which also strengthens the culture of innovation among innovators, as well-nurtured and optimized culture of innovation plays a pivotal role in successful innovation.

CATEGORY A
(Professional)

Phonetics Word Search: Phonetics Quest

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ABSTRACT

Improving English pronunciation in university-level education demands fresh and creative strategies, considering the vital role clear pronunciation plays in global communication. Non-native English learners face hurdles due to limited exposure to authentic English-speaking environments. Recognizing this challenge, there is a growing acknowledgment for more captivating and independent learning methods to enhance comprehension and spoken English proficiency. Phonetics Words Search: Phonetics Quest was crafted to make language learning enjoyable. This novel approach aims to turn language learning into an entertaining game, offering an exciting avenue for UiTM Foundation students to refine their pronunciation skills. This innovation not only focuses on recognizing phonetic patterns but also emphasizes their practical application in real-world language contexts. Phonetics Quest, a variation of traditional word searches, replaces puzzle letters with phonetic symbols. Each page includes a topic-related word list, such as foods or animals, with a hidden block of phonetic letters revealing the spellings. These spellings can appear in various directions, adding complexity with intentional misspellings aimed at deceiving participants. The difficulty levels are categorized according to the Common European Framework of Reference (CEFR) levels. By assessing university students' attitudes toward Phonetics Quest, valuable insights are gained into the effectiveness of this innovative teaching strategy. These findings contribute to ongoing discussions on optimizing language education, showcasing the adaptability of Phonetics Quest as a valuable tool for language educators at the university level.

Keywords: pronunciation; phonetics; word search; CEFR

Human Immunity Battle Board Game

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ABSTRACT

The traditional approach of teaching human immunity in Biology has run into problems where students find it difficult to understand the topic due to inadequate use of instructional materials and poor study habits. Therefore, a board game called Human Immunity Battle is created to help students master the topic. The main purpose of this study is to improve students' understanding as well as increase their interest in learning biology. The innovative instructional immunity in human board games embraces the principles of gamification by infusing fun and challenge into learning. The human immunity battle board game involves the scientific concepts of human immunology, recognizing the different levels of competencies among students to make complicated biological concepts easier to understand. An adaptive gameplay is included in the game ranging from basic to complex concepts, hence, promoting engagement and deeper understanding among players. The concept aims to boost students' engagement and understanding through gamification whereby its interactive nature encourages active participation, fostering greater interest in the subject and addressing limitations of traditional teaching. This approach extends beyond the board game itself. The game's framework can inspire educational software to enhance motivation across various academic fields. Teachers can adapt its rules for versatile subject teaching, making it a valuable pedagogical tool. In summary, the Human Immunity Battle Board Game has the power to completely transform how students learn. Its creative approach, which simplifies complex topics and encourages active engagement, solves the drawbacks of conventional teaching techniques in the topic immunity in human.

K**eywords:** biology; board game; instructional

Efficient Visible-Light-Active of Ag_2CO_3/Nb_2O_5 photocatalyst for EDCs removal in wastewater

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ABSTRACT

Photocatalysis has become more attractive and important since it has a great potential in solving environmental problems. One of the most important aspects of environmental photocatalysis is the selection of photo-active materials. Ag-based semiconductor materials are currently catching the interest and research efforts of numerous material researchers due to their wide range of applications especially photocatalyst for waste-water treatment. Silver carbonates (Ag_2CO_3) is a common p-type semiconductor with a moderate band gap of 2.30 eV has also caught interest for its high-performance photocatalytic performance and anti-bacterial properties. To further improve the separation of photo-induced charge carriers, Ag_2CO_3 was employed to couple with niobium pentoxide (Nb_2O_5) can greatly accelerate the charge separation. In this work, hybrid Ag_2CO_3/Nb_2O_5 composite as a photo-active material was successfully prepared by a facile chemical precipitation method. The photocatalytic activities of the hybrid samples were evaluated by monitoring the photodegradation of bisphenol A (BPA) under visible light irradiation. The hybrid Ag_2CO_3/Nb_2O_5 composite sample exhibited promising results in the photocatalysis process with BPA removal of 79.09 % and showed good stability and reusability that can be used up to 4^{th} cycle. The enhanced performance of hybrid Ag_2CO_3/Nb_2O_5 photocatalyst shows that it has potential for designing the dye waste-water treatment.

Keywords: Ag_2CO_3; Nb_2O_5; photocatalysis; visible; waste-water

Limit Navigator: Mathematical Maneuvers

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ABSTRACT

The concept of limits, poses a significant challenge for many students due to its abstract nature and complex manipulations. Traditional methods of teaching limits often fail to engage students effectively, resulting in poor comprehension. Many learners struggle to grasp the abstract concepts and mathematical manipulations involved, leading to disinterest in limit's concept. Therefore, this innovation aims to revolutionize calculus education by providing a comprehensive and interactive platform for learning limits. Mathematical limits are explored through a dynamic navigation system to enhance student comprehension and mastery of limit concepts through dynamic visualizations, guided exercises, and personalized learning experiences. Our product focuses on a real life mathematical approach to understanding limits of functions. This product is crafted utilizing a combination of strong telescopic magnets, transparent clear tubing, a sturdy box, and a wire netting frame. The product guides learners through a series of mathematical manoeuvres, allowing them to navigate through various limit problems with confidence and ease. By providing an intuitive and interactive platform, this innovation has the potential to revolutionize the way limits are taught and learned, ultimately improving outcomes for students worldwide. The commercial potential of this innovation is substantial, with opportunities for widespread adoption in educational institutions and tutoring services. Ultimately, a strong grasp of limits enhances students' ability to tackle more advanced topics in calculus and related fields, paving the way for success in higher education and beyond.

Keywords: limits; mathematical manipulations; calculus; dynamic visualizations

Bike - Hoe

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ABSTRACT

Agriculture tools are devices which useful in farm practices to assist farmers in various tasks related to cultivation, planting, harvesting and other agricultural activities. This Bike-Hoe main function is to lose the soil for gardening and watering the plant. It was fabricated with some improvements from the existing equipment in term of function. This innovation consists of a bicycle frame with a wheel and a blade or tines attached to the frame. The previous version of Wheel Hoe is required large physical effort to push and manoeuvre. The farmer must bend over from the waist to reach the ground. The objective of this project is to design and fabricate loosen soil equipment with additional function which less effort needed during the loosen soil process for gardening using waste materials. Some fabrication process has been made like designing, measuring, cutting, welding, joining, and installing process. This Bike – Hoe successfully fabricated and function well. Therefore, it can help gardeners and farmers to work more efficiently and effectively in their fields, resulting in healthier crops and greater yields as well as has commercial potential for future.

Keywords: bike; hoe; loosen; soil; agricultural

NanoFresh M+: Silver Nanoparticles Formulated Shoe Spray

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ABSTRACT

The pervasive issue of smelly shoes remains a common challenge affecting individuals globally. Footwear, particularly in closed and moist environments, becomes a breeding ground for odor-causing bacteria, leading to unpleasant malodors. Social discomfort associated with smelly shoes necessitates an innovative and effective approach to tackle this issue. In this study, NanoFresh M+, a novel shoe spray that utilizes silver nanoparticles (AgNPs) synthesized from senduduk leaves (*Melastoma malabathricum*) was formulated aiming to address the enduring issue of malodorous footwear through advanced and sustainable technologies. The method begins with the collection of senduduk leaves and the preparation of a methanolic extract. Subsequently, the biological or green synthesis of AgNPs was performed, accompanied by their characterizations. Following this, the synthesized AgNPs undergo the antibacterial test, and finally, the shoe spray was formulated. In this study, we have successfully developed a novel shoe spray utilizing AgNPs from senduduk leaves extract which exhibit antibacterial properties. AgNPs are tiny particles with unique properties that make them valuable in various applications. The green synthesis of AgNPs using senduduk leaves extract is an eco-friendly, cost-effective, and sustainable approach to nanotechnology. This innovative method harnesses the natural properties of senduduk leaves extract to reduce and stabilize silver ions, facilitating the formation of AgNPs without the need for harsh chemicals. Overall, NanoFresh M+ is an innovative shoe spray with antibacterial properties that meet the practical need for odor control in footwear which holds significant commercialization potential as an effective and marketable product to combat malodors.

Keywords: AgNPs; antimicrobial; green synthesis; *Melastoma malabathricum*; silver nanoparticle

Effects of Bu_3MeNTf_2N Ionic Liquid Addition on Conductivity of PVC- NH_4Tf Polymer Electrolytes

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ABSTRACT

Solid polymer electrolytes (SPEs) with poly (vinyl) chloride (PVC) doped with a fixed amount of ammonium trifluoro methane sulfonate (NH_4Tf) and with varying concentrations of ionic liquid butyltrimethyl ammonium bis (trifluoromethyl sulfonyl) imide (Bu_3MeNTf_2N) were synthesised via solution cast technique. PVC-NH_4Tf- Bu_3MeNTf_2N-based SPEs with 15 weight % Bu_3MeNTf_2N exhibit conductivity of 1.56×10^{-4} Scm^{-1} at room temperature. The ionic conductivity is attributed to the dissociation of NH_4Tf facilitated by Bu_3MeNTf_2N. Results of XRD indicate that the most amorphous film has the highest conductivity and this is corroborated by the results of DSC. FTIR spectra revealed that Bu_3MeNTf_2N has weak interaction suggesting that it acts mainly as a lubricant to facilitate polymer segmental motion.

Keywords: polymer electrolytes; ionic liquid; ionic conductivity; XRD; infra-red spectroscopy

Development of An Automatic Barrier Prototype for An Urban Flooding Early Warning System

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ABSTRACT

This project focuses on developing a prototype for an automatic barrier system as a crucial part of an urban flooding early warning system. Urban areas face increasing flood risks due to climate change and urbanization, necessitating robust early warning mechanisms. The study's primary goal is to design and implement an automatic barrier system to mitigate flood-related risks. The methodology involves integrating various sensors, data processing, and automated control mechanisms to detect rising water levels and deploy protective barriers. The successful development of the prototype, incorporating IoT integration, involved coding for components like RGB LED, servo motor, LCD I2C, water level sensor, ultrasonic sensor, and buzzer using Arduino IDE. Additionally, an IoT monitoring system via a Telegram bot was integrated, allowing users to command an ESP32 camera to capture and view images instantly. The system also includes a flood level indicator and risk warning mechanism, with the ultrasonic sensor measuring water levels and displaying them on an LCD I2C screen. In emergencies, a buzzer sounds, and the RGB LED turns red to alert residents. This project demonstrates the successful creation of a functional prototype capable of real-time response to flooding events, enhancing urban resilience and safety. In conclusion, it underscores the importance of proactive flood management and the potential of automatic barriers in flood risk reduction and early warning systems.

Keywords: LCD (Liquid Crystal Display); RGB (Red, Green, Blue); LED (Light Emitting Diode)

iTrackah - An Innovative Solution for Accurate Tracking of Raka'ah During Muslim Prayers

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ABSTRACT

In Islamic tradition, the accurate performance of prayer rituals, particularly the tracking of raka'ah, holds immense significance. Yet, practitioners often encounter challenges in maintaining focus during prayer, resulting in errors in counting raka'ah. Furthermore, individuals with visual impairments or those new to prayer face additional hurdles in accurately tracking the raka'ah. Existing manual counting methods or reliance on memory are prone to error and may detract from the spiritual experience. Thus, there is a pressing need for technology-driven solutions to offer accurate and accessible means of tracing raka'ah. A preliminary survey conducted for iTrackah, a novel device designed to address this need, revealed a significant demand and acceptance for such a product. Initial feedback indicates that iTrackah holds promising potential to alleviate the common challenge faced by Muslims worldwide. iTrackah is a device that leverages sensor technology to accurately monitor prostrations and translate them into the corresponding number of raka'ah completed. The device is designed to cater to the diverse needs of the Muslim community, including those with disabilities or those granted rukhsah. For users eligible for rukhsah, iTrackah intelligently recognizes the subtleties of prayer gestures to accurately determine the number of raka'ah performed. Moreover, iTrackah offers features to assist users in case of forgetting the number of raka'ah during prayers, ensuring a seamless and uninterrupted prayer experience. With its user-friendly interfaces and optional reminders, iTrackah emerges as an innovative solution poised to transform the way Muslims engage in prayer, guaranteeing precision, inclusivity, and peace of mind in worship.

Keywords: iTrackah; raka'ah tracking; Muslim prayers; movement sensors; solat assistance

Football Training Module for University Student Under-19

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ABSTRACT

Football is one of the most popular team sports in the world that involve kicking a ball to score a goal by eleven player per team. This sport is played by various age level and university student (collage) is one of the footballer age levels, but the main problem is they are facing with busy schedule, specifically to manage their academy and football playing time. Addressing the challenge of busy schedules for university students involving in football requires a flexible and efficient training approach. To enhance players' development, it is important for coaches to create a module that utilize a variety of training strategies and methods. Therefore, this football training module is designed based on S.E.T. strategy that aims to provide a holistic approach to develop young university footballers without neglecting their academic work. This module consists of systematics schedule training activities focusing not only on technical and tactical aspects but also on physical fitness, mental resilience, and teamwork. In addition, small-sided games, and game-based scenarios (game simulation), enable U19 get the opportunities to develop every aspect of football game play and match fitness. By utilizing this football training module in their drill, out of seven participations on competitive match and friendly, 5 won (71.4% winning percentage) and 2 drew (28.6%) is achieved. Ultimately, by following this structured module, university students under U19 players can enhance their skills and knowledge of the football game, preparing them for success both on and off the field without neglecting their academy achievements.

Keywords: football; university U19; busy schedule; training module; S.E.T.

Elevating Students' Paraphrasing Skills Through Paraphrases Matrix and ChatGPT

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ABSTRACT

Integrating artificial intelligence (AI), notably ChatGPT, into academic settings poses opportunities and challenges for students' writing and critical-thinking skills. This study explores the implications of incorporating ChatGPT into English language paraphrasing activities to enhance students' language proficiency and analytical reasoning while addressing concerns about AI's impact on education. Through the development of a Paraphrases Matrix and meticulous crafting of paraphrasing activity worksheets, undergraduate students engaged in structured activities aimed at improving their paraphrasing skills and understanding of AI's capabilities and ethical implications. The study involved five groups of undergraduate students enrolled in an Academic Writing Skills course who underwent sequential paraphrasing stages and reflections on their experiences. Results indicate initial errors but significant improvement in students' paraphrasing abilities and awareness of ChatGPT's utility and limitations. This project offers valuable insights into responsible AI integration in education, emphasizing critical thinking and independent writing skills essential for navigating an AI-dominated future.

Keywords: academic writing; artificial intelligence (AI); ChatGPT; English language; paraphrasing activity; research writing

LANGUAGE CROSSOVER

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ABSTRACT

Green's (1998) Inhibitory Control (IC) Model posits that bilingualism and inhibition form the basis, with lexical items from both languages activated concurrently according to a bilingual's experiences. This means all a bilingual's languages activate when speaking or thinking, and inhibition suppresses the unused language. Because of this, previous studies have suggested that bilingualism may improve a person's cognitive control capacity—that is, their ability to use monitoring and inhibition to maintain focus on the task at hand while filtering out irrelevant information. Some studies, however, were unable to replicate the results because they neglected to account for the linguistic background of the participants. Therefore, the goal of the current product, Language Crossover, is to help bilinguals improve their ability to inhibit in order to help them improve their cognitive control. Language Crossover, a mobile app, is a mobile game that applies two languages (i.e., Malay and English). In this game, players will need to inhibit one language over the other by choosing the correct falling targeted words into a basket. In order to track participants' individual mental response speeds, a reaction time will be recorded. A needs analysis questionnaire was given to 200 participants in order to explore the potential of this game, and 85% of them agreed that the Language Crossover game is an engaging game that aids in the practice of their Malay and English language proficiency. In addition to academic uses, this mobile app has commercial potential in the domains of cognition and bilingualism.

Keywords: bilingualism; cognitive control capacity; Inhibitory Control Model; mobile app

Treatment of Microplastics via Electrocoagulation

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ABSTRACT

Plastic materials have been employed in various applications, such as for clothing microfibers, microbeads, and plastic pellets. Moreover, this substance has been used to make bottles, fishing nets, plastic bags, microwave containers, tea bags, and many more appliances. However, towards the end of the product's life, plastics are hard to dispose of and take longer time to degrade. Plastics can be fragmented into smaller pieces into microplastics with a size of 5.0 mm. This substance persists at high environmental levels and is detected in the water environment, particularly in aquatic and marine habitats. Thus, it is necessary to reduce this pollutant and enhance water quality. The electrocoagulation innovation has been introduced to treat these pollutants in the water sample. The water sample was taken from the Tampoi River beside Universiti Teknologi MARA, Cawangan Dengkil. The sample was taken into the laboratory and treated by the electrocoagulation process. The results before and after treatment have been evaluated, and a significant reduction of microplastics has been detected. The electrocoagulation process enables to reduce the microplastic pollutants and can be a long-term solution for sustainable green technology in the water industry.

Keywords: electrocoagulation; microplastics, plastics waste; treatment

What a Day! Compact Edition

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ABSTRACT

In learning English, learners are expected to acquire four different skills namely: listening, speaking, reading, and writing where speaking is considered the most crucial skill to acquire among the four skills. However, most second language learners often perceive speaking as the toughest skill to master mainly because English is not their native language. They struggle to speak in English due to a lack of confidence in using the language. As a result, they eventually lose interest and become unmotivated during speaking lessons. Hence, with the current innovation, “What a Day! Compact Edition” is an engaging and collaborative card game developed to assist second-language learners in building their confidence to speak in English. It promotes a positive and supportive learning environment that encourages students to actively participate in English conversations which can help to improve their speaking abilities. By fostering active engagement during speaking lessons, it helps to enhance learners’ communication skills. The uniqueness of the card game lies in its adaptability and versatility as it can be tailored to different competency levels in different settings. Therefore, "What a Day! Compact Edition" holds significant marketability and commercialization potential due to its unique approach to enhancing English communication skills. This time, with a more compact and user-friendly design, the packaging box makes it easy to store, transport, and use wherever players go. This convenient portability ensures that learners can engage in constructive learning experiences and acquire the skill to speak confidently using English anytime, anywhere.

Keywords: card game; speaking skills; supportive environment; communicative ability; collaborative game

EPROS 3.0

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ABSTRACT

Malaysia is known as a multilingual country. Despite the many races in Malaysia (e.g., Malay, Chinese and Indian), English language is used as the medium for professional matters such as in the job prospect and education. However, many individuals face challenges in acquiring and honing this skill due to various reasons such as lack of access to quality resources, limited practice opportunities, and fear of making mistakes especially in the English speaking skills. EPROS 3.0, the improved version of EPROS 2.0, aims to address these challenges by providing a comprehension solution in enhancing Malaysians English speaking skills. Sustaining the original concept of EPROS, EPROS 3.0 still consists of 7 booths that will cover 7 components of English speaking skills which are inhibition, nothing to say, low participation, mother tongue use, vocabulary, pronunciation and grammar. Nevertheless, EPROS 3.0 will provide a motivational kit for its participants. This motivational kit will be observed by licensed counsellors to improve the participants' motivation to speak in English language. The idea behind this kit is based on a need analysis done which shows that more than 70% of the participants agreed that they lack motivation when it comes to speaking in English language. Due to its authentic mission, EPROS 3.0 has the commercial potential to incorporate with NGOs and educational institutions. Hence, it is hoped that this program can be a catalyst in improving Malaysians' speaking skills.

Keywords: English speaking proficiency; EPROS 3.0; ESL learners

Trigo-Tricks (TT): Enhancing Mathematics Learning Via Online Games

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ABSTRACT

Gamification in Mathematics is an interactive pedagogy that can be used to increase students' interests. In learning mathematical concepts such as Trigonometric topics, more interactive activities and engagement platforms are proposed to help the students' understanding in Mathematics. Students are now exposed to the new era of technology-based education, which is frequently employed to create an environment that may facilitate mathematical problem solving. Therefore, an online game called Trigo-Tricks (TT) was created so that students could play it and concurrently work through the games' questions. The aim of this study is to examine the students' interest in learning Trigonometric topics which are found to be difficult for them to understand using Trigo-Tricks (TT). This Trigo-Tricks (TT) is designed using buildbox platform and it is integrated with trigonometric concepts and calculations. A sample of 45 sciences students in the Centre for Foundation Studies, International Islamic University Malaysia (CFS IIUM) will be selected for this pilot study using purposive sampling technique. Overall, the findings support that gamification in mathematics will lead to a better learning environment and are suitable to be used as educational tools. Students are more likely to explore new learning methods in understanding subject matter compared to traditional methods. For commercialization, this game can be introduced and utilized by all institutions which offer pre-university programme. The game is practical, and it is easy to be accessed by students. As a conclusion, Trigo-Tricks (TT) provides an advantage for students such as increasing the students' interest and understanding in learning Mathematics.

Keywords: gamification in Mathematics; students' interest; pre-university programme; interactive learning

Halal Aquaculture Feed Standard

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ABSTRACT

Animal feed is regarded as one of the Critical Control Points in animal production. This is due to the fact that non-halal feeding practices may affect the Halal and tayyib status of animals fed with non-halal and filthy feed. Repeated episodes of improper feeding practices in aquaculture production reported in the media and the gazette of the Fatwa that prohibits the feeding of cultivated fish with non-halal feed, as well as the non-availability of a specific standard for halal animal feed production in the country has created the necessity for the establishment of a halal standard for feed to ensure halal and tayyib food supply chain from farm to fork. This standard on halal animal feed was therefore developed based on analysis and examination of national and international animal feed and halal-related standards. Hence, this is the first research that proposes a standard for Halal aquaculture feed preparation, production, storage, and distribution. This proposed standard could be used as a reference for Standard Malaysia and Halal certification authority in Malaysia for the development of a Halal standard for aquaculture feed production at the national level. Given the fact that a halal standard for animal feed has not been issued by JAKIM, and there are critical demands and necessities among the feed industries and farmers, this proposed halal feed standard shall contribute to the improvement in the production of safer and halal aquaculture feed in Malaysia.

Keywords: halal animal feed; aquaculture feed; halal feed standard

Let's Learn English through Arabic Using the English Translation of the Qur'an

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ABSTRACT

An ideal way to learn English grammar is through the context of the English language itself. However, in practice, low proficiency learners, particularly Malaysian students from Islamic educational backgrounds, often face challenges in learning English grammar within its context. One of the reasons is due to their inability to identify similarities between English and other languages they know, such as Arabic. English and Arabic are distinct languages; however, they share several grammatical aspects. Therefore, a module entitled "Let's Learn English through Arabic Using the English Translation of the Qur'an" was developed to address this challenge. The module was designed to encourage students to use their prior knowledge of Arabic grammar to learn English grammar. This was achieved by highlighting shared grammatical aspects such as nouns, pronouns, adjectives, and tenses. To demonstrate how the rules work in sentences, the module incorporates English translations of selected Qur'anic verses. Additionally, Arabic structures found in the Qur'an were utilised to ensure familiarity with the highlighted Arabic grammatical aspects. By including Arabic words within the module, students were able to better grasp English grammar concepts. Moreover, Islamic elements were incorporated in the module that align with the student's field of study and emphasise the relevance of English proficiency in Islamic Studies. Beyond the benefits for the targeted students, this module holds significant commercial potential in broader educational markets. Its innovative approach also presents a valuable resource for diverse audiences who seek effective language instruction.

Keywords: English learning module; English grammar; Arabic grammar; Qur'an; translation

Islamic Adab Courseware 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 a few states in Malaysia. For KAFA Classes, there are eight to nine subjects taught in class for year 1 to year 6 students. Since its presence, all subjects have been taught using traditional methods (in class through a face-to-face method by using textbooks and activity books). During the pandemic of Covid-19, teachers are facing difficulties in teaching online as there are very minimal sources of teaching materials. Hence, this study is conducted in response to the issue. For this study, the focus has been set for year 2 students that taking Islamic Adab subjects in Sekolah Kebangsaan Tembak, Kedah. The main objective of 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 requirements. The preliminary findings have been mapped to Universal Design Learning (UDL) which focuses on three main theory components which are engagement, representation, and action and expressions. From there, the ADDIE model was applied in the development process. The phases involved in the development process are analysis, design, development, implementation, and evaluation. To complete the testing phase, the courseware then undergoes functionality and usability testing. Findings from the testing results indicate that the courseware developed meets all requirements set at the early planning stage and is suitable to be used in teaching Islamic Adab for year 2 students.

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

Learning Arabic Through Virtual Classroom (LAVC) For Year Six Students

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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 and secondary schools. In observation, teaching Arabic language can be challenging as there is a lack of online sources related to Arabic language that is based on syllabus taught in Malaysia schools. Hence, this study is conducted in response to the issue. Through this study, a virtual classroom (LAVC) is proposed aimed at addressing the challenges faced by year 6 students in Sekolah Kebangsaan Dato' Yahya Subban, Perak as the focus group. LAVC is a platform that consists of teaching materials, activities, assessments, and others. LAVC is developed using the Universal Design for Learning (UDL) theory and the Adapted System Development Life Cycle (SDLC) method. UDL has been chosen as it is 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

'TikTok Star' Project

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ABSTRACT

In response to Malaysia's globalisation initiatives, effective communication using different languages attracts foreign collaborations. In the context of foreign language teaching and learning, learners' reluctance to speak due to the fear of making mistakes and receiving criticism is a typical issue. Moreover, learners encounter difficulties to practice the target language because of environmental constraints that retard them to speak in public. 'TikTok Star' project is an innovative formative assessment approach that incorporates the trending social media platform with classroom instruction. This project aims to provide opportunities to foreign language learners to practice speaking on a wider platform, improve learners' speaking skills and confidence, and enrich social network between learners, community, and professionals that encourage meaningful conversation and future collaboration. This project was conducted with a group of foreign language learners (n=33). Feedback was collected through qualitative surveys. Learners feel competitive and accountable to perform themselves to the community that indirectly improves their technological literacy, creativity, knowledge, and skills. This project has the potential to replace conventional formative assessment, which normally include excessive of data tracking. It improves the quality of formative assessment by gathering rich and constructive comments from professionals and the community on the social media platform. Incorporating TikTok in language teaching and learning tends to expand collaboration globally, helping learners across Malaysia to improve their foreign language speaking skills. Despite being a free platform, TikTok as performant and extensive comment gathering tool can also help with profit or nonprofit projects, including aiding the development of language learning hubs.

Keywords: collaboration; formative assessment; foreign language; speaking; TikTok

MOREBAC: More-Beautiful-Adds-Confident

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ABSTRACT

As we know, today's teenagers are very concerned about facial skin care. Most of them have problems with dry skin and oily skin which can be said to be caused by several factors. Among the factors that affect this problem are weather factors and age factors. This problem can also be linked to the use of facial cleansers that do not suit the skin. Our innovation, "MOREBAC (More – Beautiful – Adds – Confident)" helps teenagers with skin problems. This product is said to be two in one because it can be used as a cleanser and can be used as a make-up remover. The objective of this innovation is to increase self-confidence, and make the skin look more beautiful and healthier for teenagers. Moreover, it is able to deal with skin problems and is able to make teenagers self-confident in daily life. MOREBAC products are believed to be made from natural ingredients that have many advantages for treating skin cells. We hope the innovation of MOREBAC can go further and better and provide many benefits, especially for those responsible for skin health. The use of a spray bottle that is different from others, can be widely marketed because of the uniqueness of the design. Perfect in a smaller container and easy to carry and not easy to spill.

Keywords: facial skin care; skin problems; cleanser; make-up remover

Biology Exploding Stratified Epithelial Set (BESET)

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ABSTRACT

Studies around the world have discussed a lot about the difficulties faced by students in learning topics in biology. In biology, cell organisation is often regarded as challenging and uninteresting topics because it requires memorization, including different types and functions of cells such as stratified cells. Biology Exploding Stratified Epithelial Set (BESET) aims to increase interest and comprehension in cell organisations topics. It is designed to help STEM students understand and memorize stratified cell types in a fun and appealing way. It also intends to provide alternative and hands-on teaching and learning aid for students of biology. BESET consists of 5 layers of multiple size hexagonal boxes folded and stacked on top of each other. Each layer will represent one type of this stratified cell type complete with interactive information such as the types, characteristics, location, and functions of the specific stratified cells. BESET provides an exciting and interactive ways in learning cell organisations as compared to traditional pen and paper method. Based on the survey questions given to UPNM students, the result showed BESET gives benefits in understanding the topics easily as well as memorization. 75% of respondent strongly agreed that BESET is fun and exciting, while 81% strongly agreed that BESET's design is interesting and easily comprehensible. Therefore, BESET is suitable for matriculation/foundation students to enhance their understandings. As an innovative STEM teaching and learning aid, it can be commercialized to be applied by educators at matriculation/foundation level institution both at national and global level.

Keywords: biology; cell organization; epithelium; stratified; learning aid

Biology Exploding Epithelial Set (BEES) – Simple Epithelial Tissues

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ABSTRACT

Learning Biology involves the memorization of various concepts, including epithelial tissues. Simple epithelium consists of a single layer of cells in direct contact with the basement membrane and can be classified into different types such as simple squamous, simple cuboidal, simple columnar, and pseudostratified. Understanding these tissue types may be challenging due to their variety, functions, and locations within the body. To address this challenge, a tool called BEES has been developed specifically for STEM students to aid in learning about different types of simple epithelial tissues in an interactive manner. BEES comprises multiple layers that correspond to specific types of epithelial tissue and contain relevant information about each type. Students using BEES can gradually uncover each layer while engaging with accompanying notes and questions to reinforce their understanding. Feedback from student surveys indicates that using BEES helps improve comprehension and memory retention on this topic more effectively compared to traditional methods. This innovative educational tool aims to revolutionize biology education by providing an alternative hands-on approach for accelerated learning. BEES, the educational tool specifically designed for STEM students, provides an interactive and innovative approach to learning about different types of simple epithelial tissues.

Keywords: biology**;** epithelial tissue; educational tools; STEM

Tangible Triad: Grasping 3-Dimentional Vector

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ABSTRACT

A vector in a plane is a directed line segment that can be represented by a line drawn to a known scale. Vector representation is based on Cartesian coordinate system in 2D or 3D. This topic cover in subject MAT093 for UiTM Foundation Engineering and Sciences students in semester 1. From the beginning, student should be able to understand the concept of Cartesian coordinate system. After that they can go to another steps in learning vectors. The main problem is student lack of understanding to imagine the location of point in Cartesian coordinate system. It is beneficial to start learning vectors with full understanding about location of points in Cartesian coordinate system. Tangible Triad is an innovation created to assist students grasp the concept of Cartesian coordinate system. Student will be able to see, touch, and experience the Cartesian coordinate system during learning session. Tangible Triad will beneficial to teachers and students since it includes practical exercises that will help students grasp the material better and develop an engaging approach to learning vectors.

Keywords: 3D vector; cartesian coordinate system; position vector; learning kit

Arabic On-The-Go Kit for Beginners

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ABSTRACT

The open and distance learning (ODL) approach is becoming more often, whereby educators have to adapt and change their traditional teaching method that is mainly based on textbook, whiteboard and presentation slides. However, the lack of open educational resources (OER) for Arabic language at tertiary level poses a problem. Therefore, lecturers need to develop an innovative digital teaching and learning aid for Arabic. Hence, this study aims to introduce and identify the effectiveness of Arabic On-The-Go Kit for Beginners with the concept of Watch, Play, Practice! as a digital teaching aid that simulates textbook conversations and promotes game-based learning. It features a YouTube playlist that consists a series of creative videos with links to online games and quizzes. It was distributed to students in Universiti Teknologi MARA (UiTM) and their feedback was collected through a survey. It was found that the kit enhances their engagement and learning experience, and improving their listening and speaking skills. In addition, it has commercial potential as revenue can be earned when the YouTube channel is eligible for monetization. In summary, this creative digital teaching aid is significant in providing educators and learners with an immersive and enjoyable teaching and learning experience that facilitates open and distance learning session.

Keywords: Arabic teaching aid; YouTube video; open and distance learning (ODL); artificial intelligence (AI); game-based learning

IoT-Powered Door Entry System: NodeMCU ESP 8266 and HiveMQ Integration

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ABSTRACT

Ensuring the security of one's residence or property is paramount, demanding meticulous attention to safeguard both the premises and its assets. Contemporary insights underscore the susceptibility of conventional physical key door locks to damage and unauthorized access. Such vulnerabilities arise from the risk of misplaced keys and unauthorized duplication, obliging individuals to consistently carry physical keys. This study introduces an innovative Internet of Things (IoT)-enabled smart door access system tailored to fortify the security of homes and premises. Offering keyless access to authorized individuals, the system integrates a NodeMCU ESP 8266 microcontroller to manage door operations. Access control is streamlined through the Virtuino IoT application, enabling smartphone-based door unlocking. Furthermore, the system employs a MQTT broker, notably the HiveMQ, to facilitate seamless machine-to-machine communication among IoT components. This IoT-centric approach addresses the shortcomings of traditional key-based systems, mitigating risks associated with damage and unauthorized replication. By rendering traditional keys obsolete, the proposed system enhances security while enhancing user convenience. Rigorous development, testing, and operationalization have culminated in a highly robust and effective system, consistently achieving a 100% success rate across all functions. Practical implementation within the Centre of Excellence for Cybersecurity (CoExCys) office at Kuliyyah of ICT IIUM demonstrated seamless operation without encountering operational challenges throughout a week-long trial period. These findings underscore the system's potential as a viable solution for bolstering security and access management across diverse environments.

Keywords: smart door; HiveMQ; ESP 8266; Virtuino IoT; CoExCys

Advancing Journalistic Excellence: Elevating News Quality Standards Across Media Platforms for Multimedia Journalists

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ABSTRACT

As newsrooms transition towards convergence and cross-media operations, there arises a pressing concern regarding the preservation of journalistic standards. For broadcast media organizations, embracing this model becomes crucial not only to uphold news quality across diverse platforms but also to foster enhanced journalistic practices among Multimedia Journalists (MJs). It necessitates adapting to evolving determinants of news value, including immediacy and multimedia integration, marking a fundamental shift in news conception, production, and dissemination. Failure to adapt risks loss of relevance and audience, diminishing organizational impact in the public sphere. Five research objectives were pursued: i) Identifying elements crucial for developing news quality standards on cross-media platforms as perceived by MJs ii) Understanding challenges in maintaining news quality on cross-media platforms from the perspective of MJs iii) Investigating transformations in MJs' practices affecting cross-media platforms iv) Exploring collaboration between news management and MJs on cross-media platforms to enhance journalistic practices v) Proposing strategies for newsroom management to overcome obstacles faced by MJs on cross-media platforms in delivering high-quality journalism. Insights from interviews with 30 MJs and news editors highlight the fusion of ethical journalism with engaging digital storytelling. MJs balance speed with rigorous fact-checking, viewing their work as a social responsibility. Emphasized are collaboration, strategic newsroom changes, and supportive HR practices. Media organizations must evolve to stay relevant, while MJs require skills to navigate digital news. This model aims to assist MJs and media organizations in producing high-quality, newsworthy content, potentially integrating into journalism school curricula.

Keywords: multimedia journalist; news quality; cross-media platform; journalistic practices

Smart Shopping Trolley with Automated Billing Using Arduino

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ABSTRACT

This innovative Arduino-based billing system addresses the pervasive issue of long queues at shopping malls and supermarkets during item billing, where customers often spend a minimum of 10 minutes per transaction based on purchase quantity. The system's real-time automation, triggered by customers scanning items in their carts, instantly updates the total cost, generates electronic invoices, and virtually eliminates human errors by retrieving item details and prices from a continually updated database. This solution significantly enhances efficiency, accuracy, and customer satisfaction by streamlining the checkout process, saving time, and reducing errors. Ultimately, it aims to empower customers, alleviate overcrowding, and revolutionize the shopping experience in retail establishments of all sizes. Billing using Arduino typically involves integrating Arduino microcontroller boards with sensors, input devices, and display components to create a cost-effective and customizable billing system. Arduino collects input from sensors, such as RFID readers processes the data, and displays the billing information on an attached screen or sends it to a database for record-keeping. By utilizing Arduino's flexibility and affordability, developers can design tailored billing solutions for different purposes, offering a wide range of functionalities and customization options.

Keywords: Arduino; smart trolley; automation; real-time; billing

Model Kelestarian Dana Wakaf Melalui Instrumen *Istibdal* di Malaysia

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ABSTRAK

Dalam usaha ke arah melestari pembangunan harta wakaf di Malaysia, pihak pentadbir wakaf khususnya Majlis Agama Islam Negeri (MAIN) menghadapi masalah kekangan dana yang serius untuk menguruskan harta wakaf. Dengan jumlah harta wakaf yang banyak di seluruh Malaysia serta kos perbelanjaan yang tinggi bagi melaksanakan pembangunan menyebabkan hanya sedikit sahaja harta wakaf dapat dibangunkan. Selain masalah kekurangan dana tunai, pihak pentadbir wakaf juga menghadapi masalah kekurangan strategi untuk membangunkan harta wakaf yang sedia ada. Masalah ini menyebabkan harta-harta wakaf tidak dapat dimanfaatkan kepada masyarakat Islam secara maksimum selaras dengan objektifnya. Justeru, objektif penubuhan model inovasi ini adalah bagi mewujudkan kelestarian dana wakaf yang komprehensif melalui kaedah *istibdal*. Dengan wujudnya model inovasi ini, pihak Majlis Agama Islam dapat memanfaatkannya bagi menjana dana tunai sekaligus dapat membangunkan harta-harta wakaf yang sedia ada di Malaysia sekaligus memenuhi salah satu daripada agenda kerajaan persekutuan dalam Rancangan Pelan Induk Wakaf Nasional iaitu 'Penjanaan Dana daripada Aset Wakaf' di bawah Rancangan Malaysia Ke-12.

Keywords: harta wakaf; *istibdal*; lestari; dana wakaf

Fact Finding Booklet V.II I Am Malaysian: A Constitutional Perspective

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ABSTRACT

The Malaysian Constitution, the supreme law of the land, designates the Yang di-Pertuan Agong as the Head of State and delineates the three main branches of government: the executive, led by the Prime Minister and Cabinet Ministers; the judiciary, overseen by the Federal Court; and the bicameral legislative branch, comprising the Dewan Rakyat and Dewan Negara within Parliament. The constitution protects basic human rights like personal liberty and religious freedom. It's crucial to comprehend this supreme law for public acceptance. Regrettably, the student's grasp of the Constitution remains limited. Therefore, the primary aim of this project is to transform Malaysia's Constitution into an engaging gaming booklet, providing innovative avenues for learning. "The game, inspired by the popular children's game Humpty Dumpty, features three levels challenging players' understanding of their rights as citizens under the nation's highest law. This innovative approach utilizes a doctrinal method, a legal technique, for conducting research. The objective is to raise awareness among Malaysians and deepen their understanding of constitutional matters. Both academic environments and the wider community stand to benefit from the marketing potential of this product".

Keywords: constitution; supreme law of the land; understanding law; gaming booklet

A Framework for the Development of Trigon-hexa Magic Journey (ThMJ)

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ABSTRACT

Mathematical education is a crucial endeavor focused on creating effective learning experiences for students. Within this realm, the concept of active learning emerges as a promising approach, transforming students from passive recipients into proactive learners. This study explores the transformative potential of integrating active learning principles with the Trigon-hexa Magic Journey (ThMJ) board game, which combines mathematics and adventure. The ThMJ board game offers an immersive fusion of mathematics and adventure, encouraging students to engage with trigonometry concepts through tactile interaction and strategic gameplay. Drawing from the theoretical framework of active learning, this study investigates the real-world applications of trigonometric functions and aims to provide students with an enjoyable way to solve trigonometric challenges. The development of ThMJ involves careful attention to game board layout, player materials, and trigonometry challenges, ensuring an engaging and educational experience for students. By integrating active learning principles with the Trigon-hexa Magic Journey board game, this study seeks to transform the traditional approach to mathematics education and inspire students to become active participants in their own learning. The benefits of ThMJ are clear. It makes learning trigonometry enjoyable, helps students see the real-world relevance of math, and boosts their problem-solving skills. In addition, it fosters teamwork and builds confidence – all while having a blast. In conclusion, ThMJ isn't just a game – it's a game-changer for math education. By making learning interactive and fun, it has the power to inspire a new generation of math enthusiasts.

Keywords: Trigon-hexa magic journey; mathematics boardgame; trigonometry knowledge; problem-solving skills

Micro HaWT (Horizontal axis Wind Turbine) for Teaching and Learning in Green Power Technology

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ABSTRACT

Green technology is becoming more significant as the availability of fossil fuels decreases. Agreement among researchers indicates that wind energy is the prevailing source of renewable energy. Wind energy is considered climate-neutral because it releases a lower amount of greenhouse gases. Several studies have assessed the potential of wind power generated by wind turbines at different locations, but only a limited number have found ideal wind conditions. An appropriate microturbine installation is essential for ecological energy education. Therefore, the primary objective of the Micro HaWT (Horizontal axis Wind Turbine) prototype is to enhance the comprehension of wind turbine energy production. Furthermore, practical demonstrations of renewable technology research can be carried out without any detrimental impact on the exhaust air system. This prototype has been specifically developed with dimensions that are appropriate for research purposes, and it utilizes an artificial wind source where outdoor air conditioning systems are a feasible option for using wind energy. Moreover, their current contribution to energy generation offers indirect benefits, particularly in metropolitan areas.

Keywords: green technology; wind energy; microturbine; horizontal axis wind turbine; outdoor air conditioning systems

Compact Hyd_VaBT (Hydro Vertical axis Blade Turbine)

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ABSTRACT

To develop sustainable alternatives to conventional energy production methods, the importance of renewable energy sources is increasing. Hydropower is a renewable energy source that harnesses the kinetic energy of moving water to generate electricity. In many cases, small-scale hydropower facilities are more feasible and cost-effective than large-scale ones. Hydro turbines are not extensively utilized in Malaysia for the generation of power. Therefore, a compact hydro turbine can be utilized to provide electricity for communication devices or electrical appliances. Hence, this study aims to create a compact hydro turbine power generator employing vertical axis turbine blades that may be applied in many locations, including distant regions. This will be achieved by making efficient use of various production processes, such as machining, sheet metal fabrication, joining techniques, and other mechanical method. With a maximum power of 2 kW, the intended result of providing electricity and facilitating the user's daily tasks using renewable energy was achieved.

Keywords: hydropower; compact hydro turbine; vertical axis turbine blade; renewable energy; electricity

Halal Risks Flashcards BITAQAT

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ABSTRACT

Currently, JAKIM as the halal competent authority has legislated that halal certificate holder companies shall conduct trainings such as halal awareness training and competency training for their staff/worker. Some issues arise regarding to the training, and capability of worker to comprehend the course contents. Ineffective training will cause halal compliance will not achieve the requirements. Halal Risks Flashcards are basically on the risks that are potential in halal management. The data is collected through library research on academic papers from sources such as ScienceDirect, Google Scholar and ResearchGate. The data then analysed by using qualitative approach which is content analysis. Based on studies, it is found that risks in halal management can be categorized into three (3): Contamination risks, Certification risks, and Macro-level risks/External risks. Halal Risks Flashcards BITAQAT introduces handy way of understanding risks within halal management. This will ensure continuity of knowledge dissemination in both academic and industry alike. The product also hoped to revolutionize the learning experience in Halal discipline.

Keywords: halal flashcards; halal risk; risk management; training

i-ACE© Model In Engaging The Teaching And Learning Activities For Construction Management Master Project Course (PHASE 1)

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ABSTRACT

The construction sector faces complex challenges that demand innovative solutions. Collaboration among industry, academia, and the community is increasingly essential to address these challenges effectively and efficiently. This engagement enables the exchange of knowledge, resources, innovation, and best practices, resulting in improved problem-solving approaches and sustainable outcomes in construction. Hence, to foster innovation, ideas, knowledge, funding, and resources through a symbiotic relationship among all stakeholders in the construction industry, the Industry-Academia-Community Engagement (i-ACE©) model has been developed. This model has been integrated into the two-semester Master Project course of the Master of Construction Management program, aims to enhance advanced knowledge, research and development, economic growth, and societal problem-solving. Using a quantitative research approach, a designed online questionnaire survey was administered to 13 respondents which has been completed the master project course. All respondents were engineers or project managers, with two owning construction companies. Survey findings indicate that active engagement between industry, academia, and the community, particularly in knowledge transfer and community-driven projects, enhances the effectiveness of the teaching and learning for master project course. Respondents agreed that these engagement activities provided practical insights and skills relevant to construction management, contributing to finding optimal solutions for community well-being. In conclusion, the successful implementation of the i-ACE© model in the teaching and learning process in master project course demonstrates its effectiveness in fostering symbiotic engagement among industry, academia, and the community. The i-ACE© model offers numerous benefits to stakeholders, including innovation and knowledge exchange leading to the development of new ideas, products, and services. It also enhances networking opportunities among construction industry players and provides solutions to pressing social issues such as sustainability, health, and social inclusion.

Keywords: i-ACE©; quantitative research, teaching and learning; construction management

Preliminary Study on Pineapple (*Ananas comosus*) and Ginger (*Zingiber officinale*) Juices Effect on Phlegm Reduction

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ABSTRACT

Phlegm, or thick mucus, is produced by a chesty cough, and the body can create mucus and phlegm for a variety of causes. Short-term irritation or pain from phlegm and coughing may be experienced, but these conditions usually do not pose a major threat and can usually be treated permanently. On the other hand, if mistreated over an extended period, there may be a higher chance of developing chronic illness. A mixture of pineapple (*Ananas comosus*) and ginger (*Zingiber officinale*) juices has piqued our interest in our study as home remedies or over-the-counter (OTC) medications can help relieve coughing symptoms. The Malaysian locals claimed that the juices could reduce phlegm, but this has never been reported scientifically. The earlier methodology used was to prove phytochemical properties to determine active compound presented in both fruit using simple extraction. The preliminary study's outcome on juices of pineapple (*Ananas comosus*) and ginger (*Zingiber officinale*) tested on five (5) males of an average of 65 kg and five (5) females with an average of 50 kg student of Asasi STEM in a 1:3 (mL) ratio has been demonstrated to reduce phlegm by 50–75% when taken three times a day for a minimum of five (5) days. This project has won Best unique project and won gold for individual project in PIITRAM@2024. We believe that the juices can be commercialize for its properties and sold as a medicinal cum beverage to the communities.

Keywords: *Zingiber officinale*; *Ananas comosus*; cough; phlegm

Enhancing Pre-lab Learning: A Virtual Journey of Mouse Dissection (VMD)

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ABSTRACT

The effectiveness of pre-lab preparation significantly impacts science students' comprehension and engagement during practical sessions. A mouse dissection experiment is quite costly and should be done correctly to avoid wastage of specimens. To address the challenges, we introduce an innovative solution: a virtual dissection video tailored specifically to augment students' understanding of mouse anatomy before hands-on laboratory sessions. A study was conducted on 60 pre-university students shows that 65% strongly agree, 28.3% agree that it is important to have a visual understanding of mouse anatomy before engaging in a hands-on laboratory dissection activity. While a total of 88.3% students would recommend the use of virtual dissection videos tool to their peers or instructors. Our video guides students through a detailed exploration of the mouse's internal structures and physiological systems, identifying major organs and their functions. The virtual experience allows students to pause, rewind, and interact with the at their own pace, promoting deeper understanding and retention of key concepts. The video will not only benefit Foundation students, but also A level and school students. Future plan will integrate 3D diagram, quizzes and assessments which further promote active learning and self-assessment.

Keywords: virtual learning; mouse dissection; pre-lab video; science students

SafeRide: A Mobile Application to Remind Parents of Their Kids in the Car

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ABSTRACT

Islamic law emphasizes parents' responsibility to care for and nurture children, known as "hadhanah," encompassing their safety and well-being. However, instances of parental negligence endanger children's lives, such as incidents of heatstroke from being left in cars. In Malaysia, statistics reveal alarming rates of child neglect, with many cases involving fatalities due to parental negligence. These tragedies highlight the urgent need for effective solutions to prevent child deaths in vehicles. SafeRide addresses this pressing issue with its pioneering mobile app, utilizing advanced technology to ensure child safety during car journeys. Through features like smart sensors, geo-fencing, and customizable alerts, SafeRide empowers parents to safeguard their children aged 1-5 years old. Furthermore, the app offers educational resources and integrates with emergency contacts for added support. The commercial potential of SafeRide lies in subscription models, partnerships with automotive and insurance industries, and international expansion. By prioritizing convenience, performance, and affordability, SafeRide aims to revolutionize child safety technology, fulfilling the Islamic principle of hadhanah and protecting children from harm.

Keywords: mobile application; Islamic; technology; safety

Conquering Mount KK: An Inference Game 2.0

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ABSTRACT

Reading is considered one of the important skills in language learning since it is generally defined as the process of recognition and comprehension of written materials. It is a complex process since reading requires integrating some cognitive processes, skills and knowledge to construct meaning from a reading material and interpret the information. Inference skill is one of the most important predictors of reading comprehension that can assist language learners in their reading. Unfortunately, ESL learners in Malaysia generally struggle to make good inferences in reading hence make it difficult for them to concentrate on the task itself, to understand important content vocabulary, meaning of phrases, sentences as well as paragraphs when answering MUET reading comprehension paper. Hence, *Conquering Mount KK: An Inference Game Version 2.0* is invented to assist ESL learners to practice their inferencing skills in a fun and exciting way and most importantly to improve learners' inferential skills that can help them in scoring MUET reading comprehension paper. With additional set of cards specifically designed similar to the inference questions in MUET, *Conquering Mount KK: An Inference Game Version 2.0* aims to help ESL learners in Malaysia to ace their reading paper and MUET in general.

Keywords: making inferences; reading skills; interactive game; MUET; reading comprehension

Human Milk's Polyamine: A Potential Advancement as Biomarker

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ABSTRACT

Polyamine composition in human milk comprises putrescine, spermidine, and spermine, each playing distinct roles in infant development and digestive health. Variation in composition occurs across lactation stages and influenced by factors like maternal dietary intake. Imbalanced diets may hinder infant growth, weaken immunity, and heighten infection risks. This cross-sectional observational study analyzed 30 human milk samples from Melaka, Seremban, Selangor, and Kuala Lumpur using High-Performance Liquid Chromatography (HPLC) to quantify polyamine content. Maternal diets were recorded in Nutritionist Pro software, with macronutrient intake calculated automatically. Statistical analysis using SPSS assessed the association between maternal diet and polyamine composition. Carbohydrates were the most consumed macronutrient (59.1%, M = 214.42 g), followed by fat (22.8%, M = 37.36 g) and protein (18.1%, M = 63.40 g). Among polyamines, spermine showed the highest concentration (70.2%, M = 5.4 nmol/L, SD = 5.99), followed by putrescine (22.3%, M = 1.74 nmol/L, SD = 3.38) and spermidine (7.4%, M = 0.58 nmol/L, SD = 0.88). No significant difference was found between maternal dietary intake and polyamine composition. However, a negative correlation existed between polyamine levels and certain macronutrients such as lipids, suggesting involvement in other metabolic processes. This study indicates that while dietary intake may not directly influence polyamine levels in human milk, polyamines may interact with specific nutrients in maternal diets, impacting their metabolism. It also indicates a potential of human milk's biomarkers in many breastfed infants' metabolic disease.

Keywords: polyamine; human milk; maternal dietary intake

Cuboid Nasi Lemak: A Novel Approach to Enhance Consumption Control and Promote Culinary Innovation

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ABSTRACT

Nasi lemak, a quintessential Malaysian dish, enjoys widespread popularity as a breakfast staple and light dinner option. Despite its esteemed status, concerns regarding its potential health implications, notably its association with diabetes and obesity, have spurred extensive research endeavours. Innovations, including the substitution of traditional coconut milk with soy milk, have been explored to elucidate their effects on health parameters. However, the exploration of innovative packaging solutions aimed at controlling consumption rates and catering to commercial interests remains relatively unexplored. In response, this study sets out to introduce a novel form of nasi lemak: the cuboid. This innovative approach offers consumers three distinct choices of sambal and side dishes, while concurrently assessing the calorie and nutrient content of each cube. Furthermore, the project endeavours to evaluate the cost-effectiveness of preparation. The uniqueness of this approach lies in its potential to attract new customers, bolster local food marketing initiatives on a global scale, foster creativity and innovation within the culinary sphere, and unlock new business opportunities while enhancing the international appeal of rice-based cuisine. By merging culinary tradition with contemporary ingenuity, the cuboid nasi lemak represents a promising avenue for reinvigorating the culinary landscape and advancing global gastronomic discourse.

Keywords: nasi lemak; cuboid; innovative approach; business opportunities

Motorcycle Accessories Detection and Helmet Detection

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ABSTRACT

We have built two object detection models called motorcycle accessory detection and helmet detection. The motorcycle accessory detection model is used to detect accessories that exist on motorcycles, while the helmet detection model is used to detect whether motorcyclists are wearing helmets or not. Today, the number of vehicles on the road has drastically increased, making it difficult for governments to control vehicle users. Hiring more enforcement officers would be costly, and hiring humans to do enforcement work also has disadvantages as humans cannot consistently perform well at work all the time. The materials used to build this model include a laptop, pre-trained YOLOv5 model, dataset (videos), data labelling software, and a Python code editor. Firstly, we split the dataset and labelled it. After that, we loaded the dataset into the YOLOv5 model, then set its parameters and trained the model. For uniqueness, if an organization replaces humans with this model, it can reduce operational costs and potentially achieve better results because this model can work more consistently than humans. This model has the potential to be applied in the vehicle industry, such as PUSPAKOM. Additionally, this model can be trained to detect parts of cars and lorries and can be used for JPJ operations. Lastly, AI is a new technology that can change how people work. AI is cheaper than humans, so it can be used to perform human jobs.

Keywords: YOLOv5; vehicle industry; object detection models

Capturing The Attention of Non-Engineering Students to Study Engineering Subject

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ABSTRACT

Teaching engineering subject to non-engineering student is almost impossible and hard to deal with. In the early days, it is a taboo for non-engineering student to take engineering subject in their course. and vice versa. The perception is that the student's will not able to understand the subject thus leading to obtaining bad results or maybe fail in the subject. However, the exposure of students learning subject that are not in their major programme will bring an added value to them. The students will have some knowledge on something that is not in their major programme. In this real-life scenario, a student in Faculty of Hotel and Tourism have to take an engineering course called Civil Engineering Materials (CES425) in their programme. There were two batch of students from the Hotel Faculty that have to undergo this course and they are PHM240 and PHM245. Both of the programme addressing different type of students. Students in PHM245 were trained to be Chef whereas PHM240 students were trained to be a hotel manager. The same syllabus of CES425 is used for engineering students. This study is to share about the method used by the lecture on how to attract the non-engineering students to study an engineering subject. A total of 102 students as the samples has been analysed and it showed that the achievement of the non-engineering students is almost at par with engineering students.

Keywords: Civil Engineering Materials; non-engineering students; creative method; hotel students

CATEGORY B
(Postgraduate/Undergraduate)

Refluent: A Collection of Sampling Techniques related Cartoons a Collection of Sampling Techniques

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ABSTRACT

The traditional lecture is still one of the most common teaching methods since it has the advantage of being able to reach many students in one time slot. One of the main contributors to student boredom is the use of PowerPoint. The lecturers tend to prepare too many slides, pack them with too much information, and whizz through them in a manner that obliges students to spend most of the session attempting to copy amounts of text from the screen. Interactivity allows students to have an active role in the learning experience. Thus, our group has introduce an innovative learning materials embedded with cartoon illustration, for research methodology course and sampling topic known as Refluent. The purpose of sampling is to obtain a sample that reflects the population in terms of variables that are the focus of the researcher. Therefore, a good sample selection is a sample that can represent the variable in question from the target population. There are two types of sampling procedures: 1) probability sampling, and 2) non-probability sampling. Complex sampling categories make it difficult for students to understand the appropriate sampling method for their study. Most students like to choose a simple random sampling technique without realising that this technique is not easy, and most students fail to explain the purpose of the technique during the viva presentation or in the thesis report. Therefore, this creative note is expected to help students and lecturers to facilitate teaching and learning about sampling techniques.

Keywords: cartoons; interactive; sampling technique; research

Web-based Digital Games for Cognitive Improvement of Preschool Children

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ABSTRACT

Cognitive development in preschool children, encompassing skills like memory, problem-solving, and attention span, plays a pivotal role in shaping their future learning capabilities. Recognizing that interactive multimedia can enhance cognitive abilities, KiddoCog is a cutting-edge online resource designed for young children between the ages of 3 to 5. KiddoCog provides a customised and interesting learning experience by fusing age-appropriate game design with adaptable machine learning techniques. The software creates informative reports for parents and educators in addition to monitoring and assessing cognitive progress. KiddoCog is an innovative approach to early childhood education that uses technology to provide a safe and morally-responsible digital environment that supports cognitive development in the formative years.

Keywords: digital games; preschool children; cognitive

Development of Pelletized Surfactant-Modified Clinoptilolite for Congo Red Adsorption

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ABSTRACT

The presence of dyes as contaminants in water resources may affect water quality leading to mutagenic and carcinogenic effects, potentially infecting humans and animals. Congo red present have a significant environmental impact. The adsorption process is one of the approaches for Congo red removal that could match all our demands for environmental friendliness and optimal efficiency. The current research aims to develop pelletized surfactant-modified clinoptilolite with high adsorption ability as a raw material and assess its effectiveness as a novel material for Congo red adsorption. By modified the charges using solvent with a specific ratio will be studied extensively to enhance the attachment between Congo red and modified clinoptilolite. Clinoptilolite's surface properties can be tailored by modifying it with Cetyltrimethylammonium-Bromide (CTAB). This modification improves adsorption effectiveness and capacity while also changing charges, allowing them to attract more dyes with varying characteristics. However, using adsorbents in the form of tiny particles remains challenging, and their application in continuous systems is limited due to the cracking and pressure loss they cause. The impact of pelletizing surfactant-modified clinoptilolite must be an effective strategy for addressing the drawbacks of powder materials in wastewater treatment plants. Using pelletized surfactant-modified clinoptilolite avoids the need for post-filtration, simplifies maintenance and regeneration, and preserves post-production equipment and valves, leading to decreased maintenance costs and no adsorbent loss or wash-off.

Keywords: adsorption; modified-clinoptilolite; Congo red; pellets; surfactant

An Innovative Approach to ANN Classification Techniques for L-Band Absorption Performance in Biomass Microwave Absorbers

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ABSTRACT

This project introduces a novel approach to microwave absorber technology tailored for biomass applications. The rapid proliferation of Industry 4.0, notably the extensive adoption of 5G communication systems, has underscored concerns regarding the health effects of radiation. Addressing this concern necessitates highly effective anti-microwave materials, particularly in telecommunication systems integral to daily life. However, prevailing classification techniques employing Artificial Neural Networks (ANN) encounter challenges related to accuracy, efficiency, and adaptability, while conventional methods often overlook intricate material-microwave interactions, resulting in suboptimal absorber designs and resource inefficiency. The objective of this study is to provide a novel method for using ANN classification techniques to effectively estimate and predict the absorption performance of biomass microwave absorbers in the L-Band frequency range. By employing computer-aided design (CAD) software and simulation tools, absorber designs will undergo prototyping and refinement before to actual manufacture. Laboratory investigations will confirm the absorption properties within the L-Band frequency range, while durability tests will assess the long-term stability and robustness under various environmental circumstances. The findings highlight the effectiveness of the unique Artificial Neural Network (ANN) classification method in improving absorber designs for biomass applications. This strategy utilizes environmentally acceptable materials to promote sustainability. From a commercial perspective, the combination of competitive pricing and strategic alliances ensures a strong market position as a high-quality yet reasonably priced product. This is achieved by stressing performance, sustainability, and innovative features.

Keywords: biomass microwave absorber; artificial neural network; l-band; absorption performance; classification technique

Innovative Pyramidal Microwave Absorber: Eco-friendly Utilization of Biomass and Silicon Carbide for Enhanced EMI Reduction

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ABSTRACT

This study presents an innovative approach to developing pyramidal microwave absorbers, addressing environmental concerns associated with conventional polymer materials. The research focuses on integrating silicon carbide, a ceramic material, into the absorber's composition to enhance performance and align with sustainable practices. The absorber is constructed using a blend of cement, water, carbon, aluminium powder, and silicon carbide, showcasing attributes such as heightened fire resistance, super-thermal properties, workability, and environmental friendliness. A comprehensive analysis of the absorber's characteristics is conducted through an array of tests, including resistivity tests using multimeters, dielectric measurements employing vector network analysers (VNA) and high-temperature coaxial-line dielectric probes, as well as reflectivity performance assessments through the NRL free space method. The empirical data culminates in a graph illustrating reflectivity versus frequency, revealing a significant enhancement in absorber performance with the incorporation of 10% silicon carbide, compared to the absence of this compound especially at S-band and X-band. The study also advocates for eco-conscious practices, emphasizing the use of locally sourced biomass materials, particularly in Malaysia's biomass sector. In conclusion, the carbon-ceramic pyramidal microwave absorber emerges as a promising solution for commercial applications, offering efficiency, sustainability, and environmental compatibility in communication technology and electromagnetic interference reduction in anechoic chambers.

Keywords: microwave; absorber; anechoic chamber; biomass; ceramic

IoT-Based Reverse Vending Machine (RVM) with Rewards

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ABSTRACT

The "IoT-Based Reverse Vending Machine (RVM) with Rewards" project introduces an innovative approach to address crucial challenges in waste management and environmental sustainability. By integrating Internet of Things (IoT) technology with the traditional concept of vending machines, this initiative redefines recycling as an interactive, convenient, and rewarding experience. The primary objective of this project is to encourage proactive participation in waste reduction by enabling users to easily deposit recyclable items such as plastic bottles and aluminium cans, while establishing a direct connection between individual actions and global environmental impact. The effectiveness of the IoT-based RVM lies in its integration of advanced sensors and user-friendly interfaces, simplifying recycling processes and enforcing the idea that environmental responsibility can be accessible and enjoyable. What sets this project apart is the implementation of a rewards system, leveraging human behavior and motivation. Beside rewards, the project promises data-driven insights through IoT connectivity, encompassing deposited item types, quantities, user preferences, and recycling trends. Accessible via a user-friendly app interface, this data offers comprehensive insights into consumption patterns and recycling behaviors, benefiting individuals, recycling companies, environmental organizations, and policymakers alike. In essence, the "IoT-based Reverse Vending Machine (RVM) with Rewards" project embodies innovation, sustainability, and collaborative action, paving the way for a cultural shift towards responsible consumption and environmental stewardship. This initiative exemplifies how technology can drive meaningful change, one recycled item at a time.

Keywords: IoT; reverse vending machine; recycling; rewards; blynk

Li-Al-NiF_2 Composite as a Potential Material for Solid State Hydrogen Storage

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ABSTRACT

Employing a catalyst alongside ball milling demonstrates a significant reduction in the decomposition temperature and a notable enhancement in the desorption kinetics of $LiAlH_4$. This study explores the possibility of adding NiF_2 to $LiAlH_4$ complex hydride to improve its hydrogen storage capacity. Temperature-programmed desorption analysis indicates a reduction in the onset desorption temperature and an improvement in kinetic performance with the introduction of NiF_2 to the LiAlH4 system compared to its undoped counterpart. These results suggest that the NiF_2 component in the $LiAlH_4$ system could play a catalytic role through the formation of active species during the heating process, improving the hydrogen desorption properties of $LiAlH_4$. This research highlights the potential of metal halide catalysts, particularly NiF_2, in elevating the performance of hydrogen storage materials like $LiAlH_4$, making it an innovative way for advancing sustainable energy solutions.

Keywords: lithium aluminium hydride; solid-state; hydrogen storage; dehydrogenation properties

Free-Lac Straw: For People who Lactose Intolerance

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ABSTRACT

Lactose intolerance is a health issue marked by symptoms like diarrhoea, vomiting and bloating caused by the body's inability to digest lactose. This happens due to lack of enzyme lactase, which functions to breaks down lactose. Lactose intolerance is common in Asia, especially in Malaysia, where the prevalence is 87%. Comparatively, in America, the prevalence is around 50%. Individuals with lactose intolerance will avoid consuming milk and this may increase risk of osteoporosis and bone fracture. High prevalence of lactose intolerance among Asian has brought attention to this issue within our society. Therefore, research is necessary to devise innovative approaches aimed at eliminating this problem in the future. The objective of this innovative project is to provide solution to eliminate the problem faced by lactose intolerance individuals in the world. This project utilizes DNA aptamers by incorporating them onto the surface of beads to act as capturing agents. These beads will be integrated into a biodegradable straw. When the straw is used to drink lactose-containing beverage like milk, it filters out lactose molecules, resulting in lactose-free drinks. The success of this project can be measured by comparing the quantity of lactose molecules in milk before and after using this innovative straw. In summary, this will provide an alternative solution to assist individuals, particularly those with lactose intolerance, to have milk in their daily diet as recommended by the Ministry of Health. Consequently, they can derive health benefits from consuming milk nutrients, leading to a healthier body throughout the life course.

Keywords: lactose intolerance; aptamer; bead; lactose; biodegradable straw

Desainku Application as an Effort to Improve the Quality of Fashion Industry Design in the 5.0 Era

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ABSTRACT

Fashion is becoming a lucrative industry in Indonesia as its growth rate continues to increase. According to Consumer News and Business Channel (CNBC) Indonesia, in 2019, the development of the fashion industry can contribute around 18.15% or IDR 116 trillion. The development of the fashion business, the large and medium segment of the apparel industry, recorded the highest production growth among other sectors during the first quarter of 2019. According to the Central Statistics Agency (BPS) Indonesia, in the first 3 months of this year, the apparel industry's production grew by 29.19% on an annual basis. Fashion entrepreneurs still lack skills in understanding fashion design, but they need a lot of adequate understanding and knowledge, so as to help high creativity also in creating fashion designs and fashion production for Indonesian fashion entrepreneurs, both beginners and experienced ones. Andy, 2013). Based on this problem the researchers made the Desainku Application. This research use ADDIE method. This application also has a business feasibility analysis. Desainku is an Android-based application built with Android Studio software that can be customized with material modules, learning videos, and design consulting. As a result, the Desainku application scored 4.4 in the very good category based on three tests. As a result, it can be concluded that the Desainku application is appropriate for use as part of an effort to improve the quality of fashion design industries to realize the 2030 Sustainable Development Goals with 4-point Quality Industrial specifications.

Keywords: applications; sustainable development goals; fashion design right

STROBO (Stroke Board) as Rehabilitation Media for Wrist Joint in Post-Stroke Patients

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ABSTRACT

Stroke is a disease that causes disability in the world and is the third cause of death in the world. Worldwide, every year 13.7 new cases of stroke and about 5.5 million deaths due to stroke. Stroke is a permanent nerve disorder due to disruption of blood circulation to the brain that occurs suddenly, progressively, and quickly which can cause damage to the brain and cause long pain for people who suffer from it, namely paralysis, so that they experience limitations in their daily activities. STROBO (Stroke Board) is an economical wooden board to rehabilitate the wrist joint in stroke patients, STROBO (Stroke Board) contains a set of therapies on the wrist joint with sensory exercises in the form of rough and smooth, strengthening the muscles of the wrist joint through resistance bands and training the coordination of the patient's fingers. The goal is to assist rehabilitation and economical means of access to therapy in one board so as to improve daily activities in patients. The method of this research is using RND (Research and Development) by creating a new idea and testing the effectiveness of existing products and developing and creating new products. Departing from the literature review, this tool has a high success rate and is effective in rehabilitating wrist joints in stroke patients. In general, this idea offers the right solution for stroke patients with an economical therapy tool with several therapeutic goals so that it can support patient health.

Keywords: stroke; therapy tool; rehabilitation; stroke board

Street Art Bukit Bintang by e-Scooter: Application of Fuzzy-AHP & GIS

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ABSTRACT

Cities are grappling with safety concerns surrounding e-scooters, leading to bans in some areas. However, there is a need to understand the best paths for e-scooter users, especially when main roads are unavailable or restricted. Decision-making methods like MCDA and GIS network analysis can help determine the best routes, considering various criteria and outcomes. This study aims to determine the best street art trail for e-scooters through the combined use of Fuzzy-AHP (FAHP) and GIS The objectives include identifying optimal pathway criteria, mapping potential trails using GIS, and assessing differences from other route planner applications. FAHP used to compute the criterion weights and these weights were integrated with GIS to establish a network model and identify the optimal e-scooter pathway using the TSP method. The final output is a map detailing optimal e-scooter route connecting street art in Bukit Bintang, featuring path information, street art locations, nearest train stations, and e-scooter rental stations. Following the derivation of the optimal path, analysis involved comparing it with existing trails from other navigation apps were made.

Keywords: e-scooter; fuzzy-AHP; GIS; network analysis; travelling salesman problem

Site Suitability Modeller Tool for Electric Vehicle Charging Stations by using the Integration of Hexagonal Fuzzy-AHP and GIS

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ABSTRACT

In this rapidly evolving landscape of urban mobility, a strategic deployment of Electric Vehicle Charging Stations (EVCS) holds key in the creation of sustainable transportation systems especially in the era of escalating demand towards the changes to an environmental sustainability. In fact, the uneven distribution of the existing EVCS causes several challenges such as range anxiety for users. These challenges require a strong approach in identifying suitable site. However, current practice shows limitation such as it may be prone to human errors. To address this, an automation tools are created, presenting an innovation methodology integrating Hexagonal Fuzzy Analytical Hierarchical Process (AHP) with GIS to conduct the site suitability modelling of EVCS. This approach involves five (5) stages considering criteria like Perceived Safety, Accessibility, Public Facilities, and Population Density, based on Malaysian EVCS development standards. Spatial data representing the criteria need to be collected to establish nine (9) criterion maps through data editing, rasterization, and reclassification processes. Weightage of each criteria were determined by using the pairwise-comparison matrix obtained from industrial and academician experts, followed by weighted overlay analysis to identify the suitable sites. However, this process can be tedious and lengthy which brings to the main objective of this study is to develop an automation GIS tool for site suitability modelling by leveraging specified criteria and weights provided by the experts. Ultimately, this tool aims to help in identifying suitable EVCS location with a single button thereby accelerating the deployment of EVCS and supporting sustainable urban transportation.

Keywords: EVCS; site suitability; hexagonal fuzzy-AHP; GIS; GIS automated tools

Cycle Tour Path using the Integration of Fuzzy-AHP and ELECTRE in GIS Network Analysis

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ABSTRACT

Cycle tourism can have many positive effects on the local economy, including good effects on the environment and the nature preserve, as well as the ability to spread good behaviours and habits. The method addresses the challenges and opportunities in cycling infrastructure and tourism. It aims to determine the criteria for safe cycling paths, identify potential cycle tour paths using Fuzzy-AHP and GIS methods, and analyse the suitability of these paths through the ELECTRE method. The objectives of this method are to determine the degree of importance for factors influencing the design of cycling paths, to derive potential paths for cycling tour and to analyse the suitability of potential paths for cycling tours. This method is intended to integrate Fuzzy-AHP and ELECTRE techniques within a GIS network analysis framework. The method's findings reveal a systematic methodology integrating Fuzzy-AHP, Traveling Salesman Problem (TSP), and ELECTRE methods within GIS which facilitating the identification of the most suitable cycle paths for tourism purposes. This approach offers a visual representation of optimized paths and enhancing sustainable cycle tourism while promoting economic and environmental benefits for the local community. In conclusion, this method highlights the importance of integrating advanced methodologies such as Fuzzy-AHP, TSP, and ELECTRE within GIS for identifying optimal cycle tour paths. By implement these techniques, it can enhance cycle tourism experiences and offer valuable insights for policymakers and stakeholders seeking to develop and promote sustainable tourism initiatives centred around cycling.

Keywords: cycle tourism; ELECTRE; fuzzy-AHP; GIS; TSP

Characteristics of Solid Soap Made from Waste Cooking Oil with Variation in Purification Temperature

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ABSTRACT

The use of Wasted Cooking Oil (WCO) continuously could damage the human health and if the waste did not managed properly, it has the potential to pollute the environment marked by increased levels of Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) which causing a foul odor due to biological degradation. Activated charcoal could absorb gases or odors and colors contained in WCO to improve its quality. The purpose of this study is to determine the characteristics of solid soaps made from different purifying level of WCO's temperature. This research used completely randomized design (CRD) with four levels temperature i.e. 70, 80, 90, 100°C. Observe parameters include pH, texture, foam content, and sensory tests. Data analysis was conducted using ANOVA and followed by Duncan test if significance ($P<0.05$). The best solid soap characteristic was produced by 100°C treatment of temperature and it creates a solid soap with texture 38,19±1,84, pH 9,32±0,03, foam content 13,29 ±0,02, and it gets score 6,15 from 7 from panelist in the sensory tests. Even though this solid soap is made from WCO, it has passed SNI 3532:2021 about solid soap standard that states the pH of solid soap must be between 9 and 11.

Keywords: wasted cooking oil; temperature level; solid soap

Kenang Ara Hydrogel: Alternative Wound Treatment from Cananga and Aloe Vera Extract as The Implementation of Local Potential

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ABSTRACT

Wounds are a condition of the skin's protective function damage due to trauma. The survey showed 120 respondents had wound in a month. Untreated wounds can cause infection. Commonly wound management uses povidone iodine 10% which can cause irritation and is toxic in the blood vessels. Ethanol extract of cananga contains flavonoids, tannins, and saponins as antibacterials and coagulants. Aloe vera contains acemanan and glycoproteins that prevent inflammation and accelerate skin regeneration. KENANG ARA Hydrogel is made with 40% extract of Cananga and Aloe vera (1:1). The research used quasi-experimental with pretest-posttest control-group design. The research was conducted in vitro and in vivo methods using 3 groups of white mice that were wounded and then given treatment (K1 without treatment, K2 gave povidone iodine 10%, K3 gave the product). The antibacterial sensitivity test resulted in a strong antibacterial with a 10.5 mm average inhibition zone diameter. The blood clotting test showed the product accelerated blood clotting until 3 minutes and had a significant effect compared to the negative control (sig 0.049, p>0.05). In vivo tested the reduction of REEDA scale (redness, ecchymosis, edema, discharge, approximation) and it found that the product 43.15% accelerated wound healing. It can concluded that the product accelerated wound healing.

Keywords: wound treatment; cananga; aloe vera

SLEFIX: Innovative Aromatherapy for Peaceful Nights

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ABSTRACT

Sleep difficulties are a prevalent problem affecting people of all ages globally. Studies have shown that a staggering 62% of adults worldwide and nine out of ten Malaysians suffer from sleep difficulties. While conventional methods such as medication may be effective, prolonged use of such treatments may result in adverse effects. Aromatherapy has emerged as a promising alternative for improving sleep quality and managing sleep difficulties. In this regard, Slefix, an innovative aromatherapy product, has been introduced to help individuals suffering from sleep difficulties. This product comprises a blend of natural oils, including honey, which contains tryptophan, a substance known to promote sleep. These oils have been carefully selected for their relaxing and sleep-inducing properties, working synergistically to create a calming and tranquil environment that can help promote better sleep. Previous research has indicated that honey can reduce stress levels in animal models, which promotes sleep. Slefix has been successfully commercialised in collaboration with Dr. Ridzuan Manufacturing Sdn. Bhd. To date, approximately 3800 Slefix products have been sold, with users providing positive feedback on their efficacy in improving sleep quality naturally and effectively without resorting to harsh medications or other invasive treatments.

Keywords: aromatherapy; honey; sleep difficulties; SLEFIX

Building Crack Detection Derived from Smartphone LiDAR

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ABSTRACT

The uses of the LiDAR technology in smartphones are tremendous. In the field of engineering and surveying, LiDAR has been widely used in the past decades for various applications and one of the applications is examining crack detection. Thus, this study is intended to assess the potential and accuracy of building surface crack detection from low-cost smartphone LiDAR data. A ridge detection tool in open-source Fiji ImageJ software was used to detect cracks from smartphone LiDAR. The findings show that smartphone LiDAR has the capability of detecting accurate cracks on building surfaces with the highest accuracy being 98%. The smartphone LiDAR sensor paired with a 12-megapixel camera has improved the overall outcome of crack detection on building surfaces. LiDAR has the lowest RMSE of ±1.719 cm in crack length and the highest of ±2.201 cm. The findings show that with the limitation of the scanning area, low-cost smartphone LiDAR offers great potential for accurate building inspection, especially for building surface crack detection.

Keywords: low-cost LiDAR; crack detection; ridge detection

Monitoring The Movement of Elephant Trail Using G

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ABSTRACT

Elephant movement trail that highlights its importance, objectives, and potential effects on conservation efforts for animals. Elephants need a trail to enable their normal migration patterns and maintain the health of the environment overall. This route is essential for maintaining the area's great biodiversity and it also helps to protect the endangered elephant population by reducing conflicts between people and wildlife and encouraging a mutually beneficial, long-term connection between the residents and these magnificent animals. Due to population increase, human settlement has spread into forest boundaries, which causes conflicts between humans and elephants that result in the loss of life and property. Elephants are tough to follow and monitor because of their large size and movement. Therefore, monitoring is required for the immediate detection and concern of elephant access into human settlements. For the elephant's intrusion detection and warning systems, several techniques have been used. A suitable way to track elephant behaviour is necessary for both wildlife conservation and the management of conflicts between people and elephants. Therefore, to get the best elephant trail using remote sensing and GIS techniques. The elephant trail was observed every month from June 2018 until December 2019. The study area is in Tasik Kenyir, Terengganu. Tasik Kenyir is a large, attractive artificial reservoir located in the Malaysian state of Terengganu. Covered with beautiful hills and surrounded by lush tropical rainforests, this reservoir is the biggest lake in Southeast Asia, with over 260 square km. The Kenyir Dam was built on the Kenyir River in the 1970s. As the result, there were three different maps of the elephant trail using GIS, and the land use related to the trail is also discussed.

Keywords: movement elephant trail; Gis techniques; remote sensing; Tasik Kenyir

Natureshield: Carrageenan and Ag-GO for Green Antimicrobial Nanohybrid Membranes

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ABSTRACT

The water treatment sector uses polymer membranes widely. However, biofouling on membrane surfaces has captivated academics and industry. The antibacterial properties of carrageenan, a naturally occurring polysaccharide have been extensively studied especially when combined with silver nanoparticles. This curiosity stems from nanocomposite membranes' rapid development. Embedding silver-graphene oxide (Ag-GO) modified nanoparticles into nanohybrid polysulfone (PSf) membranes added with kappa-carrageenan (ƙ-car) benefits to prevent biofouling. All Ag-GO nanocomposites were tested against Gram-negative bacteria E. coli using disc diffusion. The K1, K2, K3, K4, and K5 represent membranes fabricated with 0.1, 0.25, 0.5, 0.75, and 1.0 wt% of k-cars. The fabricated membranes are characterised based on the functional group, surface morphologies and hydrophilicity. The percentage of ƙ-car /Ag-GO in nanohybrid membranes significantly has inhibited E. coli bacteria, as seen by a larger inhibition zone diameter. Generally, the diffusion inhibition zone (DIZ) has affected antibacterial efficacy. The addition of ƙ-car/Ag-GO substantially has enhanced PSf membranes' hydrophilicity. According to FTIR spectra, the K2 membrane's broadest additional OH signal at 3379.31 cm^{-1} may be linked to ƙ-car/GO's hydroxyl (-OH) groups. The water contact angle (WCA) for the K2 membrane has reduced to 48.28° which confirmed that the membrane has enhanced the hydrophilicity. By adding ƙ-car as a pore-forming agent to PSf /Ag-GO membranes, it was found that the morphological characteristics and performance in ionic solute removal and water permeability have improved.

Keywords: kappa-carrageenan; polysulfone; silver graphene oxide; biopolymer; antibacterial

Honey Beads: Captivating Convenience with Encapsulated Malaysian Honey Bliss and Alginate Pectin

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ABSTRACT

The Food and Agriculture Organization reports global honey consumption, including Malaysia, at approximately 0.33 kg per annum, while production only meets 0.23 kilograms per annum, indicating a significant market potential. Honey, renowned for its medicinal value, however, lacks packaging innovation, with options such as glass jars and plastic bottles proving inconvenient, especially during travel. This study proposes encapsulating honey in bead form using alginate to address this issue, enhancing convenience. Three honey varieties, tualang, gelam, and kelulut, are standardized for quality by physicochemical and metabolomic analysis prior to bead formations. Honey beads were formulated and evaluated for mass production, quality, size, and spherification efficiency. Additional tests will cover shelf-life, heavy metals, microbial content, *in vivo* analysis, and preference tests. The honey beads have high nutritional value, inhibit bacterial content, and with no detectable heavy metal. *In vivo* toxicity analysis indicates safety with relativity low acute toxicity of the honey beads for oral consumption. The preference test showed an above-average score, with Tualang honey beads having the highest overall acceptance score. The honey beads initiative can boost the commercial value of local honey, offering a healthier sweetener option supporting national healthcare priorities and Sustainable Development Goals: Good Health and Well-being.

Keywords: honey; alginate-pectin; encapsulation; convenience consumption

Spatially-Enhanced Relational Database Management System for Academic Theses Management

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ABSTRACT

Integration of geographic information has emerged as one of the important components in any data management, especially in this modernization era. It involves various sectors including commerce, business, and environmental science. However, traditional database systems fails to organize spatial data that relying on papers, files, and simple spreadsheet software. Normally, in academic sectors where numerous theses are growing, bringing challenges in managing, storing, and accessibility, especially concerning geographical aspects. In addressing these challenges, this project aims to create a relational database for student theses that includes textual and geographical information. This initiative helps in addressing the gap between common text-based data storing and a more efficient system that integrates spatial aspects into academic knowledge through data collection, database creation, and results visualization. This project intends to provide a comprehensive system that allows effective management and querying of student theses. In other words, the creation of the front-end and back-end of a system. By utilizing applications such as PgAdmin4, PowerBI, and ArcGIS Dashboard, the database is transformed into a user-friendly system that allows users to query location, student details, supervisors, electives, and thesis topics automatically through a single GUI, eliminating the need for manual searching. This innovation not only improves accessibility for lecturers and students but also promotes an eco-friendly academic environment by minimizing paper documentation and simple database storage. Overall, it emphasizes the importance of Geographic Information Systems (GIS) in integrating spatial and non-spatial data, providing useful insights for real-world application and commercial value in optimizing student theses databases in other educational institutions.

Keywords: Geographic Information System (GIS); spatial data management; database system; relational database; student’s theses

Malaysia's Naval Shipyard Innovative Cartographic Geospatial Visualization System (MyGeoShipyard)

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ABSTRACT

Malaysia possesses a thriving marine legacy in the shipbuilding and repair sector, which plays a substantial role in the nation's economic expansion. The initiative was originally conceived through a series of deliberations with The Association of Marine Businesses of Malaysia (AMIM), which is the sole national entity that promotes the interests of participants in the Shipbuilding and Ship Repair (SBSR) industry. The present Malaysian shipyard map utilised by AMIM has deficiencies, notably the lack of a thorough inset map, impeding the assessment of precise proportions in spatial relationships. The symbols representing shipbuilding locations are ambiguous and imprecise, and the supporting descriptions are inadequate in providing useful information. This project suggests implementing a cartographic multi-scale map approach to improve the map. The objective of this project is to employ appropriate cartographic methods in order to create a spatial information map that is highly efficient for the SBSR sector in Malaysia. The map has been enhanced with a cutting-edge web-based geospatial visualization system that contains interactive applications that provide further information about shipyards in Malaysia. Implementing a multi-scale map method makes it possible to interactively explore complex data associated with facilities and locations, transcending the constraints of conventional shipyard maps. This work uses various cartographic techniques to generate maps of different scales by integrating intricate features and information about Malaysia's shipyard. Two distinct cartographic prototype designs, referred to as Map A and Map B, were produced as a consequence of the design process for the scaled maps of the Malaysian shipyard. The choice of Map B's design was mostly influenced by the outcomes of the map usability testing that was conducted. The method effectively addresses the cartographic challenges outlined in the problem, including the deficiencies in the previous Malaysian shipyard map. The approach successfully addresses the limitations in the flexibility of fundamental map design by properly representing geographic components, data, and connections using symbols on a map. The suggested improvements entail including real-time synchronisation of shipyard information to ensure the accuracy and usability of the data, hence promoting the Malaysian marine sector and enhancing the sector data visualisation system.

Keywords: cartography; GIS; Geovisualization; Maritime Mapping

Rubber and Oil Palm Empty Fruit Bunches (EFB) as a Composite Material for Cement Roof Tile

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ABSTRACT

This study delves into the environmental advantages of incorporating recycled rubber and oil palm empty fruit bunches (OPEFB) into cement roof tile composites. The integration of these materials not only benefits the environment but also proves economically advantageous by minimizing expenses related to landfills and incineration. The study focuses on developing composite samples (labeled A to D) with varying percentages of OPEFB fibers, subjecting them to tests for density, thermal conductivity, and water absorption. Fabricating cement roof tile molds tailored for specific testing further enhances the study's comprehensiveness. The findings elucidate the intricate interactions between cement, rubber, and OPEFB fibers, impacting the tiles' physical characteristics. Increasing EFB fiber content from 0 to 15 wt. % in the composite material results in a gradual decrease in density from 336.944 kg/m³ to 327.778 kg/m³. Water absorption shows a peak at 5 wt. % EFB fiber (13.08%), with a subsequent decrease at 10 wt. % (10.77%), followed by a rise at 15 wt. % (13.87%). The thermal conductivity varies among compositions, with the sample without EFB fiber having the highest value of 0.141 W/m°C. While offering promising advantages, variations in water absorption and unexpected trends in thermal testing underscore the need for further research and refinement to optimize material properties and ensure compliance with industry standards, thereby enhancing the practical applicability of these sustainable composite materials.

Keywords: sustainable composites; recycling rubber; oil palm empty fruit bunches (OPEFB); cement roof tile

Autonomous Ship Collision Avoidance Using Artificial Neural Network

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ABSTRACT

The advancement of autonomous navigation systems in maritime transport significantly enhances safety and operational efficiency. This research investigates the application of Artificial Neural Networks (ANNs) for collision avoidance in autonomous ships, aimed at improving decision-making processes. A multi-layer ANN model, integrating sensor data such as radar and AIS, has been developed to predict potential collision scenarios and suggest optimal navigational adjustments in compliance with COLREG regulations. The model was trained with a dataset comprising historical collision events, simulated encounters, and expert navigational decisions. Simulations were conducted in the Port of Tanjung Pelepas, Malaysia, with maneuvers initially performed by professional captains. Subsequent training and evaluation of the ANN model occurred under disturbed weather conditions, including rough waves, wind, and tides. The results demonstrate that the ANN model successfully avoids collisions and ensures safe maneuvering. This study underscores the potential of neural networks in enhancing autonomous maritime navigation technologies and suggests a scalable framework for AI-driven safety enhancements in the shipping industry.

Keywords: autonomous navigation; collision avoidance; artificial neural networks; maritime safety; COLREG compliance

Developing A Water Quality Monitoring Device for Drainage

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ABSTRACT

Water is necessary for all living things to survive, from the smallest germs to the biggest mammals. However, the pollution from industrial discharges, agricultural runoff, and poor waste management contribute to drainage water contamination. Therefore, to minimize the contaminated water, an initiative is taken to overcome the problem with the design of a water quality monitoring device for drainage. This study aims to design a device, and develop, and test its effectiveness of the device so that it is efficient and adaptable to the environment. The device integrates sensors and Arduino to provide real-time data on a few water quality parameters including values of pH, total dissolved solids (TDS), and turbidity. The device is set up and placed on the drain inside the UTHM campus in Pagoh, Johor, Malaysia to monitor water quality. The observed drainage water then was taken to the laboratory to analyze the accuracy of the reading. The results of pH values showed significant consistency, demonstrating the device's reliability. However, TDS measurements show slight variance, emphasizing the importance of cautious interpretation of on-site data. Turbidity readings, with a notable difference between on-site, 2101.5, and laboratory results, 15.7, indicated a significant difference due to limitations in the device's sensor calibration. The project satisfies its goals of developing a water quality monitoring system and comparing on-site results to laboratory results. Future studies should focus on understanding factors influencing on-site readings and improving device calibration for enhanced accuracy in environmental monitoring. Regular calibration and validation procedures are crucial for reliable field measurements.

Keywords: water quality; monitoring device; drainage; sensors; Arduino

Exploring Third Spaces Design Framework Based on The Experience of Residents That Helps to Reduce Psychological Stress and Support Community Well-Being in Low-Cost Public Housing in Malaysia

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ABSTRACT

The basic human need for a home that provides more than simply shelter underpins the need to understand the relationships between housing, health, and well-being. There is more emphasis on the quality of the home, with an agreement that the home is the foundation for resilience and well-being. There is a complex relationship between home and mental illness, as the environment in which a person lives can significantly impact their mental health. Some ways in which home can influence mental health include stressful living conditions. Therefore, having a safe and supportive home environment can help to protect people from mental illness. This research applied phenomenology in qualitative research methodology. The data was collected through semi-structured interviews. The data were analysed using a thematic analysis method assisted with ATLAS.ti version 8 software. The results show that residents in Malaysia's low-cost public housing have unique needs and preferences, benefit from the supportive and inclusive environment, enjoy activities contributing to social and skill development, are involved in activities for spiritual growth and spiritual healing and creative for innovation and flexibility in the third space design. Future research applies to economic activities in low-cost public housing.

Keywords: third space design; home environment; mental health; psychological stress

AlphaGel: A Revolutionary Antioxidant Approach for Effective Anti-Aging Solution

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ABSTRACT

In the realm of skincare innovation, α-tocopherol, a lipophilic antioxidant, plays a crucial role in combating oxidative stress, the primary cause of skin aging. However, its lipophilicity poses a challenge, hindering its penetration into the underlying viable skin layers and resulting in localisation in the stratum corneum. Moreover, α-tocopherol exhibits poor chemical stability due to its high sensitivity to light and oxygen. AlphaGel emerges as the culmination of this innovation, a nanoemulgel (NEG) harnessed from fractionated medium-chain triglycerides (FMCTs) containing α-tocopherol as its active constituent. NEG outperforms nanoemulsions (NE) in terms of physical stability, provides smaller droplet sizes, and optimises dispersions. By modifying NE into NEG, the limitations of restricted penetration and stability concerns can be addressed. AlphaGel's particle size of 163.4±2.5 nm demonstrates remarkable skin permeability with a narrow size distribution of 0.272±0.01 and good stability with the zeta potential value of -47.17±2.1 mV. AlphaGel not only amplifies efficacy and improves stability but also represents cutting-edge formulation technology. It also offers a promising advancement in skincare, positioning itself as an asset in the beauty and skincare industry.

Keywords: antioxidants; α-tocopherol; fractionated medium-chain triglycerides; nanoemulgel; skin aging

NanoAstax Gel: Unveiling Astaxanthin's Powerful Antioxidant Efficacy in Cutting-Edge Nanoemulgel Technology

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ABSTRACT

Astaxanthin (AST), a ketocarotenoid derived from seafood and microalgae, exhibits notable potential for skin health and UV protection. Its antioxidant properties effectively combat reactive oxygen species (ROS) within the skin layers. However, AST's oral bioavailability is limited due to its lipophilic nature and poor water solubility. When applied topically, AST's antioxidant capabilities can counteract oxidative stress and inflammation, contributing to its anti-aging effects. Nevertheless, penetrating through the stratum corneum remains a challenge. To overcome this problem, nanoemulgel (NEG) has emerged as a promising vehicle for enhancing AST delivery to the skin. This innovative product explores the benefits of AST for skin health, addresses oral bioavailability challenges, and examines the potential of NEG in topical AST delivery. Our innovative approach formulates a topical nanoemulgel, named NanoAstax Gel, using fractionated medium-chain triglycerides (FMCTs) oils and incorporating AST as the active ingredient. The nanoemulgel's particle size of 80.717±34.27 nm demonstrates excellent permeability and therapeutic effects. With a narrow size distribution of 0.438±0.18 and good stability, a zeta potential value of -11.47±1.37 mV, NanoAstax Gel stands out as a promising solution. It offers a compelling alternative to traditional topical antioxidants, exhibiting superior efficacy in scavenging free radicals caused by UV radiation. Its safety and effectiveness position it as a valuable commercial asset with broad appeal across diverse populations.

Keywords: antioxidant; astaxanthin; fractionated medium chain triglycerides (FMCTs) oils; nanoemulgel; transdermal delivery

CATEGORY C
(Foundation/Matriculation)

Earthquake Detector

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ABSTRACT

Earthquakes are natural disasters that can cause widespread destruction and loss of life. Moreover, it is nearly impossible to predict when and where an earthquake will occur. Therefore, early detection of earthquakes is crucial for implementing timely evacuation and mitigation strategies. This product explains one of the technologies and methods used for earthquake detection, an accelerometer. It delves into the principles behind this detection technology and its effectiveness in providing early warnings to the public. Additionally, this project discusses the challenges associated with earthquake detection, such as false alarms and the need for robust, reliable systems. In conclusion, this earthquake detector product aims to offer a comprehensive overview of earthquake detection technology, highlighting advancements and potential developments in this crucial field.

Keywords: earthquakes; accelerometer; earthquake detection; technology; developments

EYE (i) ROBOT: AI-Driven Approach to Home Assistants

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ABSTRACT

A technological invention, called smart home assistant, originally held the potential to improve quality of life. However, the idea was long buried by the masses due to its underlying unreliability. Hence, EYE (i) ROBOT serves as an AI-Driven solution to home assistants. Feature includes automatic speech recognition, face recognition, home automation and home monitoring. Made to offer a better solution than existing home assistants in the market. The goal is to create a home assistant that is reliable, natural-like, and capable of securing private spaces. This can be achieved by utilising various Artificial Intelligence (AI) technologies. Findings shows that EYE (i) ROBOT is able to identify humans. Moreover, it is able to control a smart light within reasonable timeframe. That being said, EYE (i) ROBOT is targeted for building owners whether it's a house or office, seeking security and assistance within their private spaces. In conclusion, EYE (i) ROBOT is a further step towards our mission to benefit humanity.

Keywords: artificial intelligence; raspberry pi; python

LockMinder

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ABSTRACT

House break-ins are one of the unresolved crimes in Malaysia that can instil a pervasive sense of fear and insecurity in society. This tends to occur when homeowners are either negligent or away from their residences for an extended duration. LockMinder is cutting-edge prototype that allows user to wirelessly manage their door's status. With today's technological advancements, this prototype ensures that users stay well-alerted about their home environment by creating direct communication between the homeowner and the door through MIT App Inventor and Arduino IDE. Harnessing the power of the Internet of Things (IoT), LockMinder enhances home security with features such as enabling users to lock or unlock the door remotely via the HC-05 Bluetooth module, alarming homeowners when the PIR sensor detects motion by the door, establishing instant authority contact linked through the app, and automatically locking the door after a certain period. Additionally, to address any concerns about app security, LockMinder prioritizes safety by requiring personal credentials before granting access to the application. Hence, by implying future improvements to LockMinder, we believe that it can penetrate the international market as it is easy to use and may decrease the percentage of house break-ins.

Keywords: home security; house break-ins; auto locking; Arduino; Internet of Things (IoT)

Thermoelectric Powered Watch

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ABSTRACT

Nowadays, wearing a watch is like an essential item for everyone whether it is to remind people of the time or for accessories. However, watches sold in the market are still using non rechargeable batteries which could lead to increases in e-waste as users have to change their watch's batteries every time it runs out of energy. Moreover, if these e-wastes aren't disposed of properly, it will harm the environment. Therefore, we have decided to create a ZAIS watch, a thermoelectric powered watch where a thermoelectric generator will be installed within our watch mechanism. Then, it will collect the heat from our body and generate the heat energy to electric energy and power the watch. Next, the electric energy will be stored in a rechargeable battery that will also be installed in our watch mechanism. This product is made to reduce the cost to change our watches' batteries, reduce e-waste, and to practice the usage of renewable energy sources in daily appliances. We believe that this innovation would bring a lot of benefits for everyone.

Keywords: thermoelectric powered watch; thermoelectric generator; generate heat energy to electric energy; rechargeable battery

Instant Fire Extinguishers (I.F.E)

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ABSTRACT

Instant Fire Extinguishers (I.F.E) are one of the effective methods to operate in severe disaster situations. Fire disasters have become a serious issue in recent years, causing countless deaths and injuries. Common fire extinguishers often suffer from various malfunctions like rust, or at worst, frequently missing pins. Considering the problems, an Instant Fire Extinguisher (I.F.E) prototype was made in this research, to represent a futuristic fire extinguisher for firefighting purposes. I.F.E's intention is to be less time consuming, be maintained easily and reduce the amount of fatalities at its best. This product also was crafted from match "head", austenitic steel, hydroxyl-terminated polybutadiene, biodegradable plastic, acetone, hydrogen peroxide, hydrochloric acid, monoammonium phosphate powder and gunpowder. The idea to make this product eco-friendly and safe was prioritised as this product was set to be used limitless on all ages. High authorities of the government worldwide were expected to get hold of I.F.E as it may reduce casualties during fire breakouts. In summary, I.F.E was created to save lives and maximise the termination of fire.

Keywords: fire extinguisher balls; disaster; emergency

PressurePal: Low-cost trash compressing bin

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ABSTRACT

PressurePal is a modern and unique product that facilitates rubbish in a safe and environmentally friendly condition by implementing the concept of hydraulic pump. Waste management is a significant problem in Malaysia as waste output outpaces the country's recycling rate. Our team developed this product with the aim of enhancing waste management efficiency in Malaysia, ultimately contributing to a well-balanced society in terms of consumption and packaging waste management contributing to the rising amount of flood cases over the years. This product can be effortlessly assembled using affordable and user-friendly tools like syringes. The primary objective of our project is to enhance waste management efficiency. Additionally, this will surely provide the foundation to build environmental allies to promote environmental sustainability for future generations. PressurePal offers significant benefits for waste management in educational and household settings. Our target markets include educational centres and households. Its user-friendly design caters to busy urban families, fostering inclusivity and independence.

Keywords: hydraulic pump; affordable waste management

Flux Insight

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ABSTRACT

The learning kit, comprising a magnet, solenoid, compass, wires, LED lights, and a multimeter, is tailored to deepen students' comprehension of Lenz's Law while engaging those with limited enthusiasm for Physics, especially in the challenging realm of magnetism. Flux Insight aims to illuminate the complexities of Lenz's Law, a concept crucial for personal, professional, and global development, often hindered by its mathematical intricacies and misconceptions surrounding induced currents. Traditional explanations reliant on mathematical expressions like Faraday's law and the right-hand rule can deter students uncomfortable with advanced math. Recognizing this struggle, our team collaborated with Physics lecturers at the Centre of Foundation Studies UiTM to address the issue through an interactive learning approach. By providing a comprehensive kit, we aim to empower curiosity, foster critical thinking, and enhance STEM skills, ultimately preparing students for future academic and professional pursuits. In conclusion, the development of Flux Insight arose from the challenges encountered in understanding Lenz's Law, aiming to provide students with a comprehensive educational tool. With its adaptability for various educational settings, including classrooms, home-schooling, and individual study, Flux Insight is expected to generate significant interest and inspire a lasting passion for science among learners.

Keywords: physics learning kit; Lenz’s Law; magnetism

Travellers Toiletries

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ABSTRACT

“Travellers Toiletries” is a travelling container with different compartments that can store soap, shampoo and other types of toiletries such as toothbrushes. This product was made to overcome the difficulties faced by travellers whenever they wanted to bring along their toiletries. In a recent survey we have done, it is found that many people face trouble with bringing along their toiletries as many soap and shampoo bottles are too large to fit inside their luggages or travelling bags. “Travellers Toiletries” is made out of High-Density Polyethylene (HDPE) because it is highly durable, lightweight and easily recyclable, which contributes to waste reduction and helps protect the environment. Additionally, it also includes a handle on the top made out of liquid silicone rubber (LSR) to make carrying it much easier. This way, travellers won’t have any issue bringing along their toiletries during travels to maintain their hygiene.

Keywords: Travellers Toiletries; container; soap; hygiene

Hydrobreeze

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ABSTRACT

Hydrobreeze is an eco-friendly fan which uses renewable energy. The main idea of inventing the Hydrobreeze fan is to save the earth from non-renewable energy and reduce cost in electricity. This is due to news concerning global warming in our country because of non-renewable energy usage and complaints about rising electricity bills because of its high usage in life. Therefore, the Hydrobreeze fan is introduced, which uses water as renewable energy to generate electricity. The usage of hydroelectric energy in this invention is hoped to contribute to the well-being of this planet and give benefits to individuals. This Hydrobreeze fan will be an attention grabber for everyone to buy and benefit from its functions. In conclusion, Hydrobreeze fans will be useful to protect our drowning earth and cut the electric bills.

Keywords: Hydrobreeze fan; renewable; electricity

KitarBot

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ABSTRACT

Rapid urbanization has given rise to a critical challenge the escalating volume of waste in populated areas, resulting in unsightly and unhygienic environments. Traditional manual cleanup methods prove inadequate, being slow, inefficient, and posing risks to workers. The consequential litter negatively impacts public spaces, affecting community well-being. Recognizing the urgency for an automated solution, this project introduces a versatile waste collecting robot tailored for urban environments called KitarBot. Built with Arduino sensors and specialized arms, this KitarBot autonomously detects and collects litter, expediting the cleaning process. Its unique design includes a special arm for efficiently depositing trash into a built-in bin. The robot's simplicity, user-friendliness, and low maintenance needs set it apart. It addresses the global need for automated waste management solutions amid growing environmental concerns. The KitarBot targets two markets household waste collection and city cleaning. In homes, it functions focusing on larger items such as cans and papers. On a city scale, the robot automates street cleaning, reducing common litter and aiding waste separation at recycling or trash centres. In conclusion, this autonomous trash collection robot stands as a solution to the persistent challenge of urban litter. By integrating advanced technologies, it not only enhances waste management efficiency but also contributes to community well-being, fostering a cleaner, more sustainable living environment. As environmental responsibility gains prominence, this KitarBot project marks a pioneering step towards a cleaner, greener future.

Keywords: robot; trash; cleaning; environment; Arduino

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ABSTRACT

In our daily life, garment drying is a crucial task for us to do at least two times a week. This is because we use our clothes every day. Therefore, we need to make sure that our clothes are always dry and available. Due to inconsistent weather like heavy rain, high humidity surrounding and excess exposure to the sunlight, this might lead our garment to a lot of problems such as wet clothes, growth of bacteria on our garment and cause faded colour on our garment. We invented this project called “I-HANG” to solve everyone's problem, especially the busy people. Our aim for this project is to facilitate the drying process by closing the roof automatically, turning on the fan and the UV light which is sensed by the rain sensor and humidity sensor. We use an Arduino UNO board to control our rain sensor, humidity sensor, UV light, fan and the 180-degree servo motor. When the rain sensor detects water, or the humidity sensor detects moist surroundings, it will send a signal to the motherboard thus the roof will automatically close, and the fan will be turned on. Other than that, the LED will also turn on and act as a UV light which will eliminate the bacteria in our garment. We have confidence this product able to tap into immense into market potential with our revolutionary weather-resistant, quick-drying solution. We envision significant returns as lot of consumers will gain benefit from this transformative clothing care. We strongly believe that our product has what it needs to attract the investor confidently, as this breakthrough promises a good results, making the risk worthwhile. Taking everything, this project revolutionized clothing care by shielding clothes from the rain and expediting drying with our new feature that can be able to make the cloth dry even faster. This multi functionality product will ensure convenience, efficiency, and eco-friendliness, marking a transformative shift in how we approach the simple yet essential task of drying clothes in our daily lives.

Keywords: Arduino UNO; rain sensor; humidity sensor; garment drying; clothing care

AquaVac

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ABSTRACT

AquaVac, a small robot that helps to reduce trash that's floating in the small lake and pond. This robot is well-functioned to clean up debris in the lake to have nice and clean scenery. This additional innovative robot is an alternative machine besides pool skimmer net that uses public awareness stick. The advantage of AquaVac which covered broader area to clean up instead using pool skimmer net. AquaVac is a creative and innovative idea to transform the function of vacuum used on the surface of water. It can collect and keep trash. It is made of lighter materials to remain floating on the water. In addition, the AquaVac is equipped with shredder which the blades function to shred debris into smaller pieces. It is also generated by a motor and controller to control the movement. AquaVac was invented to overcome some problems such as difficulties cleaning up floating trash on the water. This problem will cause drain clog in the future. Other than that, a function of shredder will help to save space and can collect more trash and debris since it's being shredded into pieces. Besides that, this small robot indirectly increases public awareness of the serious problem of water contamination. By this invention, the ecosystem of water will be better and cleaner in future with support through community involvement.

Keywords: AquaVac; floating trash; public awareness

Intelligent Walking Shoes for Blinds

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ABSTRACT

The World Health Organisation estimates that 80% of vision impairment is preventable, and as a result, many services and tools are offered to those who have it to assist them live normal lives alongside everyone else. Tactile pavement is one of the government's efforts to help the disabled be seen, and it is mostly found in pedestrianised zones. Intelligent Walking Shoes for Blinds are introduced to help the blind walk normally without any complications. Furthermore, these shoes are designed to solve the issue smarter than the conventional walking stick approach. This product contains a built-in obstacle-detection sensor and a Global Positioning System (GPS) that can be linked to electrical devices, like headphones, to assist with direction. The user's shoes are always linked to the application on their cellphones or the devices of their close friends or guardians. This makes it possible for the guardian to constantly track the user's whereabouts and guarantee their safety. This product is primarily designated for use by the government and medical fields to lessen their burdens. This product has a low cost and it can be marketed globally as visually impaired people are not limited to this country. To sum up, Intelligent Walking Shoes for Blinds are more useful for enabling the blind to lead regular lives, and it is guaranteed that any visually impaired individual can own a pair.

Keywords: Intelligent Walking Shoes; obstacle-detection sensor, GPS; visually impaired

AiCee

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ABSTRACT

AiCee is a brand-new fancy product for individuals who desires to enjoy their favourite drink cold for a long time. This is because AiCee is equipped with the function of maintaining the temperature of its contents for a long period of time by applying the concept of specific heat capacity and thermodynamics. We instilled the concept of thermodynamics by pumping out heat from inside of the AiCee. This function enables the inside of the AiCee to stay cold. The AiCee is suitable for people who are constantly under hot weathers such as athletes, outdoor people and fishermen. In a nutshell, the AiCee is a revolutionary product that is beneficial for the quality of life of individuals.

Keywords: thermodynamics; specific heat capacity; hot; cold

The Effect of Different Type of Enzyme on Meat Tenderisation

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ABSTRACT

It can't be denied that the tenderness of a meat is one of the main concerns of buyers and consumers when it is time to choose the best meat for their own purposes, such as cooking, etc. Meat can be tenderised in many ways, but this study is more focused on enzymatic tenderization techniques. Meat tenderization is a process to break down collagen in meat to make it more palatable for consumption. This study was carried out to identify the effect of different types of materials on the meat tenderization process. Among the materials used to tenderise the meat are papaya leaf, pineapple, and ethanol. The effect on the meat was observed on five factors, which are the size, the colour, the myoglobin concentration, the pH level, and the most important thing, the tenderness of the meat. The factors were being observed after the meats were left to rest with the materials marinated on them. The results gained from the experiment will expose the best material to be used in order to tenderise the meat in a matter of time, and hopefully they will help those who are still figuring out the best way to tenderise the meat. The materials used were also affordable and easy to find around the world, which will facilitate consumers.

Keywords: meat tenderisation

A.N.T.S: Ant Navigation and Trail Study

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ABSTRACT

As one of the most varied and essential insect groups for the environment, ants display a wide range of behaviours vital to the survival of their colonies and the environment. Despite the ecological importance of ants, limited knowledge exists regarding how different species' behaviours contribute to ecosystem dynamics, hindering effective conservation and management strategies. The objective of this experiment is to compare the structural aspect of the tunnel constructed and examine the foraging strategies employed by *Camponotus alboparsus* (Carpenter ant) and *Solenopsis Geminata* (Fire ant). These species are classified into separate genera and occupy diverse ecological niches; fire ants are known for their aggressive foraging and stinging behaviour, whereas carpenter ants typically nest in wood-based buildings. The experiment took place in a formicarium for five days. Both *C. alboparsus* and *S. geminata* were provided with a soil-based set-up and anti-escape measures. The tunnels' structural aspects, construction methods, and architectural intricacies were thoroughly examined and compared across both species. The foraging behaviour was also investigated by monitoring the recruitment and foraging activities. The response of both ant species to food sources, foraging efficiency, and their food distribution are examined. The result revealed a significant difference between *C. alboparsus* and *S. geminata* tunnelling and foraging behaviour. *C. alboparsus* exhibited a more detailed, shorter, and larger radius tunnel, while *S. geminata* exhibited a more extensive tunnel, longer and smaller in radius. In conclusion, this research enhances our understanding of nature and helps in developing efficient algorithms for tasks like route planning and excavation.

Keyword: ant behaviour; tunnelling; foraging; *Camponotus alboparsus*; *Solenopsis geminate*

RiceCycle EcoFertiliser

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ABSTRACT

Wastes such as food and plastic bottles are examples that contribute significant environmental pollution that can have effects on ecosystems, human health and economy. This project tackles the critical issues of the wastes by innovatively using food leftovers, specifically rice, fruit peels, and dregs, alongside recycling plastic bottles, to produce organic liquid fertilizer. This approach addresses the serious environmental challenge caused by the daily production of food waste and the global consumption of plastic bottles, which contribute to pollution and resource wastage. Simple methods by placing the food waste in biodegradable tea bags and putting it in a recycled plastic bottle containing rice filtering water to boost decomposition and nutrient release, promoting sustainable agricultural practices. The use of recycled plastic bottles serve as containers for this organic fertilizer, highlighting ways on reducing plastic pollution by promoting 3R concepts (reduce-reuse-recycle). Moreover, the materials used in this project can improve soil quality, promotes healthier plant growth, and promotes sustainable planting. The project illustrates significant importance towards adapting Sustainable Development Goals (SDGs) to the community benefits through its contribution to a sustainable economy, and it aligns with environmental sustainability goals by providing a workable solution to food and plastic waste.

Keywords: food waste; plastic bottle; organic fertilizer; Sustainable Development Goals

FRIEZAR 0

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ABSTRACT

The research introduces "Friezar 0," an innovative jacket equipped with advanced climate control technology. Utilizing microtubes circulating heating and cooling fluids, the jacket offers optimal comfort across diverse climates. Through a blend of wool and cotton, it ensures thermal regulation while revolutionizing the jacket market. The study explores the integration of physics to enhance functionality and comfort, highlighting its potential for global adoption. With a focus on adaptive temperature regulation, "Friezar 0" presents a novel solution for maintaining comfort in varying weather conditions. This innovation represents a significant advancement in textile technology, offering users a seamless and personalized experience. Through continuous research and development, thermodynamic clothing like "Friezar 0" holds promise for addressing comfort, energy efficiency, and health concerns in various industries.

Keywords: technology; temperature; heating; cooling; thermal

MyMushaf

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ABSTRACT

MyMushaf is an application developed to assist people who need help in reading the holy verses of the Quran. By using this application, users only need to scan the verses of the Quran, and MyMushaf will identify the position of the verses of the Quran that do not have surah references in the al-Quran, provide listening to the reading while giving Tajwid evidence, offer the interpretation of the verse, and provide the gist of the relevant verse. This MyMushaf application was developed as a result of the inspiration from the digital Quran. However, compared to the digital Quran, MyMushaf can make it easier for users to utilize the features of the digital Quran just by using a digital phone. MyMushaf can reduce the burden for someone to better understand the Quran, especially for converts and those who are less able in reading al-Quran. This application is developed by using 'flutter', which is a free software to be used to develop an application. The cost of developing MyMushaf is null. This application can be downloaded in Play Store for free and there is a premium subscription which only cost RM10.90 per subscription. Our profit is from the premium subscription and ads in the application.

Keywords: MyMushaf; tajwid description; digital al-Quran; al-Quran guidance; interpretation of the verse

InsomLamp

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ABSTRACT

InsomLamp is a sleep lamp destined for those who suffer from insomnia, with adjustable brightness and soft color temperatures such as calming orange or red to help relax in the evening. The lamp is equipped with built-in white noise, such as nature sounds, gentle music, or a rhythmic sound. An in-built timer gradually decreases the light brightness and the volume of white noise over time, which makes it easier to fall asleep. The lamp's smart alarm mechanism gradually raises light intensity and sound to gently wake users at the moment they choose, promoting a more natural wake-up process. By producing a tailored sleep environment, the InsomLamp enables users to adopt nightly rituals for better overall health. This study describes the design process, technical specs, and user input, demonstrating its potential as a useful tool for improving sleep quality and general health. In conclusion, the InsomLamp, created for those experiencing insomnia, is user-friendly and offers several additional benefits to help them improve their sleep quality in everyday life.

Keywords: sleep lamp; people with insomnia; improve sleep quality

Thermofusion Kettle

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ABSTRACT

Introducing an innovative jug kettle redefining beverage preparation. This dual-functionality kettle seamlessly heats and cools liquids, providing users with unprecedented versatility. The heating element employs electrical resistance and conduction to elevate liquid temperatures efficiently, while the integrated Peltier cooling module ensures rapid and precise cooling by absorbing excess heat. A sophisticated thermostat maintains the desired temperature, offering a user-friendly experience. Enhancing convenience, the jug kettle features a small, intuitive screen displaying real-time temperature readings. This digital interface empowers users to monitor and adjust temperatures with ease, adding a new dimension to beverage customization. Crafted with thermal insulation for energy efficiency, the kettle embodies a harmonious blend of cutting-edge technology and practical design. This appliance not only elevates the traditional kettle's capabilities but also opens avenues for diverse culinary applications, making it a pioneering solution for those seeking a dynamic and efficient liquid temperature management system. And the integration of a thermostat allows set temperature to be achieved that turns the kettle off once it achieved desired temperature.

Keywords: heating; cooling; kettle; desired temperature; heat transfer

ISHRAT.EY: Amplifying Women & Children's Preserved Rights

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ABSTRACT

Islam has secured women and children's vital rights in all aspects of their lives. Yet, because of the prevalent socio-cultural norms and practices in today's culture, the promise of Islam does not always convert into actual acts (Tiwari, 2021). The Mostly Muslim nation of Malaysia has always walked a fine line between protecting the rights of women, children and acknowledging the role that Islam plays in the daily lives of its citizens. Many Malaysians, especially women, lack an adequate awareness of one other's cultural practices and laws. The primary goal of this product is to determine how women and children's rights are protected in Islam. As a result, a linktree must be developed to assist individuals, particularly women and their children, in improving their comprehension of the subject. Hence, ISHRAT.EY is a linktree that provides legal information about women and children's rights based on Syariah law. The product's goal is to assist women and children in fighting for their preserved rights in hypothetical conditions. Moreover, this linktree also helps people to understand women and children's rights in the perspective of Syariah law. Instead of utilizing Syariah books to gather knowledge about Islamic law, we established ISHRAT.EY to manage our time so that we may simply and quickly acquire the information we desire. Besides, this linktree can help students, especially law students to do research about Islamic law for their assignments. To summarize, this product will be beneficial to women and children in learning about their preserved rights under Syariah law.

Keywords: Syariah law; women's rights; children's rights; education

TeddyGuard

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ABSTRACT

Safety is of paramount importance for everyone, especially women and children. However, despite its significance, guaranteeing safety remains a challenge due to prevalent cases of theft, rape, and robbery. Consequently, it is imperative for women and even handicapped individuals to be well-equipped with safety tools to mitigate such dangers effectively. While the market offers various safety tools, yet none comprehensively address the multifaceted needs for personal security. The alarming frequency of reported crime cases, both locally and internationally, underscores the urgency to address this issue. Through our research, we have identified three primary challenges. Firstly, children lack access to user-friendly safety tools suitable for their daily activities, whether at school, playing in the park, or accompanying their families. Secondly, women often find themselves walking alone, whether at work or during exercise, making them vulnerable targets for criminals. Lastly, existing personal safety tools do not cater to the needs of handicapped individuals. For instance, those with disabilities, such as individuals without limbs, struggle to find safety tools suitable for their everyday lives. Addressing these challenges requires innovative solutions that prioritize accessibility, ease of use, and effectiveness across diverse settings and demographics. By developing inclusive safety tools tailored to the specific needs of women, children, and handicapped individuals, we can enhance overall safety and security for everyone in our communities.

Keywords: safety tools; women and children; personal safety tools; tools; handicapped individuals

Muashir Calendar

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ABSTRACT

As a Muslim, they must fulfil the demands of worship prescribed in their daily lives. The worship needs to be performed individually or collectively which is called *fardu ain* and *fardu kifayah*. It is divided into two parts which are general worship and special worship. The *Maqasid Shariah* of the worship is to make a Muslim always closer to God by doing good deeds and staying away from vices and sins. However, Muslim society this nowadays has always been distracted by the enjoyment of this world provide. Most people are not taking seriously on how to improve themselves to become a better Muslims each day by day. This is why the crime rate nowadays has been increasing rapidly. The objective of this product is that to give an exposure and ways on how to improve our daily self by doing a sunnah that has been left by most of the Muslim's society these days. The main target audience of this calendar are students, teenagers, and people who are struggling to get their dean on the right path. In conclusion, struggling alone and getting confused, not knowing how to start improving oneself cannot be taken lightly by everyone, in fact we must help them on how to do it. Through the innovation of this Muashir Calendar, it can help the Muslim community to be more sensitive with the worship in Islam that have very realistic and practical values to provide goodness and well-being in the life of a Muslim.

Keywords: ibadah; Pendidikan Islam; innovation; Islamic calendar

Smart Home Energy Monitoring System

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ABSTRACT

The need for efficient use of energy in the residential is increasing nowadays. The manual approaches to old version electricity meters in every residential buildings are inefficient and inaccurate. Smart Home Energy Monitoring Systems aim to enable people to make more efficient decisions about their energy consumption. By giving users insights into their energy consumption patterns, the system uses real-time monitoring and data analytics to user and give user a capability to control electrical appliances remotely through Internet of Things (IoT) technology. Users specify the requirements and their expectations about this system. From the requirements, the system prototype is designed, developed and tested before being given to the user for review. User then give feedback and some adjustments has been made according to user's review. Smart Home Energy Monitoring System integrates technologies to monitor, analyze, and actively manage the energy consumption of household appliances, offering users unprecedented control over their energy usage for a more efficient and sustainable living environment.

Keywords: IoT; energy consumption; monitoring; remote

Gas Leakage Detector

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ABSTRACT

As today, accident cases due to leakage of Liquified Petroleum Gas (LPG) from gas cylinders inside of house or building still occur. LPG is colorless, thus LPG leaks are usually difficult to detect by normal human senses. The LPG leak can lead to a sudden fire when the LPG that fills the closed area catches a spark from a light switch or flame. To prevent this incident, Gas Leakage Detector has been created using Arduino components. The main idea of the Gas Leakage Detector is to continuously detect LPG leaks in closed spaces by using MQ6 Gas Sensor and as the LPG is detected, the exhaust fan or window will open automatically to ventilate the LPG to the outside. This can prevent this gas from reacting with the fire source in the room. Furthermore, the red LED light, LCD screen and buzzer will automatically turn on to alert people nearby to act immediately. Therefore, this innovation is able to prevent serious fires from happening. This product has great potential to be commercialized to the community because this innovation not only prevent the loss of property but also save lives. Thus, it mainly focuses on home and industrial safety. This product is expected to improve the existing hazard prevention system in the future.

Keywords: LPG leakage detection; MQ6 Gas Sensor; Arduino

The Physics Puzzle Expedition (ATOMIC ADVENTURE)

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ABSTRACT

Acquiring the skill of learning effectively is essential for enhancing students' quality. Bringing enjoyment in the learning process is vital to every student. This is attributed to the fact that enjoyment sparks the feel of curiosity and motivates students to explore further. Physics is one of the vital parts of science that demands the learners to master the importance of theory, concept, and consumption of formulas. In this case, majority of students are facing difficulty in memorizing and grasping the abstract principles of physics. Thus, it has led to the production of a hybrid board game called "Atomic Adventure". The objective of this innovation is to ensure that students derive both enjoyment and educational benefits from playing board games and aid the students to memorize and understand the basic physics concept. Atomic Adventure is produced by combining multiple board games and simulation. It is featured with few conventional board games features such as the use of dice. When players step on the box that has a question mark or exclamation mark, the player must answer questions related to the physics concept. Based on our research, students often find it challenging to visualize and conceptualize when learning physics, this game helps students understand physics easily while having fun with their friends. In conclusion, Atomic Adventure is looking forward to expanding and helping students to better understand and deepen the subject of physics to be used in everyday life.

Keywords: enjoyment in learning process; hybrid board game; basic physics concept

Easy Bee Trap (BEEZY Trap)

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ABSTRACT

Bees are important in our ecosystem as they move pollen from one plant to another and ensure growth and reproduction. However, bees can get hostile too, and attack people. This study focuses on the development of a bee trap known as “BEEZY Trap” for the use of the community of the Centre of Foundation Studies, Universiti Teknologi MARA. It was designed on the premise that bees are trichromatic creatures and based their colour combinations on ultraviolet (UV), blue, and green colour and their inclination towards blue light. The bee trap is light as it uses a recycled plastic container as its main body. A UV blue, fluorescent torchlight is attached inside the container and powered up by batteries. A small amount of cooking oil is also added inside the trap to further increase the attractiveness for bees to enter the trap. The device is easy to assemble, affordable, and should be able to attract wandering bees and trap them inside it easily and conveniently.

Keywords: bee trap; trichromatic; ultraviolet (UV); ecosystem; recycled plastic

EduTales: An Educational Comic to Support Students' Learning Experience at the Centre for Foundation Studies, IIUM

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ABSTRACT

Many students at this level struggle to engage with standard educational resources, emphasizing the need for innovative tools to improve comprehension of course contents. This study introduces EduTales, an education supplemental tool tailored for foundation-level students, aiming to address the challenge of disengagement with traditional course materials. For this, EduTales leverages the inherent appeal of comics to create an engaging learning experience. Through incorporating interesting characters, scenes, and storylines, EduTales's objective is to enhance students' understanding of their course contents while ensuring enjoyable learning experience through appealing pictures, conversational delivery, and interesting storylines. It provides learners with crucial contexts for understanding the essence of the subjects, as well as delivering exciting backgrounds and clear graphics to make the plot easy to understand. To assess the effectiveness of EduTales, two methods are employed, namely Pre-Test and Post-Test, as well as a survey to gauge feedback on the tool. The findings indicate a positive response from students, who found EduTales both engaging and helpful for understanding complex topics - even surpassing initial expectations. Additionally, EduTales's availability in both online and flip-book formats proved to be popular among students, suggesting its potential for broader usage and commercial success. By offering EduTales to other universities, educators can provide students with an effective tool to improve comprehension and engagement. In conclusion, EduTales provides major benefits, including improved comprehension, ease of access, and the usage of relatable lexicons for the youth, making it a versatile and valuable resource for enhancing educational outcomes in modern learning environments.

Keywords: education supplemental tool; learning aid; comic-based learning; student engagement; understanding

EarthSmart Toys

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ABSTRACT

Plastics pollution is a pressing global concern that needs to be resolved quickly as it can cause a serious damage to the earth due to the plastics' inability to be decomposed safely. In this matter, plastic toys play a very big role as one of the main contributors in worsening this issue. In fact, plastic toys constitute 6% of all plastic found in landfills and to make things worse, even the production of it releases all sorts of toxic emissions into the atmosphere. Thus, it has led us to create this project called EarthSmart Toys. The primary goal of the making of this product is to mitigate the amount of plastic consumption and to make toys that are chemically safer for both children and environment. EarthSmart Toys will be made fully from plant-based materials, including glycerine and food wastes. Additionally, our product will also be beneficial to the nature upon disposal as it can also act as a fertilizer to the soil and reduce the impact on nature. Furthermore, this product can be mainly commercialized to the parents, kindergartens and other child-centric establishments. In conclusion, EarthSmart Toys can be used to tackle plastic pollution as it can help to reduce plastic wastes and the emission of toxic gases to the atmosphere.

Keywords: EarthSmart Toys; pollution; toxic; plant-based; kids

Malay Language Grammar Mastery through Video Game 'Tatabahasa Adventures @ Cabaran Tatabahasa' among Students of Centre for Foundation Studies, IIUM

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ABSTRACT

Considering students nowadays are more exposed to casual language styles that do not adhere to standard grammar rules especially in Malay language, therefore their ability to practice the right grammar rules either in speaking or writing can be worsened. Moreover, some students may find grammar less interesting to study compared to other subjects. 'Tatabahasa Adventures' is a comprehensive approach to provide IIUM foundation students with a context-rich environment while learning the common mistakes in Malay language grammar. 'Tatabahasa Adventures' has been designed for students to personalize their own level while playing this game. 20 students of Centre for Foundation Studies, IIUM, have been asked to try out this video games. The effectiveness of this video game has been praised as it has become a platform for students to learn grammar repeatedly in a fun way. 'Tatabahasa Adventures' recognizes the value of video games as an effective method for grammar learning to help students across Malaysia to master in Malay language grammar.

Keywords: grammar; Malay language; context-rich environment; video games

Self-Heating Canned Food

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ABSTRACT

Self-heating canned food is an easy solution for consumers to enjoy hot meals anywhere without needing heating sources. This paper presents the development of a self-heating canned food system designed to provide safe reheat of packaged food items. The system is included with a portable can equipped with a chamber for storing the food and a heating chamber where it contains chemicals that can produce heat. The performance of the self-heating canned food system was assessed. Results indicate that self-heating can achieve fast and thorough heating of food contents, reaching the desired serving temperatures within minutes. Additionally, consumer feedback shows high levels of satisfaction with the convenience and the efficiency of the self-heating mechanism. Overall, this study highlights the potential of self-heating canned food systems as a practical solution for providing hot meals in many situations, including outdoor activities, emergency situations, and busy lifestyles.

Keywords: self-heating can; hot meals; canned food

GazaHope

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ABSTRACT

In the era of conscious consumerism, individuals are increasingly seeking ways to align their purchasing decisions with their values and beliefs. This abstract introduces a novel mobile application designed to empower users in making informed choices regarding the origin of products in relation to Israel. The Pro-Israel Product Scanner utilizes barcode scanning technology to provide users with real-time information about a product's association with Israel, allowing them to make ethical and informed purchasing decisions. The app not only assists users in avoiding products associated with Israel but also provides additional features such as news updates on Palestine and a rewards program to further incentivize user engagement. With its potential to cater to the growing demand for ethical consumption and support global movements like the Boycott, Divestment, and Sanctions (BDS) campaign, the Pro-Israel Product Scanner represents a valuable tool at the intersection of technology and social activism. Its availability on both iOS and Android platforms ensures accessibility for users worldwide. By empowering consumers to make conscious choices, this app contributes to a more socially responsible marketplace and fosters awareness about the impact of consumer decisions on global issues.

Keywords: barcode scanning; Pro-Israel; news update; application

Ecosorter

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ABSTRACT

One of the pressing issues faced by communities worldwide is waste management and disposal. In Malaysia, improper garbage disposal has depended heavily on landfills and poses a significant threat to both the environment and public health, leading to a range of interconnected issues. The project aims to assist in tackling the problem of improper garbage disposal by segregating the waste. As well as to emphasise the importance of waste reduction, recycling, and the adoption of sustainable waste management approaches at the local, national, and global scales. With that being said, we have created the Ecosorter. It uses the Arduino Uno platform to detect different types of material that we want to recycle, then opens the lid to the correct bin of material to make it easier for the user to segregate their trash into the correct bins. According to the Malaysia Investment Development Authority, in 2021, a total of 13.95 million metric tons of municipal solid waste were generated per year in Malaysia, equivalent to 38,207 metric tons generated per day by households and institutions. This showed an increase from previous years, as municipal solid waste amounted to 13.91 million metric tons and 13.88 million metric tons in 2020 and 2019, respectively. In summary, Ecosorter represents an innovative solution capable of addressing the global challenge of improper garbage disposal, offering sustainable alternatives that hold considerable market potential for various stakeholders, including households, environmental departments, and garbage collectors.

Keywords: Arduino Uno; garbage; waste management; environment; disposa

EcoPaws-Away

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ABSTRACT

Urban and suburban areas often face issues with stray cats, which cause nuisances such as outdoor defecation, disruption of household pets, and conflicts. These cats carry diseases, pose risks to humans and wildlife, cause property damage, and trigger allergies. Managing cat populations in residential areas is complex and often leads to neighbor disputes. There is an increasing demand for a humane, eco-friendly, and safe cat repellent solution. Current methods, like chemical deterrents and physical barriers, have limitations. Therefore, a reliable cat repellent system is essential to address these issues and provide a practical way to deter unwanted feline intrusions while ensuring the well-being of all parties involved. EcoPaws-Away is a product designed to prevent cats from damaging valuables and keep them away from potential dangers. It uses 100% natural ingredients, including eucalyptus and rasberry. The product aims to demonstrate the repellent's effect on cats, the use of natural ingredients, and its impact on humans. It is tested on a few cats to verify its effectiveness. The primary target audience is the community dealing with cats exhibiting problematic behavior. It is also eco-friendly and ethical pet care solution. Its natural ingredients and user-friendly design make it an excellent product with significant commercial potential in a market that values sustainability which aligns with the green revolution in consumer products and offers a guilt-free solution for pet owners. EcoPaws-Away is more than a product, it's a movement set to dominate the eco-conscious segment of the pet care industry, resonating with a broad audience.

Keywords: natural ingredient, cat repellent, eco-friendly, eucalyptus and sustainability

SMART Food Warmer

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ABSTRACT

In the modern era of technology, food delivery services have committed a lot to today's society as it offers convenience and time-saving. However, one of the major problems faced by most food delivery service companies is getting a low-star rating due to the food delivered being cold as the delivery duration may take longer than expected. The current packaging procedure using thermal insulated bag may fail to insulate food effectively and is unable reheat the food if the restaurant failed to provide a freshly made meals. Thus, SMART Food Warmer is invented to counter this issue. The objective of this product is to increase the efficiency of food delivery services by providing a simple and efficient method for heating food and beverages without the need of external heat sources. The normal thermal insulated bag is improvised with a container installed inside. Peltier module is used as the heating element, in which will activate when switch is on. The Peltier module is standardized to reach certain temperature and remain to prevent overheating. Food that has turned cold was used to demonstrate and it was found that it reached the standard of freshly made meals after 10 minutes in an operating SMART Food Warmer. The main target audiences are food delivery services companies, food delivery runners and food business owners. In conclusion, improvising food delivery services is essential in order to meet consumer needs and adapting to changes in the market and regulatory environment. Hence, companies can improve their growth, enhance customers' satisfaction and build a strong, sustainable business.

Keywords: food warmer; fresh; food delivery

HOUSEGODA Application

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ABSTRACT

In this era, it can be difficult and time consuming to disorder the ideal spot to call home in today's dynamic and fast paced world. Currently, customer often faces difficulties in registering their information and reserving houses through traditional means, leading to potential data entry errors and inefficiencies. Besides, customer also has difficulties in searching house for renting and not able to review house data information. Therefore, the purpose of this project known as HOUSEGODA based on mobile application is developed to manage rental house around Sabak Bernam, Selangor. This application able to create booking for rental house, searching house for renting purpose by location, and can review house based on user perspective. The project used Agile methodology using five phases including meet & plan, design, code & test, release, and feedback. As a conclusion, this application is a transformative solution for seamless house searching with a user-friendly platform that benefit both renters and owners in managing rental process. Besides, it also can be one of potential application to provide help owner in promoting their house for rent in Sabak Bernam area.

Keywords: mobile apps; rental house apps; booking apps

BEARKUR

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ABSTRACT

Referring to the interpretation of the Child Act (2001), a child is defined as a person under the age of eighteen. Children are a national asset and the lifeline for the country's future development, hence it is crucial for children to grow up healthy both physically and mentally. It is with considerable concern that we acknowledge the data acquired through the Malaysia Child Statistics 2023 published by the Department of Statistics Malaysia (DOSM) shows an increase in the number of children under five years old in this country suffering from severe nutritional deficiencies by 0.3 percent in 2022 compared to 2021. Among the factors contributing to this increase is the practice of unhealthy eating among children. Children prefer to eat sweets such as candies. Most candies on the market contain preservatives and high sugar content. Therefore, a food product innovation named Bearkur was created as an initiative to replace the candies found in the market. This product is made from halal and high-quality ingredients such as dates, honey, and bovine gelatin. Bearkur comes in an attractive form that can capture children's interest in choosing healthy jelly candies and expose them to sunnah foods.

Keywords: sunnah foods; health; children; dates; honey; jelly

Ladder of Faith: Interactive Islamic Board Games

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ABSTRACT

Playing is one of the most important activities in children's development. It is also closely related to brain function, emotional formation, behaviour and attitude of children. Therefore, appropriate and non-neglectful games need to be introduced by parents and teachers in order to make playing and learning sessions a learning approach for children and it has been proven to be effective in changing the learning experience into something more pleasant and interactive. Thus, we have innovated a famous board game called "snake and ladder" to make it more useful and able to increase knowledge about Islam. This innovation is named "Ladder of Faith" which is a concept of Islam such as attributes that must be known by Muslims, 25 Messengers that must be known, the names of Angels and many more. The specialty of our innovation is that there are several questions about the Islamic religion and players have to answer the questions asked to progress forward. The objective of this innovation is to foster the spirit of today's generation to learn religious knowledge while exposing them to interesting, beneficial, and not boring games. This study uses qualitative methods through library research to find primary information related to the approach of play therapy according to Islamic views. The information obtained is from various sources such as books, journals, hadiths and the Quran as well as articles. This information is collected and screened and analysed using content analysis techniques. In conclusion, it is hoped that this game can be used by our main target group, which is children, and be used as one of the interactive learning materials in kindergartens and schools.

Keywords: playing; board game; ladder of faith; interactive

AQUASOLAT

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ABSTRACT

Prayer, an act of worship that began to be obligatory on all Muslims in the fifth year of Hijrah on the night of 27 Rajab. This worship was revealed to the Prophet Muhammad SAW through the events of Isra' and Mikraj where he travelled from Masjid al-Haram to Masjid al-Aqsa and then ascended to Sidratul Muntaha to meet Allah SWT. However, arises a problem for Muslim travellers who like to do adventurous activities such as exploring the forest and climbing mountains or hills to perform obligatory prayers while doing these activities. This is because of difficulties in finding the direction of Qibla in certain area. This project discusses how to help users perform their prayers despite being far from the comfortable facility. After several discussions and extensions of ideas, we came up with a product of water bottles complete with appliances to find qibla and prayer mat called AQUASOLAT. As for the target market, we believe that AQUASOLAT will be most helpful to mountain climbers and explorers, but it can also extend to people who love to travel to a non-Muslim country or even to families who are always camping in the forest where the facilities may be limited. In conclusion, the act of salah definitely cannot be taken lightly in any matter, and we hope that AQUASOLAT can render a small help to those who need it.

Keywords: prayer; mount climbers; AQUASOLAT; qibla

ABARE: Muslim Menstrual Application

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ABSTRACT

ABARE is an application created to help Muslim women record and calculate their menstrual cycles. This innovation was sparked by seeing a few teenagers or women who are still confused and unclear about their cycle, especially those who experience irregular periods. This also leads to confusion in determining the law regarding prayer, fasting, reading the Quran and so on. In addition, this issue also stems from lack of exposure before puberty regarding the science of menstruation, *istihadah* and childbirth. Therefore, the "ABARE" application was created to solve the problems mentioned. This is to ensure our validity and confidence in performing worship because purity from *hadas* is one of the valid conditions of prayer. The specialty of this application compared to existing applications is that it is more friendly to Muslim users because it is equipped with details related to *istihadah* blood such as how to determine it, the types of *istihadah* blood and the mandatory things that need to be done when experiencing it. Details related to *istihadah* blood are not yet available in any application on the market. In addition, this 'ABARE' application is equipped with practices that can be done when sick such as authentic prayer and remembrance of the Prophet Muhammad SAW. In conclusion, through this innovation we hope to help young people or Muslim women understand their blood-related problems better and accurately.

Keywords: ABARE; application; Muslimah; menstruation; *istihadah*

Ihsan Wear: Worship Friendly Robe

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ABSTRACT

Prayer is the second pillar of Islam that is obligatory for all Muslims. The obligation to cover the aurat is one of the valid conditions of prayer accepted by Allah SWT. Men's aurat is from the navel to the knees while women's aurat is the whole body except the face and palms. With the development of today's fashion trends, Muslim women no longer have problems finding prayer accessories. However, there are various challenges faced by Muslims (men) such as cultural expectations, fashion trends, and at least the right choice of clothing to cover the aurat, especially when traveling. Thus, this study suggests a solution to the challenges faced by Muslims by creating a travel-friendly robe. The objective is to provide practical options and facilitate individuals who wish to fulfil their religious obligations. This product has the special feature of being equipped with a prayer rug and a Qibla direction compass. In addition, the selection of colours, the type of fabric that does not need to be rubbed and the design that is easy to carry are in line with the traveller-friendly concept. The marketed price is also reasonable in accordance with the quality and suitable fabric. As a conclusion, it is hoped that with this product it can help Muslims pray with full devotion and cover their aurat perfectly.

Keywords: prayer; aurat; worship; Muslims; fashion

Tapipoon (Tapioca Cutlery)

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ABSTRACT

Ever since the realisation of the fact that plastic products can pollute our environment, many parties have stepped in to help reduce the usage of it. This innovation comes to light when our group is tasked by our lecturer to propose a product of our choice to be innovated. Which type of cutlery is suitable for food consuming? We then proposed our product, Tapipoon. Tapipoon is a short form of two words, “tapioca” and “spoon” which signifies the usage of tapioca (manihot esculenta) into daily cutleries. The objective of this product is to promote awareness of taking care of mother nature through the usage of our green-based product and to educate the public about the existence of such edible cutleries. We promoted this product by using a video and a presentation slide which explains further details of the purpose of this product. We’ve received a lot of positive feedback from our lecturer and others regarding this product. In the future, we plan to commercialize our product to local stores and ‘mamaks’ before slowly offering it to bigger cutlery companies such as Tupperware. To conclude, we successfully managed to convince almost everyone regarding the significance of this product and to hopefully be able to protect our mother nature through our product.

Keywords: tapioca; mother nature; cutlery; green-based

ECOOIL: Waste Cooking Oil Collector Machine

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ABSTRACT

Millions of used cooking oil are thrown into the sink, poured down the drain or thrown on the ground causing damage to ecosystems, river pollution, clogging and dirty pipes and drains. Our intention of introducing the “ECOOIL” is to reduce environmental effects, greenhouse gas emissions and other types of pollution that could be resulting from oil consumption. Additionally, this invention might prevent clogging and reduce the flow capacity of the pipes. ECOOIL also can help cut diesel usage in Malaysian transportation by replacing fossil diesel with biodiesel made from palm oil recycled from collected used cooking oil. We believe that the concept of ECOOIL, which would collect and solidify used cooking oil and offer cash in exchange, has found a way to begin correcting this situation. This ECOOIL comes with a design that is user-friendly controls, making it accessible to a wide range of users. This machine is suitable and conveniently helps households, industrial kitchens or restaurants dispose of their used cooking oil without harmful practices. Through the automation of the collection process and the promotion of appropriate disposal methods, our ECOOIL aims to lessen the negative environmental effects of used cooking oil while fostering effective recycling of this vital resource. The machine creates an environmental awareness by encouraging individuals to participate in sustainable waste cooking oil management practices.

Keywords: waste cooking oil; machine; environmental effect; ecosystem

CASIC – Children Assistant System in Car

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ABSTRACT

More than 1000 children have perished because of the heatstroke from being left in the car for an extended period. Section 31(1)(a) of the Children Act 2001 defines carelessness as leaving a kid in a car unattended. If convicted, they will be fined not more than RM50,000 or imprisoned for not more than 20 years or both. A hectic daily existence in which both parents work, requiring the children to be transported to a nanny's residence or nursery for care. Parents' condition, such as excessive exhaustion, forgetfulness, and out from their daily routine, are among the variables that contribute to incidents of children being left in cars for an extended amount of time, resulting in death. To combat this 'forgetfulness' element, a mechanism has been devised to warn parents when children are brought together in a car, which serves the primary objective of this innovation. The system is divided into three sections: input sensors, the system brain, and the outputs. There are 3 sensors used named as heat sensor, sound sensor and movement sensor. The second section is the system's brain, which uses the Arduino UNO to regulate the system's operation based on the several conditions. The last section shows the outcome of the brain system's instruction to turn on the fan, forcefully to slightly open the side windscreen, and then transmit a warning to the parents via mobile phone using the Bluetooth platform. This situation provides an opportunity to lower the temperature in the car while the parents get into the scene. This device is expected to have a significant influence on parents, particularly in terms of kid protection, enhancing its economic potential. This invention can provide parents with peace of mind and assist them in overcoming the problem of ‘forgetfulness’, particularly when it occurs outside of their usual routine.

Keywords: forgetfulness; sensors; Bluetooth; Arduino UNO

Apaisant Comb: A Multipurpose Brush to Help Maintain Healthy Hair and Scalp

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ABSTRACT

In the field of personal grooming and hair care, innovation continues to drive significant advancements. Most people surely have little to no time to take care of their personal self-care due to living in such a busy and hectic life. People are very concerned about the health of their hair and scalp, yet many of them are too lazy and busy to follow the many steps of routine to care for their hair and scalp. Moreover, conventional hair care procedures sometimes miss the importance of scalp care, focusing on just hair strands rather than the scalp environment, where the healthy hair growth begins. A special brush that functions as a scalp messenger and secretes nourishing hair serum is designed to make it easier for people to achieve healthy hair and scalp wellness has been set as the objective of this innovation. The innovative product combines a traditional hairbrush with a discreet, portable vibrator and an integrated oil dispensing system. This unique combination offers users a multifunctional device that enhances self-care routines. The brush's design includes a reservoir for storing essential oils or hair serums, which can be dispensed through the brush's teeth, allowing for easy application while massaging the scalp. Apaisant Comb which stores the serum in it can help the users to apply the serum in a more efficient way as the users brushes their hair while having the serum poured in a small amount close to their scalp evenly. Furthermore, the shape of this brush which includes an ergonomic handle helps the user to grip on the brush better. This innovative product is designed to revolutionise hair care, offering a convenient and enjoyable way to maintain healthy hair and scalp. It can be said that this innovation can change the habit of people in maintaining the healthy hair and scalp thus will higher the commercialize potential in the beauty industry.

Keywords: Apaisant Comb; scalp; hair; hair care; headache; serum

Interactive Prophet's Storybook

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ABSTRACT

Books are tools used as the primary basic material and a source of information on a specific field. Children's books are a form of reading material written and offered to children and read or used by them. All children's books need to "teach something" not just "inform" because their main audience is children, who are less experienced and need to be educated. Therefore, suitable reading materials are crucial in shaping their personalities and intellect. However, the current technological trend has caused children to be less interested in reading storybooks; they prefer watching videos on social media instead. Several studies have been conducted to identify the number of children knowledgeable about the stories of the prophets. Research has found that less than 50% of children are not exposed to these stories. Therefore, an innovation needs to be developed to make storybooks more engaging for children to read. The objective of creating the 'Interactive Prophet's Storybook' is to make learning sessions for children more enjoyable and to help improve children's reading and listening skills. Features added to this product including audio to guide children in reading and flashcards to help children review more productively. To attract children's interest in reading, this product has been developed using pop-up effects. This product, which focuses on existing materials and recycled materials, helps preserve the environment while reducing the production costs of the product. In conclusion, this product incorporates various features that will increase reading interest among children and instil positive values in them.

Keywords: children storybook; prophets; interactive; recycled material

Effortless Ablution Turbine

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ABSTRACT

The high average water consumption in Malaysia reflects less prudent practices in the use of natural resources. Most Malaysians seem not to practically save water, especially when taking ablution, where the water consumption exceeds the actual need. This situation contributes significantly to the amount of water consumption per capita that exceeds the guidelines set by the UN, especially in residential areas. This inefficient use of water is one of the main factors in increasing the average daily water consumption in Malaysia, which requires creative solutions to increase the awareness and effectiveness of water use among the population. Effortless Ablution Turbine is a smart innovation that aims to obtain electricity through the utilization of waste ablution water or rainwater. Created with aftermarket components, these devices consist of dynamo-like electronic devices that convert kinetic energy into electrical energy through rotation. This device is installed in the water channel or drainage system, the turbine moves according to the water flow. With the main focus in the mosque area, this product is designed to maximize the utilization of community ablution water waste. This discovery is not only efficient in reducing water wastage but also makes a positive contribution to the sustainability of nature by saving water resources that were previously neglected. With a progressive concept, Effortless Ablution Turbine is an innovative step in reversing energy needs and generating awareness of environmental sustainability.

Keywords: ablution; rainwater; dynamo; electricity; environmental sustainability

The Tadzkir

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ABSTRACT

The Tadzkir addresses the common challenge faced by many individuals who struggle to remember and recite du'a' before embarking on a trip or while driving. This product aims to remind the people of doing spiritual practices in our daily life, particularly in the context of ensuring safety and seeking protection from Allah SWT during journeys. A significant number of people encounter difficulty in remembering to recite du'a' before commencing a trip or during driving, thus, they may not get the spiritual and safety benefits associated with reciting du'a''. The primary objective of The Tadzkir is to serve as a reliable tool that encourages Muslim, especially drivers, to remember and recite du'a' for safety and protection. The product provides timely reminders and facilitating a seamless experience for users to follow the recitation through auditory voices such as dhikr or nasheed. The development process of The Tadzkir uses simple technique, including Arduino-based coding, microcontrollers, speakers, and custom 3D printing for the product's body. This integration of hardware and software components allows the invention of a user-friendly, portable device that blends seamlessly into the user's vehicle environment. The commercial potential of The Tadzkir is promising. The product can be effectively marketed through popular online platforms and reaching a wide audience and addressing the spiritual and safety needs of diverse users. In conclusion, The Tadzkir represents an innovative fusion of technology and faith, providing a practical solution for individuals seeking a reminder to recite du'a' for safety and protection during their journeys.

Keywords: reciting do'a; journey; software components; portable device; reminder

SecureSolah Mat

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ABSTRACT

Prayer mat is one of the most significant equipment that is used by Muslims to perform *solah* (prayer). A prayer mat is placed on the ground in order to maintain cleanliness throughout the worship especially in position of *sujud* (prostration). Despite the fact that there are many various kinds of mats available on the market, most of them still require few adjustments and improvement to ensure the safety and convenience of a worshipper. One of the major problems that most worshippers faced, particularly women is that their handbags that contain valuable items such as mobile phones and wallets are often stolen while performing their obligatory prayer and ablution. Therefore, the main objective of innovating this product is to lower the risk or the possibility of theft and to guarantee worshippers to remain solemn and calm while performing prayers. This innovation calls for the addition of a new compartment; a dome-shaped part at the front of the mat that will serve as the storage area for purses and handbags, as to ensure the safety of the stored goods. The prayer mat also could form into a bag that enable to store prayer garments. In addition, a bag strap is also added at the back of the mat to transform it into a backpack. Thus, make it easier for users to carry while performing their ablution and carrying the bag anywhere. This product can be commercialized in famous prayer clothing boutiques. In conclusion, these improvements are able to provide a safety and convenience experience.

Keywords: solah mat; theft; security; compartment; backpack

Student's Helper in Teaching: Mechanical Whiteboard Cleaner (MWC)

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ABSTRACT

Learning solely in theory lacks practical application, hindering comprehensive mastery of knowledge. The prevalence of theoretical education neglects practical skills, resulting in unengaging learning environments. To address these issues, the Student's Helper in Teaching: Mechanical Whiteboard Cleaner (MWC) offers a solution. MWC expedites the erasing process, overcoming challenges like insufficient height and fatigue associated with traditional methods. Additionally, it incorporates a projector screen, bridging the technology gap in rural schools. Operating without electrical sources, MWC eliminates cost barriers, aligning with the M.E.C. principle of Mechanical, Easy, and Cheap design. By enhancing classroom efficiency and technological accessibility, MWC not only resolves mundane educational challenges but also inspires students to pursue practical applications of their knowledge, enriching their educational experiences and career prospects.

Keywords: whiteboard, projector, mechanical, teaching and learning, innovation.

Digitalization of Student Activity Approval: A Microsoft 365 - Powered Solution for Cost-Effective & Sustainable Campus Operation

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ABSTRACT

The "Digitalization of Student Activity Approval" represents a groundbreaking advancement in academic administrative processes, developed using Microsoft Form and Microsoft Flow within the Microsoft 365 suite. This innovative system, provided for free by the Ministry of Education to all universities, is designed to significantly reduce the costs associated with system development while simultaneously contributing to the institution's commitment to sustainability through the reduction of paper usage.

Keywords: Microsoft 365 Integration, Cost-Effective Development, Green Campus Initiative, Streamlined Proposal Workflow, Enhanced Collaboration

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