NSIEX+RS 2025
NEGERI SEMBILAN INTERNATIONAL EXPOSITION

HARMONY IN PROGRESS:

INTEGRATING SCIENCE, TECHNOLOGY, AND SOCIAL INNOVATION FOR SUSTAINABLE DEVELOPMENT GOALS

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HARMONY IN PROGRESS: INTEGRATING SCIENCE, TECHNOLOGY, AND SOCIAL INNOVATION FOR SUSTAINABLE DEVELOPMENT GOALS

Universiti Teknologi MARA CAwangan Negeri Sembilan,
Research, Industrial Linkages, Community and Alumni Division,
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PREFACE

We are delighted to present the Negeri Sembilan International Exposition (NSIEx) & Research Symposium 2025 e-book, themed “Harmony in Progress: Integrating Science, Technology, and Social Innovation for Sustainable Development Goals”. This edition marks another significant milestone for researchers, inventors, and innovators who have devoted their time and creativity to transforming ideas into impactful products, before showcasing them at the NSIEx & Research Symposium 2025. We strongly believe that NSIEx & Research Symposium 2025 has once again fulfilled its role as a vibrant platform to spotlight outstanding innovations, inventions, and design concepts across science, technology, and the social sciences. More than just a competition, the exposition nurtures a culture of research and innovation, inspiring participation among young learners as well as established professionals. To celebrate and acknowledge the contributions of these researchers, this book brings together their work after a careful review and selection process by the editors.

We are truly inspired by the diversity and creativity of the ideas presented, and we hope that this spirit of innovation continues to flourish, driving sustainable progress in the years ahead.

Editors

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ABSTRACT

Asnaf, representing a group of Muslims in need, often face multifaceted challenges. Economic struggles can hinder their access to basic necessities, limiting their opportunities for education and healthcare. Social integration might become a challenge, leading to feelings of isolation. Additionally, limited resources and support systems can impede their ability to break the cycle of poverty, making it essential to address both immediate needs and long-term solutions to uplift the asnaf community. AsnafFinder holds great potential in addressing the challenges faced by the asnaf community. By providing a user-friendly platform, this application can facilitate efficient donation management, allowing users to contribute to the financial needs of asnaf. Incorporating educational resources and skill-building features can empower them to enhance their capabilities and break free from the constraints of poverty. Additionally, creating a supportive community within the app can foster connections, reducing the sense of isolation often experienced by those in need. By developing this app, the ability to help asnaf has become much more accessible to society and is able to encourage more people to donate and help them. Apart from local communities helping asnaf through donations, having reports in a database enables the government to monitor and manage asnaf much more efficiently. This initiative not only tackles immediate concerns but also contributes to long-term empowerment and positive societal impact. With these innovative features and widespread accessibility, this app possesses the potential to not only alleviate world poverty but also foster sustainable development and empower communities worldwide.

Keywords – asnaf, community, society

JSS003 - BAKUL *FLASHCARDS*

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ABSTRAK

Inovasi ini dijalankan untuk mengatasi masalah kefahaman dalam kalangan murid tingkatan 5 Wira. Pengkaji telah membahagikan satu kumpulan kecil. Setiap kumpulan menerima satu Bakul *Flashcards*. Kajian ini telah diselesaikan selama 4 minggu. Sampel kajian ini terdiri daripada 15 orang murid tingkatan 5 Wira tahun 2025 dari Sekolah Menengah Kebangsaan Sungai Pasir Kechil. Tinjauan awal telah dilaksanakan melalui pemerhatian tingkah laku murid semasa menjalankan PDPC dan mengadakan ujian pra kepada kumpulan sasaran. Hasil tinjauan menunjukkan murid tidak dapat menguasai fakta dan huraian bagi soalan rubrik di bahagian B dalam kertas 2. Selepas seminggu, guru mata pelajaran memperkenalkan sebuah inovasi bertajuk Bakul *Flashcards* terhadap kumpulan sasaran. Selepas itu, guru mata pelajaran mendedahkan produk inovasi ini setiap kali PDPc selama 20 minit. Keputusan ujian pos telah menunjukkan peningkatan prestasi murid dan mengubah sikap murid ekonomi. Dapatan soal selidik pula menunjukkan murid minat terhadap inovasi dan secara langsung dapat memupuk minat terhadap mata pelajaran ekonomi. Kesimpulannya, inovasi ini dapat membantu murid tingkatan 5.

Kata kunci – inovasi, Flashcards, pembelajaran

JSS004 - KIT KLUSTER SEINDAH

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ABSTRAK

Kit Kluster Seindah ialah permainan pendidikan yang diinspirasikan daripada permainan kad “Family” dan direka khas untuk membantu meningkatkan daya ingatan kanak-kanak. Permainan ini menggunakan kad pelbagai warna ceria dan ilustrasi menarik bagi merangsang minat serta tumpuan pemain. Setiap kad mengandungi elemen pembelajaran yang membantu menguatkan memori melalui aktiviti padanan dan pengelasan. Reka bentuk yang mudah difahami membolehkan ia dimainkan oleh pelbagai peringkat umur, khususnya kanak-kanak sekolah rendah. Inovasi ini bukan sahaja menyeronokkan, malah menyokong perkembangan kognitif, kemahiran berfikir, dan interaksi sosial secara kreatif.

Kata kunci – permainan, pembelajaran kanak-kanak, inovasi

JSS005 - CARD'IO

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ABSTRACT

This innovation project introduces *CARD'io*, an educational card game specifically developed to enhance pupils' mastery of the eight parts of speech in English: nouns, pronouns, verbs, adjectives, adverbs, prepositions, conjunctions, and interjections. Designed with simplicity and fun in mind, *CARD'io* transforms grammar lessons into an engaging experience through play-based learning. Pupils interact with the cards in various game modes, promoting both individual understanding and collaborative learning. This method encourages learners to apply language rules in a real-time, enjoyable setting, thus improving retention and language fluency. It aligns with the belief that language games support motivation and proficiency, as supported by Chik (2014), who highlighted that games can increase learners' engagement and make abstract language elements more tangible. Furthermore, *CARD'io* is cost-effective, easy to implement, and adaptable for different proficiency levels. By turning traditional grammar lessons into interactive gameplay, this project offers a meaningful, student-centered approach to strengthening English proficiency in schools.

Keywords – CARD'io, grammar, student-centered, game

JSS006 - MENINGKATKAN KEMAHIRAN DALAM PERTUKARAN NOMBOR KEPADA TEKS DAN SEBALIKNYA BAGI MURID PEMULIHAN MENGGUNAKAN INOVASI NUM2TEXT

Rabiyatul Aishura binti Azman, Annur Tasneem binti Mohd Azhar, Aafiya Arissa binti Hanafi, Ammar Muhammad bin Abdul Hasib Sadiqin, Ummar Muhammad bin Abdul Hasib Sadiqin, dan Abdul Hasib Sadiqin bin Adam Shukri*

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ABSTRAK

Num2Text merupakan satu cara pembelajaran yang inovatif dalam meningkatkan pemahaman murid pemulihan tahun dua memahami cara pertukaran nombor kepada tek dan sebaliknya di sekolah rendah. Inovasi ini tidak hanya bertujuan untuk meningkatkan pemahaman murid, tetapi juga membantu guru dalam meningkatkan amalan pedagogi mereka dalam mengajar cara pertukaran nombor kepada teks dan sebaliknya dengan mudah dan tepat. Dalam kajian ini, seramai 10 orang murid pemulihan Tahun dua dari Sekolah Kebangsaan Ayer Molek pada tahun 2025 telah dipilih, yang terdiri daripada enam murid perempuan dan empat murid lelaki. Masalah yang dihadapi oleh murid-murid ini adalah kesukaran dalam menentu dan menukarkan nombor kepada teks dan sebaliknya walaupun mereka telah diberi latihan menggunakan kaedah tradisional. Oleh itu, kajian ini bertujuan untuk melihat kesan pengenalan kaedah baru ini terhadap pemahaman murid. Kesemua data dikumpulkan melalui pemerhatian, ujian diagnostik dan soal selidik sebelum dianalisis secara deskriptif. Hasil analisis menunjukkan bahawa inovasi ini dapat merangsang pemikiran kreatif, kritis, dan inovatif murid-murid melalui elemen kreativiti yang diperkenalkan. Pelaksanaan inovasi ini juga memberikan impak positif terhadap peningkatan keberkesanan pengajaran dan pembelajaran yang berpusatkan murid, selain memastikan isi kandungan pembelajaran dapat dikuasai. Ini menunjukkan bahawa pendekatan baru inovasi Num2Text tidak hanya memberikan alternatif yang berkesan dalam pengajaran, tetapi juga dapat memperkaya pengalaman pembelajaran murid dan meningkatkan prestasi mereka dalam topik yang rumit seperti kenali nombor dan tulis nombor dalam perkataan dan sebaliknya.

Kata kunci – kemahiran, pertukaran, nombor bulat, teks

JSS007 - EKO-BEG

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ABSTRAK

Eko-Bag merupakan sebuah inovasi yang digunakan oleh guru Ekonomi kepada murid tingkatan 4 Persona berusaha dalam tajuk permintaan dan panawaran untuk mengatasi masalah kefahaman dan pengetahuan murid. Inovasi tersebut dicipta oleh 5 orang murid dari Sekolah Menengah Kebangsaan Sungai Pasir Kechil, seorang murid dari Sekolah Menengah Kebangsaan Khir Johari, Sungai Petani, Kedah. SMKSPK telah mengadakan satu program iaitu jalinan dan jaringan bersama dengan kedua-dua buah sekolah dalam inovasi tersebut. Kajian ini telah diselesaikan selama 6 minggu. Sampel kajian ini terdiri daripada 25 orang murid tingkatan 4 Persona tahun 2025 dari Sekolah Menengah Kebangsaan Sungai Pasir Kechil. Tinjauan awal telah dilaksanakan melalui pemerhatian tingkah laku murid semasa menjalankan PDPC dan mengadakan ujian pra kepada kumpulan sasaran. Guru mata pelajaran mendedahkan produk inovasi ini setiap kali PDP selama 30 minit. Keputusan ujian pos telah menunjukkan peningkatan prestasi murid dan mengubah sikap murid ekonomi. Dapatan soal selidik pula menunjukkan murid minat terhadap inovasi dan secara langsung dapat memupuk minat terhadap mata pelajaran ekonomi. Kesimpulannya, inovasi ini dapat membantu murid tingkatan 4 Persona.

Kata kunci – Eko-Beg, inovasi, ekonomi

JST001 - ELECTROMAGNETIC ELECTROSTATIC SEGREGATION SYSTEM (EMES)

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ABSTRACT

The world produces approximately 2.24 billion tons of solid waste annually, with 33% not properly managed and 50% of household waste consists of recyclable waste. While recycling is essential for sustainability, waste segregation ensures recycling efforts are effective. We aimed to create a segregation system using the electrostatic field and electromagnetic field in one machine with an AI (artificial intelligence) system for automation to distribute the waste for segregation. It is powered by solar energy. Data was collected to investigate the efficiency of EMES versus manual segregation and to investigate the quality of segregation in EMES. We found the EMES segregation system has a fixed time of 80 seconds for segregation of the waste materials in all 10 trials. EMES is 100 % consistent (no variability). In manual segregation, time varies across trials (ranging from 250 to 600 seconds) with a mean time of 361.8 seconds and 4.4x longer than EMES with $p < 0.001$. The quality of segregation was significantly better for metal waste by electromagnetic field as compared to non-metal waste using electrostatic field ($p < 0.05$). The electromagnetic field had lower contamination (20% vs. 50%). The EMES segregation system was faster and more efficient, while Electromagnetic Field produced high quality segregation. This precision is significantly important in industrial waste segregation settings.

Keywords – Recyclable, Non-recyclable, Electrostatic, Electromagnetic

JST002 - CARICA ALUM

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ABSTRAK

Demam denggi berdarah adalah penyakit yang disebabkan oleh nyamuk Aedes aegypti dengan jangkitan virus yang memasuki saluran darah manusia melalui gigitan. Pencegahan penularan demam denggi boleh dilakukan dengan memutuskan rantaian penularan melalui kawalan larva. Kajian ini bertujuan untuk mengenal pasti keberkesanan inovasi CARICA ALUM yang dihasilkan. Inovasi ini menggunakan campuran 2 bahan utama iaitu serbuk biji betik dan tawas dalam mengawal pembiakan jentik-jentik nyamuk Aedes aegypti. Penyelidikan yang dijalankan ialah melalui kaedah eksperimen. Sampel dalam kajian ini ialah 20 ekor jentik-jentik nyamuk Aedes aegypti yang dicampur dengan serbuk biji betik dan tawas dengan dos 1 gram serbuk biji betik, 0.5 gram tawas dan 2 gram serbuk biji betik, 1 gram tawas dan 3 gram serbuk biji betik, 1.5 gram tawas. Proses ini dilakukan dengan 3 kali ulangan selama 24 jam. Hasil kajian menunjukkan semakin tinggi dos serbuk biji betik dan tawas dimasukkan ke dalam sampel, semakin banyak jentik-jentik yang mati. Ini kerana jentik-jentik terdedah kepada serbuk biji betik yang mengandungi sebatian kimia dan sebatian aktif seperti alkaloid carpain, tanin, flavonoid dan saponin. Penggunaan tawas pula berperanan penting dalam proses pembersihan air, agar tidak menyebabkan kekeruhan yang ketara dan tidak mengurangkan kualiti air. Selain itu, tawas juga berfungsi dalam kematian jentik-jentik Aedes aegypti kerana ia dapat mengurangkan pH air tersebut. Kesimpulan dari kajian ini, inovasi CARICA ALUM amat berkesan dalam membunuh jentik-jentik nyamuk Aedes aegypti serta boleh disyorkan dalam mengawal vektor demam denggi berdarah.

Kata kunci – tawas, biji betik, nyamuk Aedes, lestari, deman denggi

JST003 - LAVA LAMP

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ABSTRACT

The lava lamp can be used when our house has no electricity. The lava lamp science project hypothesis talks about the density of liquids and the solubility of two liquids which we combine in the project. Moreover, in the lava lamp, liquids are close to each other in density that do not dissolve to each other. However, the acid reacts with baking soda, producing bubbles of carbon dioxide gas that mixed with vinegar solution which are less dense than the oil rise. The lava lamp experiment works on the principle of density and polarity. Many people often end up using oil and water because they are insoluble in each other. but two liquids have densities that are very different from one another. Therefore, it is required to find two liquids with very close densities for the experiment to work. As a result of the experiment, the two liquids stick to the water droplets. The water and gas combination is less dense than the oil, and hence they rise to the top of the flask. The real lava lamps use polar and non-polar liquids, just like polarity. In conclusion, initially, the lava lamps were unusual and luxurious items, but over the time, they have become accessorized products.

Keywords – lava lamp, experiment, density

JST004 - BLATTARIA PESTICIDE

Wan Nur Amani Insyirah Binti Wan Hamat Amizi, Iman Mirza Binti Azman, Nur Adleen Dania Binti Mohd Zaidi, Nurliyana Syahida Binti Romziman, Nur Amira Izzati Binti Aneefuazmi, and Mohd Zaidi Bin Mat*

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ABSTRACT

Cockroaches are generalized insects with a few special adaptations, and may be among the most primitive living Neopteran insects. They are particularly known to be fond of starches, sweets, greasy food and meats. Easy sources of food will draw them in places like dirty dishes in the sink, pet food on the floor, or food crumbs. Cockroaches feed upon decaying organic matter, leaf litter and wood around it. Not only do they help "clean up" degrading plant material, in the process their bodies trap a lot of atmospheric nitrogen. The objective our product is made to kill cockroaches without using any energy and to reduce the number of cockroaches. To make the product, pour 10 grams of gelatine powder, 250 grams of baking soda and sugar into a bowl. Mix well. Pour 1.5 litre of water in a pan. Mix the ingredients inside the pan. Boil the mixed ingredients to activate the gelatine powder. Turn off the stove. Let it rest until room temperature. Once it cooled down, pour the mixture in a mould or a bowl. As a result, after the pesticide has been put into a test, the number of cockroaches in the tested house has been decreased. In conclusion, Blattaria Pesticide is more effective compared to the normal bug sprays. Other than keeping the house clean, the uses of Blattaria Pesticide can likely overcome the fear of cockroaches. It has minimal smell and won't give any bad side effect even if the users smelled it for a long time. The product doesn't have any bad smell that cause discomfort towards users/buyers. Blattaria Pesticide contains baking soda that creates carbon dioxide when put in contact with water. So when the coackroaches eat it, it kills them. This happens because cockroaches have rigid shells and no internal system to release gas. In addition, having sugar as one of the ingredients can attract cockroaches because of the sweet scent and taste of sugar since they have a strong preference for sweet substances and are known to be drawn to sugary foods and beverages.

Keywords – cockroach , pesticide , jelly

JST005 - MAHERIAN ICE CREAM

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ABSTRAK

Aiskrim Maherian adalah ciptaan yang berbentuk makanan yang boleh dimakan setiap hari yang diilhamkan daripada "aiskrim Malaysia". Bahan utama dalam aiskrim Maherian ialah *psyllium*. *Psyllium*, atau juga dikenali sebagai *ispaghula*, adalah nama biasa yang digunakan untuk beberapa ahli genius tumbuhan Plantago yang benihnya digunakan secara komersial untuk pengeluaran lendir. *Psyllium* digunakan terutamanya sebagai serat makanan untuk melegakan gejala sembelit dan cirit-birit ringan, dan kadang-kadang sebagai pemekat makanan. Sembelit memberi kesan kepada majoriti penduduk dunia pada masa kini. Masalah ini timbul akibat daripada diet yang tidak seimbang dalam pengambilan makanan penduduk. Majoriti makanan yang diambil setiap hari mengandungi kurang sayur atau tidak cukup serat. Ini adalah punca utama sembelit. Objektif utama produk ini adalah untuk mengatasi masalah sembelit dan seterusnya mengawal masalah buasir dan juga kanser usus. Penyediaan bermula dengan menambah 6 sudu *psyllium* ke dalam 1 liter air. Kemudian teruskan menunggu selama 10 minit. Selepas ia menjadi bertekstur jeli, masukkan gula dan campurkan dengan sirap berperisa ros. Seterusnya, campurkan jeli perisa yang dipilih dengan teliti. Hasil menggunakan satu liter air boleh dijadikan 20 batang aiskrim Maherian. Biarkan di dalam peti sejuk selama 2 jam, kemudian boleh dinikmati atau dijual dengan segera. Hasil dari eksperimen ini, masalah sembelit boleh dielakkan daripada berlaku. Kesimpulannya, aiskrim Maherian adalah penyelesaian mudah untuk semua orang terutamanya pelajar yang menghadapi masalah tidak berminat mengambil sayur-sayuran sebagai salah satu hidangan harian. Selain rasa krim yang lazat, fobia ke tandas boleh juga diatasi.

Kata kunci – masalah sembelit, aiskrim, Psyllium

JST006 - BEST TINY VACUUM

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ABSTRACT

When carrying out cleaning activities, sometimes dust and dirt often get scattered when sweeping. This condition will become worse when the weather is windy and makes the house become dusty more quickly. This will certainly make cleaning the house takes a longer time, because you have to collect all the scattered dust so that the house looks clean. Using a vacuum cleaner will help you clean dirt and dust at home without worrying about it flying around. The dust and dirt that is sucked in will be collected in the device's disposal tank. You just have to clean the tank regularly every time you finish cleaning the house. Our product is made from recycled cans so as not to pollute the environment. To make the product, cut the lid of the can with a can cutter, The base of the drink can is sharpened using sandpaper until it comes off, then measure the cable tie according to the circumference of the can. Then attach the cable tie with the net using a glue gun. Insert the cable tie into the can. After that, cut a place to place the switch on the body of the can. Connect the switch wire to the battery and motor wires to enable the vacuum to work. Use the other can to draw two outer and inner circles to make the fan. Then the finished fan is connected to the gear using glue gun, then insert it into the vacuum body. Measure and cut the lid of the medicine bottle to be used as the face of the vacuum. Attach the tin ring and the net to the vacuum base. Make a vacuum handle using an ice cream stick and attach it using a glue gun to the vacuum body. Finally, decorate and test the vacuum. In conclusion, our product works perfectly to reduce allergies and asthma because they can suck dust in the environment effectively.

Keywords – dust vacuum, tiny, cleaning

JST007 - TEENATURE BIO-PLASTIC

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ABSTRACT

Plastic waste is known to pollute the earth environment in many ways. This is because most plastic is not recyclable, and therefore, is mostly not biodegradable. Hence, there is a pressing need to find a practical solution to this challenge. In this project, TEENATURE brings you a bio-plastic invention, where chemistry meets plastic that is potentially biodegradable. TEENATURE bio-plastic will be created using a mixture of water, shrimp shell, agar-agar powder. As to make it more flexible, glycerol will be used in the process. We aim to create a new bio-plastic material that is biodegradable as the foundation to make common plastic products. In order to make the product, we will set up an experiment using raw materials consisting of shrimp shell, water, agar-agar powder and glycerol. Stocks of shell of raw shrimps will be collected and mixed. This shrimp shell will then be soaked in the salt water, and later be dried before blended together. Then, we will add the blended shrimp shell into the water and filter the remaining shrimp skin water until it becomes a well-mixed water. Next, in the mixing bowl, combine the agar-agar powder with the water. Mix thoroughly to form a homogenous mixture and let the mixture sit for about 15 to 20 minutes to allow the agar-agar to hydrate fully. Pour the agar-agar mixture to a pot. Heat it over low to medium heat while stirring constantly, continue heating until the mixture thickens and becomes clear. To make the bio-plastic more elastic, add 5 grams of glycerol to the hot mixture. Allow the bio-plastic to cool and solidify and later carefully remove it from the mold. As a result, we are able to create a new bio-plastic material that can be molded to create common bio-plastic products such as plastic bag, spoon and fork, plates, etc. In conclusion, TEENATURE presents is an invention of bio-plastic that is more nature-friendly as the foundation to create biodegradable bio-plastic products that we could use daily. We hope that this bio- plastic invention brings various other benefits in our efforts to tackle current plastic pollution.

Keywords – environment, biodegradable, bio-plastic

JST008 - NAMNAM HEALTHY CUPCAKES

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ABSTRACT

NamNam Healthy Cupcakes is in the same form as other cupcakes but we put a secret ingredient which is namnam fruit that contains various benefits and can prevent from chronic diseases. The main ingredients in these cupcakes are cake flour, namnam fruits, milk, eggs, stevia, lemon, dark chocolate and butter. We also used sprinkles for the decorations. With the availability of this food, children are no longer afraid to take medicine. Hence, the cost of purchasing expensive medicine can be avoided. There are approximately 100 calories in 1 unit of cupcake. The objective of this product is to help people who wants to prevent chronic diseases without wanting to take expensive medicines which could taste quite bad. To produce the cupcake, break the eggs. Separate the egg yolks from the egg whites. Melt the butter. Put the melted butter in a bowl. Put the milk in the butter. Stir until combined. Sift the cake flour. Stir until combined. Add the egg yolks to the mixture. Stir again until well mixed. Cut a lemon in half. Squeeze the lemon to get the lemon juice. Put the egg whites in another bowl. Drop a teaspoon of the lemon juice. Put four drops of stevia. Stir the mixture using a mixer. Put the mixture that has been made to the egg white mixed with lemon and stevia. Mix until combined. Cut the namnam fruit. Slice the namnam fruit into small pieces. Put the mixture into the mold then put the namnam fruit into the mixture. Put the mixture in the air fryer and bake for 35 minutes at 130 temperature. After baking, remove the cupcake from the air fryer. Leave the cupcake to cool down for awhile. After that, heat the dark chocolate and pour it on the cupcake, then decorate with sprinkles. As a result, the population of people suffering from chronic diseases decreased due to adopting this food gradually. In conclusion, the NamNam Healthy Cupcake is a solution for everyone especially for people who cannot afford expensive medicines.

Keywords – Namnam fruit, cupcake, healthy

JST009 - GRYMMY GUMMY

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ABSTRACT

The Grymmy Gummy is a sour, slightly sweet gummy that helps take away the searing fiery taste in our mouth. Because lemons are acidic fruits that can take the edge off of spice, we employed their flavor. Both children and adults will enjoy this gummy. People who don't consume spicy food find it intolerable; thus, this gummy can assist them get rid of the spicy flavor. Normal gummy can also somewhat ease the burn in our mouths, but not completely. The objective of this product is to help people who can't handle spice when they eat spicy food. To make the product, add 2 tablespoon unflavored gelatin into a bowl. Then, add half cup of warm water and mix it well. Add gelatin into the pot that was filled with sugar syrup and cook for 5 minutes. Add lemonade into the pot and then cook for 5 to 10 minutes. Stir occasionally and in the meantime the mold is being prepared. Pour the mixture into the mold. Keep in the fridge for 3 to 4 hours and later coat them in sugar. As a result, people will not be scared anymore to eat spicy food because of the Grymmy Gummy. In conclusion, our research and information from the internet indicate that those who are unable to handle spicy situations develop a phobia of spicy food. They may also experience stomach pain after eating spicy meals. They will make an effort to find anything that will eliminate the spice. In addition, children today like to eat unhealthy gummies. We made the Grymmy Gummy in order to promote wellness in both children and adults. It's believed that this gummy will draw in both adults and children in addition to being inexpensive, simple to manufacture, and tasty.

Keywords – gummy, phobia, wellness

JST010 - HEALTHY KONJAC

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ABSTRACT

Healthy Konjac is made from pegaga leaves (Centella Asiatica) and green apple. This invention is very healthy as it is organic and they are made of natural plant. The objective of our product is to encourage children to eat vegetables. First step, take a handful of pegaga leaves and blend with 150ml of water then filter. Then, cut 3 apples into small pieces and blend with 250ml of water then filter. Add 10 tablespoons of jelly together with 150ml of water and heat until it boils for 5 minutes. Mix the jelly solution with pegaga leaves, apple and a drop of food coloring. Put it in the mold and cool in the fridge for 1 hour and dry it. Then, roll it in caster sugar. In conclusion, our product works perfectly and very effective to encourage children to eat vegetables and it contains many benefits. Healthy Konjac also good for children and all general levels. This product is easy to consume and easy to carry anywhere.

Keywords – natural, delicious, healthy

JST011 - PARKIA SPECIOSA HASSK (PETAI) AS A MOSQUITO EXTERMINATOR AND MOSQUITO BITE MEDICINE

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ABSTRACT

This research was conducted to test the effectiveness of petai skin in killing dengue-causing mosquitoes and in healing heal insect bites. 100 grams of petai skins were dried, crushed into powder, and soaked in 120 millilitres of 96% ethanol for three hours. The ethanol was then evaporated, leaving behind the extract of the petai skin. This extract was divided into two portions; one was used to develop the mosquito insecticide, and the other was used as a treatment for insect bites. The portion for bite treatment was mixed with coconut oil as a base to form a cream. The portion for insecticides testing was mixed with water in three different concentrations; [A] 2.5 ml in 50 ml water (5% concentrate) [B] 5 ml in 50 ml water (9.09% concentrate) and [C] 7.5 ml in 50 ml water (13% concentrate). Each solution was tested by putting it in an electric mosquito exterminator and placed inside a box with 25 mosquitoes for 24 hours. The cream was tested by applying it to inflamed skin. After 24 hours, the 9.09% concentration was found to be the most effective in exterminating mosquitoes. While the 13% concentration did kill the most mosquitoes, the difference compared to the 9.09% concentration was negligible. As such, the 9.09% concentration of petai skin extract is considered effective in exterminating mosquitoes. The mosquito bite cream was tested on a mosquito bite, and the subject reported rapid relied of itchiness, and a quick reduction in swelling and redness. These effects are likely due to the content of flavonoids, saponins and phenolic compounds in the petai skin, as supported in numerous studies prior where petai skin can be used to exterminate mosquitoes and to treat mosquito bites.

Keywords – Delicious, smelly, nutritious, medicine

JST012 - MEDICINE DISPENSER

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ABSTRACT

The Medicine Dispenser is an innovative healthcare device inspired by the beverage vending machines commonly seen everywhere. This advanced dispenser holds immense potential to revolutionize the delivery of personalized healthcare. This device can analyze medication usage patterns and provide personalized recommendations tailored to individual patient needs. To upgrade healthcare innovation through the creation of a prototype medicine dispenser. The process began by preparing six pieces of cardboard for the top and base structure,along with smaller pieces for the medicines compartment. Next, all the cardboard was wrapped in aluminium foil, assembled, and glued together. A mockup of medicines was paced in the interior compartments. An old smartphone screen was then attached to serve as a touchscreen interface for symptom input and drug selection. A slot was created to represent the cash input, along with an opening at the bottom for dispensing medicines. A plastic cover was added in front of the compartments, and a Light Emitting Diode (LED) was installed to illuminate the interior. This machine is designed to save time and improve accessibility, particularly for busy individuals. Moreover, this innovation will also help us to improve the environment by reducing gas emissions if implemented globally. Overall, it offers significant benefits for both people and the environment.

Keywords – medicine, health, machine

JST013 - PERMANENT SOLUTION

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ABSTRACT

PERMANENT SOLUTION that is made from BILIMBI (or Averrhoa bilimbi, the scientific name of the fruit) is an invention designed to address the problem of adhesive residue left by tapes on surfaces. This organic cleaner effectively removes dirty and unpleasant glue stains from floors and surrounding areas. Rubber-like residues in the environment can come from many sources, including human and industrial activities. Unlike chemical cleaners, this invention is safe as it is purely plant-based. It is made from natural ingredients, which can sometimes substitute for any dense and fibrous plant material. To use, simply pour the bilimbi solution into a spray bottle, container, or prepare sachets filled with the liquid. When applied, the unwanted adhesive residue will be removed. PERMANENT SOLUTION works as an effective remover of glue and sticky residues on various surfaces. As a result, the rubbery and sticky effects on valuable objects or floors will disappear, leaving behind a smooth, non-sticky surface. Furthermore, this natural fluid is odorless, environmentally friendly, and safe for everyday use.

Keywords – Bilimbi organic solution

JST014 - SMARTBOARD

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ABSTRACT

Smart Board is a simple yet effective template board to make learning easier and more organised. It is an invention created to assist stuents who struggle with studying and lack effective study methods. This board is made from cardboard, which is both easily accessible and suitable for basic handcrafting skills. Its purpose is to help users organise schedules, thereby reducing stress related to homework and exams. To create the Smart Board, the process begins with planning the layout and sketching designated spaces for study materials. The board cover is then added, and the cardboard pieces are glued together to make the structure firm and durable. Next, the sketched parts are cut out to form compartments, and a third layer of cardboard is glued to complete the board. For organization and aesthetics, planners and decorative elements can be attached. Once finished, the Smart Board is ready for use. This invention serves as a clean, practical, and multifunctional tool for organising study activities. Overall, the Smart Board is highly effective, helping students enjoy and even romanticize the study process in a more engaging way.

Keywords – Better methods, better grades, better mentality.

JST015 - NUTRICIOUS GUMMY

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ABSTRACT

NUTRICIOUS GUMMY is made from stevia, gelatine, green apple, and natural food colouring. Nowadays, social media strongly influences the eating habits of children and teenagers. To maintain good health, it is important to monitor daily food intake and prevent future health risks. This product is safe, health-conscious, and supports the development of a healthier lifestyle. To prepare nutricious gummy, green apples are washed, cut, and blended into a liquid paste. The paste is strained to obtain pure apple juice, which is then mixed with natural green food colouring. One drop of stevia is added, followed by gelatin, which is stirred until dissolved. The mixture is heated until it begins to bubble, then poured into moulds and refrigerated. After several hours, once solidified, the gummies are ready to be consumed. Nutritious Gummy is a high quality product invented to help regulate sugar levels in the body. It provides a healthier alternative for children, especially those who struggle to control their daily sugar intake. By offering a natural, low-sugar option, this product may also help reduce the risk of diabetes-related complications.

Keywords – healthy body, fit mind.

JST016 - LABIO DULCE

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ABSTRAK

LABIO DULCE ialah serum yang dapat merawat bibir kering, merekah, dan gelap. Produk ini mengandungi lebih daripada satu jenis vitamin E dan vitamin C, yang juga merupakan bahan utama dalam formulasi ini. Objektif utama produk ini adalah untuk memperkenalkan penyelesaian bagi mereka yang mengalami masalah bibir merekah, kering, dan gelap. Sesuai untuk wanita, produk ini bukan sahaja melembapkan, malah memberikan warna pigmen yang sesuai untuk solekan. Ucapkan selamat tinggal kepada bibir kering dan nikmati bibir yang lebih sihat serta segar dengan kelebihan tambahan sebagai produk solekan. Untuk menghasilkan produk ini, cairkan lebah madu (beeswax), mentega koko (cocoa butter), dan minyak badam manis (sweet almond oil) dalam mangkuk tahan panas menggunakan teknik *double boiler* sehingga semuanya larut sepenuhnya. Setelah bahan cair sepenuhnya, tambahkan minyak jojoba, vitamin E, vitamin C, madu, dan ekstrak lidah buaya ke dalam campuran tersebut. Kacau dengan baik dan tambahkan bahan pengawet untuk memastikan serum kekal segar serta bebas daripada pertumbuhan bakteria. Matikan api dan biarkan campuran sejuk sedikit sebelum menuangkannya ke dalam bekas. Setelah mengeras, ianya boleh ditutup dan sedia untuk digunakan. LABIO DULCE dapat membantu menyembuhkan bibir yang merekah. Labio Dulce diformulasikan dengan bahan semula jadi seperti lebah madu, madu, minyak jojoba, minyak badam manis, dan mentega koko, yang masing-masing memberikan manfaat unik untuk penjagaan bibir. Lebah madu memberikan kelembapan dan kelembutan, namun penggunaan berlebihan boleh menyebabkan rasa berat pada bibir. Minyak jojoba ringan dan mudah diserap, tetapi mungkin menyebabkan reaksi kulit pada sesetengah individu. Minyak badam manis kaya dengan vitamin E, yang baik untuk kesihatan bibir, tetapi berisiko bagi mereka yang alergi terhadap kacang. Madu menambahkan kelembapan semula jadi dan sifat antibakteria, namun boleh mencetuskan alahan pada individu tertentu.

Kata kunci – bibir sihat, serum, lebah madu

JST017 - CHROMO CREAM

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ABSTRACT

Chromo Cream is made from plane leaves which has the scientific name of Chromolaena Odorata, olive oil, rose oil, aloevera and beeswax. Chromolaena odorata, commonly known as Siamese weed or bitter bush, has long been recognized for its medicinal properties, especially in traditional herbal medicine. Extracts from this plant have been used to treat a variety of ailments, including skin conditions, inflammation and wounds. Chromo Cream is a product that can solve problems such as itchy skin problems, rashes, relieve bloating, stop bleeding, used by mothers after childbirth and heal wounds. These medical prblems can cause discomfort and inconveniences to the people who has it. For example, continuous bleeding that cannot be stopped will cause a person to lose blood. Flatulence occurs when the digestion process is not smooth and itchy skin problems like eczema could be faced by people of all ages. To make the product, the first step is to weigh all the needed ingredients. The second step is to mix 14 grams of bees wax, 86 grams of olive oil into a container using the double boil method. The third step is to blend 20 grams of plane leaves, 30 grams aloevera and 2 grams of rose oil until crushed. The last step is to mix the boiled ingredients and the ground ingredients until they are well blended. Finally put it in the container. The Chromo Cream can be used for all ages. It is halal and according to shariah, easy to carry anywhere, can heal wounds, does not contain harmful chemicals and also affordable. The effect of using Chromo Cream is that wounds heal quickly. Although further research is needed to fully understand its mechanism and optimize its formulation, existing evidence suggests that Chromo Cream holds significant promise as a natural and effective option for skin care. As interest in herbal medicine continues to grow, Chromo Cream may emerge as a valuable addition to the range of treatments available to promote skin health and healing.

Keywords – traditional herbs, Chromolaena Odorata, skin problem

JST018 - E-BROOM

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ABSTRACT

E-broom is a small and portable electric broom that is designed to clean wide range for a faster more efficient time saving. The size of E-broom makes it easier to store and hold. E-brooms can effectively pick up dust, dirt, pet hair, and allergens. objective: e-broom is designed to clean a wide range for a faster more efficient time saving, promoting a healthier living environment, especially for individuals with allergies and asthma. To produce the product, cut the chopstick with a length of 16cm. Cut the chopstick in half about halfway. Then, cut the raffia rope into many pieces and stick the raffia rope between the chopstick. Tie the chopstick and glue the top of two bottle caps and stick both of it together. Drill a hole in the middle of the bottle cap and stick the chopstick in the hole. Cut the cardboards into same size and drill a hole on the cardboards. Put a straw in the hole. Cut some cardboard and a sheet of hard paper. Stick the hard paper on the cardboard and stick all of the cardboard together to form the base of a vacuum cleaner. Put the chopstick in the hole and put a motor in the box and connect it to the bottle cap. Cut some cardboard to make the handle. Make a hole for the button. Connect the button with a battery and stick the handle to the box, and lastly connect the battery to motor.

Keywords – broom, cleaning, efficient

JST019 - ORGANIC BATHBOMB

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ABSTRACT

Organic BathBomb is a body care product. The main ingredient is Prunus Persica or the famous name is Flower Peach Tea. It contains many benefits such as suitable for sensitive skin, could reduce enzyme and many more. The objective of this product is to help people with sensitive skin, people that suffers from eczema and people that have skin disease. To make the product, first of all combine 1kg organic baking soda , 500g citric acid and 100g add sum salt into the bowl. After that , add 10g of bentonic clay into the bowl and stir it. After it is fully mixed, the mixture should be brighter, then we can put it in the mold. Lastly, after the bathbomb is completed, rest it for one day to make the bathbomb become more solid. As a result, the skin will be softer after using the bathbomb and it can make your skin healthier. It could also reduce any skin disease. In conclusion, the Organic Bathbomb is safe to use for all skin type and it doesn't give bad effect to human or the environment.

Keywords – bathbomb, organic, sensitive skin

JST020 - ACEMANNAN

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ABSTRACT

Acemannan is an innovation from the common aloe vera gel which is marketed in common stores. This advanced product is rich with many benefits since it is a combination of aloe vera, rose water, and oils (argan oil, coconut oil, & vitamin E). This product can help person with skin and hair problems to feel better about themselves. The objective of this product is to make sure that people with skin and hair problems, especially students, don't feel insecure with themselves. To make the product, start by boiling rose petals to create rose water. After the rose water is done, scoop out aloe vera gel and clean it carefully. Mix 2 tablespoons of aloe vera gel and 3 to 4 drops of rose water. Next mix in 1 tablespoon of organ oil. After that, put in 1 tablespoon of coconut oil and 1 tablespoon of vitamin E in a clean container together. Mix it all until it becomes a paste. Transfer to a container. As a result, this product can help people with skin problems to get rid of the factors that cause skin breakouts such as spots and marks from acne and pimples and remove dark circles. In conclusion, this product will help a lot of people, specifically people with skin and hair problems.

Keywords – aloe vera, skin problem, hair problem

JST021 - MIRACLE CANDY

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ABSTRACT

MIRACLE CANDY that is made from Miracle Fruit (*Synsepalum dulficum*) is an invention to address the problem of taste bitter and sour. It can remove all the taste of bitter and sour. There are lots of bitter and sour fruits around us that rarely touch even though it gives lots of benefits from a medical perspective. In addition, this invention will not harm anyone as it is organic. They are made from natural plants, or they can sometimes substitute for any dense and fibrous plant material. The primary objective of this study is to remove the taste of sour and bitter. Results show that the unwanted taste of sour and bitter will be excluded and only sweetness will be tasted even though a bitter or sour fruit has been consumed. In conclusion, MIRACLE CANDY is very effective to eliminate the sour and bitter taste in lemon and bitter gourd. This candy is safe for daily consumption.

Keywords – unappetising food, sweetness

JST022 - WHITE GOLD

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ABSTRACT

WHITE GOLD, made from single clove garlic(*Allium sativum*), is an innovative health product developed to address the growing issues of high cholesterol and heart disease in society. It works by helping to reduce bad cholesterol in the body while being entirely organic and safe for consumption. The preparation process involves soaking peeled single clove garlic in honey, or fermenting unpeeled garlic. This method significantly reduces its spiciness and unpleasant odour, especially on the breath. For added nutritional value and improved taste, the garlic can be coated with nuts such as peanuts, pistachios, or cashews. Regular consumption of WHITE GOLD may boost the immune system, lower cholesterol levels, and promote heart health. With WHITE GOLD, concerns about strong garlic breath and excessive spiciness are eliminated. It is a natural, affordable, and nutritious solution to support a healthier lifestyle.

Keywords – Times at fingertips

JST023 - ZEN FOCUS CHEWS

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ABSTRACT

Zen Focus Chews are an innovative gummy supplement that combines B vitamins and Rhodiola Rosea to improve energy, mental focus, and stress management. This product is designed to help overcome mental and physical fatigue and provide a practical solution for the daily needs of energy, focus, and calmness. The main objectives are to increase energy, mental focus, reduce stress and practical and delicious solutions. Zen Focus Chews are made with the following steps: Mix gelatin or gelatin with air, heat until dissolved. Add vitamin B complex and Rhodiola Rosea extract to the mixture. Stir until combined. Add sweeteners, flavorings, and natural coloring if needed. Pour into a mold and chill in the fridge. Once hardened, remove from the mold and store in an airtight container.This process produces a gummy supplement that is effective for increasing energy, mental focus, and managing stress. It will boost energy where users feel more energized throughout the day. It also improves mental focus by increasing concentration and ability to stay focused. Furthermore, it helps users feel more at ease in challenging situations and receives favorable feedback for its pleasant taste and convenient consumption. In conclusion, Zen Focus Chews are an effective solution for energy, mental focus, and stress management. This product helps overcome mental and physical fatigue and reduce stress levels with a combination of B-vitamins and adaptogens. In a practical and tasty gummy form, this product facilitates integration into the user's daily routine.

Keywords – Times at fingertips

JST024 - ANTI RUST SOAP

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ABSTRACT

Anti Rust Soap is a soap that allows you to remove dirt from rusted clothes, because the world now has a lot of rusty water. Most people throw their rusted clothes away, we can see that they have wasted their clothes. The main objective of this product is to overcome rusty things, and to overcome the rusty water that gets on the clothes. This product is safe to consume by humans and easy to carry anywhere. The preparation method begins by heating a pan. Next, add the soap and allow it to melt completely. Then, stir in two to three spoonfuls of lemon juice. Finally, let the mixture boil, and once ready, pour it into a mold to set. This Anti Rust Soap successfully removes rust water stains that are attached to clothes. In conclusion, this Anti Rust Soap is and can be sold to others, can attract people's attention and be useful for the future.

Keywords – Giving many benefit, Usefull, Adorable

JST025 - RELIEF ECZEMA GELENGGANG NATURAL SOAP (REGNS)

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ABSTRACT

This study explores the development of a natural soap infused with gelenggang leaves, known for their medicinal properties in treating eczema. Offering a plant-based, chemical-free alternative, this soap helps reduce itching, inflammation, and scarring while promoting skin healing. Its eco-friendly production process makes it a sustainable choice for individuals with eczema, sensitive skin, or those seeking natural skincare solutions. The main objective of this product is to treat eczema and remove scars. To prepare this product, gelenggang leaves are washed, ground, and filtered to extract their liquid. Separately, sodium lauryl sulfate is mixed with salt until fully combined. The filtered leaf extract is then blended with the mixture, along with dye or fragrance if desired. The liquid is poured into a container and left to harden into solid soap.To use, rinse the soap with water and apply it to the affected area. Regular use soothes itching, reduces scars, and supports overall skin health. Result:This soap treats eczema, removes scars, and is safe for the skin—naturally soothing without side effects. Conclusion: Most eczema medications are factory-made rather than organic, and many people are unaware that gelenggang leaves can help treat eczema. Using these leaves as a natural remedy can reduce reliance on expensive eczema treatments while providing an effective, affordable alternative.

Keywords – Eczema treatment

JST026 - TriNum

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ABSTRAK

TriNum ialah alat pembelajaran kreatif yang menggabungkan teknologi dan elemem kraf secara teliti, khusus untuk membantu individu yang mengalami kesukaran pembelajaran, terutamanya berkaitan kemahiran pemahaman nombor. Inovasi ini menggunakan rangsangan visual melalui lampu LED dan sistem input papan kekunci yang membolehkan pengguna mengenal pasti dan menghafal jenis nombor seperti nombor genap, ganjil, dan nombor perdana. Seiring dengan perkembangan teknologi yang pesat, TriNum menawarkan pendekatan pembelajaran interaktif di mana pengguna hanya perlu menekan butang nombor, dan sistem akan menyalakan LED dengan warna tertentu mengikut kategori nombor yang dimasukkan. Pendekatan ini memberikan pengalaman pembelajaran yang menyeronokkan, mudah difahami, dan mampu menarik minat pengguna, terutamanya kanak-kanak prasekolah dan pelajar yang mengalami kesukaran memahami konsep matematik secara konvensional. Objektif utama projek ini adalah untuk menyediakan kaedah pembelajaran alternatif yang lebih mesra pengguna, berkesan, dan mudah diakses. TriNum membolehkan pengguna mengenal pasti nombor secara intuitif tanpa perlu memahami teori yang kompleks terlebih dahulu, justeru membantu membina asas pemahaman matematik yang kukuh. Dari aspek teknikal, sistem ini dibina menggunakan mikropengawal yang memproses input nombor melalui papan kekunci 4x4. LED genap menyala jika nombor tersebut boleh dibahagi dengan 2, manakala LED ganjil menyala jika tidak. Jika nombor itu adalah nombor perdana, LED perdana yang ditetapkan akan menyala. Program ini memastikan bahawa hanya satu LED diaktifkan pada satu masa, mencegah petunjuk yang salah. Setelah ujian selesai, komponen-komponen tersebut dikunci dalam sebuah bekas untuk penggunaan praktikal. Bekalan kuasa dioptimumkan untuk memastikan prestasi yang stabil. Kesimpulannya, TriNum membuktikan keberkesanan gabungan komponen perkakasan dan perisian dalam membina alat bantu pembelajaran matematik yang praktikal.Ia dengan berkesan memberikan maklum balas visual yang jelas serta berfungsi sebagai alat praktikal dan sumber pendidikan dalam elektronik asas dan pengaturcaraan.

Kata Kunci – TriNum mudahkan matematik

JST027 - MULTIPLY ME

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ABSTRAK

Multiply Me ialah kaedah inovatif untuk membantu pelajar menyelesaikan masalah matematik, khususnya dalam pendaraban, tanpa perlu bergantung pada hafalan sifir atau penggunaan kalkulator. Multiply Me adalah alternatif untuk menghafal jadual pendaraban dari nombor 6-9 tanpa perlu menghafalnya. Berasal dari kaedah Chisanbop, di mana ia adalah kompleks dan abstrak, kaedah ini telah dipermudahkan kepada kaedah Multiply-Me di mana ia adalah tepat dan mudah. Kaedah ini hanya melibatkan penggunaan jari tangan dan kaki, sekali gus menjadi kaedah yang praktikal dan percuma. Kaedah ini sesuai digunakan di kalangan pelajar sekolah rendah yang menghadapi kesukaran menghafal sifir, serta mereka juga tidak dibenarkan menggunakan kalkulator. Objektif utama kaedah ini adalah untuk memudahkan pelajar memahami dan menyelesaikan pendaraban dengan lebih pantas. Cara pengiraan adalah dengan menggunakan jari tangan dan kaki. Sebagai contoh: Untuk mendarab nombor dengan 6, gunakan 5 jari kaki anda dari kaki kiri anda dan letakkan 1 jari ke bawah untuk menjadi 6. Jari-jari yang telah diturunkan dianggap sebagai 'puluh' dan hanya perlu ditambah. Bagi jari-jari yang tinggal, mereka adalah 'satu' dan perlu diperbanyakkan. Ini bermakna terdapat 3 jari yang telah diletakkan (3 X 10 = 30). Dengan cara ini, pelajar dapat memperoleh jawapan dengan segera tanpa perlu menghafal sifir secara tradisional. Sebagai kesimpulannya, Multiply Me berpotensi menjadi kaedah alternatif yang memudahkan para pelajar menguasai cara pendaraban. Ia bukan sahaja memudahkan proses pembelajaran, malah menjadikan pelajar lebih seronok dan yakin ketika belajar matematik.

Kata kunci – Mendarab di hujung jari

JST028 - BOOST BITES

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ABSTRAK

Boost Bites ialah projek inovasi makanan yang bertujuan menghasilkan snek tenaga alternatif yang berkhasiat dengan menggunakan bahan semula jadi terpilih. Masalah utama yang dikenal pasti ialah kebanyakan snek tenaga sihat di luar sana mungkin kekurangan vitamin dan mineral penting. Oleh itu, objektif projek ini adalah mencipta snek tenaga yang lebih bernutrisi berbanding produk sedia ada di pasaran, dengan memanfaatkan bahan semula jadi yang memberikan manfaat kesihatan yang lebih baik kepada pengguna. Metodologi penyediaan melibatkan gabungan pisang kering yang dihancurkan, madu, dan oat, yang dibentuk menjadi adunan. Kemudian, kepingan pisang lebih besar diletakkan di atas adunan sebelum dibakar hingga keemasan, dan akhirnya, ia disejukkan dalam peti sejuk sebelum sedia untuk dinikmati. Dari segi kebolehpasaran, snek ini ditawarkan pada kos yang lebih rendah berbanding snek tenaga komersial, sekaligus menjadi alternatif yang mampan kepada pelanggan. Kelebihan produk ini ialah bebas daripada bahan tambahan yang berbahaya, membekalkan tenaga segera, meningkatkan tumpuan, serta menyumbang kepada kecergasan dan kesejahteraan tubuh. Kesimpulannya, Boost Bites menawarkan snek tenaga yang lebih sihat dan berkhasiat, sesuai untuk gaya hidup aktif. Dengan menggunakan bahan semula jadi, produk ini bukan sahaja memberikan tenaga dan fokus, malah turut mengekalkan kesihatan secara menyeluruh.

Kata Kunci – Snek tenaga sihat

JST029 - SINUS SOOTHE

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ABSTRACT

Sinus Soothe is a natural anti-sinus beverage made with honey, ginger, turmeric, lemon, apple cider vinegar, cinnamon, and peppermint. It helps relieve sinus symptoms, thin mucus, and strengthen the immune system while providing a soothing effect. This refreshing drink serves as a natural health alternative. The preparation begins by heating water to 70°C, followed by mixing turmeric, ginger, apple cider vinegar, and cinnamon to enhance infusion. The mixture is left to steep for 5–10 minutes, allowing the ingredients to release their beneficial properties, before adding fresh lemon juice and honey to preserve their nutrients. It can be consumed warm for a soothing effect or chilled for a refreshing alternative. Sinus Soothe is a safe, natural drink that helps relieve sinus symptoms, supports respiratory health, and serves as a refreshing alternative to conventional remedies. It's also made for everyone!

Keywords – organic, sinus relief, immunity, respiratory health

JST030 - AUTOMATIC DRY FISH FACTORY

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ABSTRACT

The development of an automated salted fish drying system significantly contributes to several Sustainable Development Goals (SDGs) by enhancing food preservation and supporting local fishing communities. This innovative tool optimizes the drying process, ensuring high-quality dried fish is available year-round, thereby promoting food security and nutrition (SDG 2: Zero Hunger). By providing fishermen with a reliable method to process their catch, the system reduces post-harvest losses and improves income stability, fostering economic resilience (SDG 8: Decent Work and Economic Growth). Additionally, the tool minimizes energy consumption and dependence on favorable weather conditions, encouraging responsible resource management in the seafood industry (SDG 12; Responsible Consumption and Production). Furthermore, the automation and efficiency of the drying process help mitigate the impacts of climate variability on fishing communities, promoting adaptive practices that enhance resilience to climate change (SDG 13: Climate Action). Overall, the implementation of this technology empowers fishermen by providing a dependable solution for fish drying, enhancing productivity and strengthening their market position. By ensuring a consistent supply of high-quality dried fish, the project supports local food systems and contributes to the well-being of fishing communities. The focus on sustainability and reduced environmental impact reinforces the commitment to preserving marine ecosystems, vital for the livelihoods of these communities. This project not only addresses immediate needs within the fishing industry but also fosters long-term sustainability and resilience, ultimately contributing to broader social and economic development goals in fishing communities.

Keywords – fish not expired, food security, SDGs

JST031 - SHOE DRYER

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ABSTRACT

The Shoes Dryer Machine is an innovative and cost-effective solution designed to address the common problem of wet, slow-drying shoes caused by rainy or humid weather. Wet shoes not only produce unpleasant odors but also promote bacterial growth, which can affect foot hygiene and comfort. This project introduces an electric shoe dryer that dries damp footwear efficiently while preventing damage to the shoe's original structure. Constructed using affordable and readily available materials, including plywood, a recycled toaster heating element, cooling fans, LED lights, and an acrylic sheet panel, the machine is designed to be both functional and environmentally sustainable. The design incorporates a heating system powered by a nichrome wire element, which generates warm air distributed throughout the chamber by strategically placed cooling fans. Shoes are placed inside a compact wooden enclosure with a transparent front door, allowing users to monitor the drying process. The machine operates with adjustable features, such as LED lighting and a USB power option, making it versatile and user-friendly. Preliminary testing demonstrated that the device significantly reduced drying time compared to air drying, eliminating musty odors and reducing bacterial growth. Its low production cost makes it an accessible household appliance, providing an affordable solution for families, particularly during the rainy season. By transforming simple, low-cost components into a practical and sustainable product, the Shoes Dryer Machine contributes to improved hygiene, comfort, and quality of life. This innovation highlights how creative engineering can address everyday challenges while emphasizing cleanliness, health, and sustainability. Its compact design, cost-efficiency, and effectiveness make it a promising addition to household appliances, ensuring that wet shoes are no longer a persistent problem.

Keywords – rainy season, shoe dryer, wet

JST032 - RICECYCLE BISCUIT (HEALTHY GRANOLA RICE BISCUITS)

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ABSTRACT

This project introduces a sustainable and innovative approach to reducing food waste by repurposing leftover cooked rice into a nutritious, sugar-free granola rice biscuit. Developed through a low-heat baking process, the product requires no preservatives or artificial additives, offering a naturally shelf-stable solution. By incorporating wholesome ingredients, the biscuits deliver essential nutrients and can be customized to suit both savory and sweet flavor profiles. This innovation addresses the growing concern of food wastage, particularly rice, which constitutes a significant portion of household waste. The final product demonstrates an extended shelf life of up to three months while maintaining quality and safety standards. By transforming simple kitchen leftovers into value-added food products, this project supports circular economy principles and promotes sustainable, wellness-oriented consumption practices.

Keywords – granola, health, leftlover

JST033 - HALAL MARSHMALLOW

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ABSTRACT

The Halal Marshmallow project introduces a healthier, halal-certified alternative to conventional marshmallows, which often contain non-halal ingredients and lack nutritional value. Many commercially available marshmallows raise concerns among consumers regarding halal status and health implications, especially for children. This innovation addresses these issues by incorporating fresh strawberries as a natural source of nutrients and flavor, thereby enhancing both the quality and trustworthiness of the product. The marshmallow was developed using a simple and cost-effective process. Fresh strawberries were blended with natural gelatin, sugar, and water, then subjected to a controlled heating and mixing process. The mixture was allowed to set under optimal conditions to achieve a soft, chewy texture without the use of artificial additives. This streamlined method ensures that the product remains safe, nutritious, and easy to reproduce on a larger scale. Preliminary evaluations indicated that the Halal Marshmallow offers several benefits. The inclusion of strawberries provides vitamin C, flavonoids, phenolic compounds, phytochemicals, and ellagic acid, all of which contribute to antioxidant activity and general health improvement. While the product contains sugar, the fruit content offers added nutritional value and helps address community concerns about consuming processed sweets with unknown ingredients. In conclusion, the Halal Marshmallow represents a novel approach to producing a snack that is both halal and health-conscious. By combining fruit-based ingredients with clear halal certification, this innovation reduces consumer uncertainty and promotes better dietary choices. Its simplicity, affordability, and potential health benefits make it a promising addition to the market, particularly for families seeking safe and nutritious snack options.

Keywords – halal, mashmallow, nutritional, strawberries

JST034 - VITAPUC DELUXE

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ABSTRACT

This project introduces an innovative approach to promoting healthy eating by transforming fruits and vegetables into sugar-free jelly lollipops. Many children and even adults tend to avoid fruits and vegetables due to their bitter or sour taste, resulting in food wastage and reduced nutritional intake. This innovation addresses these issues by combining natural fruits and vegetables with a sugar-free sweet base, creating an appealing and enjoyable alternative that encourages healthier snacking habits. The product is developed using a simple process that blends fruits and vegetables with natural gelling agents to form soft-textured lollipops. These lollipops are designed to be easy to bite, making them suitable for both children and the elderly. The jelly form was specifically chosen as it is environmentally friendly, requires minimal processing, and allows for a variety of flavors and colors, making the product visually attractive. By enhancing the taste and presentation of fruits and vegetables, the product makes them more appealing without compromising their nutritional value. From a commercial perspective, the lollipops are low-cost to produce compared to conventional sweets, increasing their marketability and accessibility to a wide range of consumers. Preliminary feedback indicates that the product successfully encourages children to consume more fruits and vegetables while also providing an effective way to reduce food waste by repurposing surplus or less visually appealing produce. In conclusion, this innovation demonstrates a sustainable and practical method of promoting healthier eating habits while addressing the issue of food waste. By combining nutrition, affordability, and consumer appeal, these sugar-free jelly lollipops have the potential to make a positive impact on public health and inspire further development of fruit- and vegetable-based products in both the food and wellness industries.

Keywords – healthy, jelly lolipops, sugar-free, snacking

JST035 - NEODIGITS

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ABSTRACT

Neodigits is an innovative educational card tool designed to enhance mathematical problem-solving skills among students aged 10–12. Many students in this age group struggle with understanding and applying mathematical concepts to real-life scenarios such as budgeting, calculating discounts, and working with measurements. This challenge often stems from difficulty in interpreting word problems and identifying the correct steps to solve them. Neodigits addresses this issue by offering a structured, interactive approach to learning. The tool comprises four sets of cards: Keywords, Questions, How to Solve, and Answers. Students begin by identifying important terms using the Keywords cards, then proceed to solve problems step by step with the guidance of the How to Solve cards. The Questions cards provide real-world scenarios, while the Answers cards allow for self-assessment and reflection. This method promotes independent learning, systematic thinking, and deeper comprehension of mathematical processes. The tool was piloted among a group of upper primary students, where initial observations indicated increased confidence and independence in solving mathematical problems. Students demonstrated a clearer understanding of key mathematical terms and problem-solving strategies, leading to improved accuracy and reduced reliance on direct teacher intervention. In conclusion, Neodigits represents a creative and effective way to make mathematics more engaging and accessible. By integrating real-life examples with a step-by-step learning framework, it encourages active participation and critical thinking. Its affordable and easy-to-use design makes it suitable for both classroom use and self-study, particularly benefiting students who find traditional learning methods challenging. This innovation has the potential to significantly improve mathematical literacy and foster a positive learning experience for young learners.

Keywords – educational card, mathematical, problem solving

JST036 - FROM WASTE TO ELECTRICITY : A BIO-BATTERY INNOVATION

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ABSTRACT

This study presents an integrative Project-Based Learning (PBL) innovation grounded in the STEM approach, focusing on solving two critical issues: limited access to electrical energy and the environmental impact of palm oil mill effluent (POME). The innovation centers on the development of a bio-battery using POME as an electrolyte, based on the Volta cell concept. This low-cost energy solution integrates scientific principles of electricity, environmental science, linear programming, and battery technology to produce an alternative power source. The model utilizes a magnesium (Mg) anode and copper (Cu) cathode, with a wet tissue salt bridge and POME as the electrolyte. When arranged in a simple circuit, this setup produces electricity that can be measured via multimeter, connecting theoretical knowledge with practical application. Designed to benefit communities in Sabah, particularly workers in palm oil plantations, this eco-friendly battery demonstrates the potential of waste-to-energy innovation in addressing real-world energy challenges.

Keywords – Bio-Battery, POME, Renewable Energy, Volta Cell, Environmental Innovation

JST037 - ORGANOLEPTIC EVALUATION AND VITAMIN C CONTENT OF HERBAL DRINKS TO ENHANCE IMMUNE SYSTEM FUNCTION

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ABSTRACT

This research offers an alternative solution to addressing nutritional adequacy to enhance immunity for daily activities. The combination of moringa leaves and aloe vera skin can be developed into a health drink product named Keloevera Tea. This study explains how to utilize locally available plants, namely moringa leaves and aloe vera, to process them into tea and assess public acceptance of Keloevera Tea. The research consists of three stages. The first stage involves the process of making the tea from a combination of aloe vera leaves and moringa leaves. The second stage is a qualitative test to confirm the presence of vitamin C in the combination tea of aloe vera and moringa leaves. The third stage is an organoleptic test to assess the acceptance of the Keloevera Tea product among Indonesian migrant workers, involving 100 panellists. A qualitative test for vitamin C was conducted to confirm the presence of vitamin C in the tea. Keloevera tea (the combination of moringa leaves and aloe vera skin) was found to contain vitamin C, requiring 20 drops of iodine to change its color. The organoleptic test was carried out to assess public acceptance of the tea. A questionnaire was distributed via Google Forms to 100 people of various ages, who tasted the tea and rated its color, aroma, and taste. Based on the organoleptic test, presented in the form of a diagram, the highest ratings were in the "liked it very much" category. More people liked the combination tea of aloe vera and moringa leaves than those who disliked it.

Keywords – Herbal Immunity Drink, Vitamin C Qualitative Test, Sensory Evaluation, Immune System Support, Plant-Based Antioxidants

JST038 – BAHRESQ: SMART ALERT SYSTEM FOR FLASH FLOODS

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ABSTRACT

In Malaysia, flash floods have become a common disaster, especially in urban areas like Sungai Petani, Kedah. These floods usually occur after heavy rain in a short period and pose serious threats to residents in high-density areas. As such disasters become more common, there is a growing need for innovative solutions to improve public safety and disaster preparedness. BahResQ is a smart alert system designed to detect flash floods quickly and issue real-time warnings for public safety. Its main function is to provide fast, accurate alerts to residents in affected areas and the general public nearby. This allows people to avoid dangerous zones, take precautions, and plan safer travel routes. In addition to public alerts, BahResQ also notifies relevant emergency services, enabling faster response and more effective rescue efforts. The system plays a crucial role in reducing the impact of flash floods by supporting efficient evacuation, traffic redirection, and disaster monitoring. By combining early detection and rapid communication, BahResQ offers a proactive solution to the challenges posed by flash floods. It empowers communities with timely information, enhances public safety, and supports coordinated emergency response during critical situations.

Keywords – Flash floods, Smart Alert System, Real-time Warnings, Public Safety.

JST039 - CATCHMENT AND REUSE OF RAINWATER SYSTEM

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ABSTRACT

Water scarcity refers to a condition in which the available water resources in a region are insufficient to meet the growing demands for water, and this issue is increasingly evident in many parts of the world, including Malaysia. It can be broadly classified into two types: physical water scarcity, where natural water sources are inadequate, and economic water scarcity, where water is present but inaccessible due to poor governance, lack of infrastructure, or financial constraints. Addressing economic water scarcity often requires systemic changes in governance, increased funding, and a strong commitment to resolving the issue. While long-term strategies are essential for sustainable water management, the immediate need for water calls for practical short-term solutions. One such solution is rainwater harvesting and reuse, which offers a practical and efficient method to address urgent water shortages in Malaysia. This approach involves collecting and storing rainwater for domestic or non-potable uses. Since many households in Malaysia already have water storage tanks, integrating rainwater harvesting systems would only require minimal additional infrastructure and thoughtful design. By utilizing rainwater for daily needs, households can ease the pressure on central water supply systems. This method presents a decentralized, accessible, and cost-effective strategy to mitigate water scarcity. However, it is important to acknowledge that rainwater harvesting alone may not fully resolve broader water quality concerns in the country. Nevertheless, it serves as an effective supplementary solution to help address Malaysia's immediate water supply challenges.

Keywords – rainwater, catchment, reuse, sustainable, system

JST040 - SMART-SEAT : ADVANCED ENERGY HARVESTING THROUGH PIEZOELECTRIC VIBRATION AND PRESSURE DYNAMICS

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ABSTRACT

Smart Seats is a pioneering seating system that leverages piezoelectric sensors to convert mechanical stress into electrical energy. This technology addresses the challenges of limited non-renewable energy sources and rising electricity costs, particularly in remote areas. By capturing and converting forces such as pressure, vibration, or strain into electrical power. Smart Seats offers a promising solution for sustainable energy. The system is particularly well-suited for public transportation, where vibrations can generate substantial amounts of electricity. It employs piezoelectric sensors to create electrical energy, which is then managed through a quadruple bias flip and a DC-to-DC power converter to adjust voltage and current for optimal use. Additionally, batteries store the generated energy for future use. This innovative approach not only supports the 7th Sustainable Development Goal (SDG 7) by ensuring accessible and reliable energy but also enhances user comfort and provides a green solution for powering small electronic devices. Future research will focus on improving energy conversion efficiency, expanding the technology for broader applications, and seamlessly integrating it into various environments. Smart Seats represents a significant advancement in energy harvesting, offering a sustainable and efficient way to harness energy from everyday activities.

Keywords – Piezoelectric, Pressure, Smart-Seat

JST041 - MATCH THE MULTIPLY

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ABSTRACT

Match the Multiply is a creative, puzzle-based educational innovation designed to improve students' multiplication skills through interactive gameplay. Developed as a 16-piece jigsaw puzzle featuring multiplication problems and matching answers, it engages learners through visual and kinaesthetic methods. Created using ChatGPT and Canva, the puzzle bridges the gap between digital design and hands-on learning. Grounded in the Games with Rules pedagogy, it provides structured challenges that enhance reasoning, engagement, and confidence. Aligned with SDG 4: Quality Education, it promotes inclusive and effective learning experiences. At the same time, SDG 3: Good Health and Well-being is supported by reducing math anxiety and fostering a positive classroom environment. By integrating technology, creativity, and proven pedagogical strategies, Match the Multiply enhances logical thinking, boosts mathematical fluency, and builds learner confidence, demonstrating how traditional content can be transformed into a fun, accessible, and impactful tool.

Keywords – Interactive activity, Math fluency, Multiplication, Puzzle-based Learning

JST043 - ZEROWASTE FIRE STARTER

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ABSTRACT

This project introduces a novel and sustainable fire starter utilizing readily available organic waste materials: cow dung, sawdust, and beeswax. The primary objective is to transform agricultural and household waste into a valuable and environmentally friendly product, offering a safe, clean-burning alternative to commercial chemical-based fire starters. The methodology involves optimizing material ratios and fabrication techniques to achieve efficient ignition and prolonged burning. Initial results demonstrate the efficacy and potential for a consistent burn, highlighting the product's viability for diverse applications such as cooking, camping, and emergency heating. This innovation not only addresses waste management challenges but also promotes ecological awareness and hands-on green innovation within communities, fostering a deeper understanding of sustainable resource utilization and circular economy principles.

Keywords – Beeswax, Cow dung, Fire starter, Sawdust

JST044 - DEVELOPMENT AND EVALUATION OF A NATURAL LOTION FORMULATED WITH ADENANTHERA PAVONINA EXTRACT

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ABSTRACT

This research investigates the potential of Adenanthera pavonina seeds in skin care, focusing on effective extraction, product formulation, and safety testing. The study aims to extract and purify bioactive compounds, incorporate them into a lotion, and assess the stability, safety, and effectiveness of the resulting product. The process involved washing, drying, and powdering the seeds, followed by ethanol extraction and evaporation. The purified extract was incorporated into a lotion base, and the resulting product was evaluated for pH, moisture content, and skin irritation. The extraction yield of 2.89% aligns with typical 70% ethanol-based plant extractions (2-5%). The lotion exhibited a beige colour and a woody scent, with stability and homogeneity meeting the standards of natural skincare. A pH value of 7 matched the optimal range for skin compatibility, and no irritation was observed in volunteers, confirming safety. The lotion's 40.56% moisture content also fell within the ideal 30-50% range for effective hydration. This study highlights Adenanthera pavonina as a promising natural ingredient for eco-conscious skincare. It introduces a sustainable, locally sourced option to Malaysia's cosmetic market, addressing environmental trends while preserving cultural heritage. Furthermore, the researchers hope to expand global awareness of Adenanthera pavonina, promoting its benefits and applications in skincare around the world. Significantly, this study introduces a natural, locally sourced ingredient to the Malaysian skincare market, aligning with eco-friendly consumer trends and preserving cultural heritage. It also plays a crucial role in advancing scientific knowledge regarding its potential applications in dermatology, particularly in developing new treatments and therapeutic approaches for various skin conditions.

Keywords – Adenanthera pavonina, Anti-inflammatory, Eco-friendly, Moisturising, Skincare

JST045 - KIT PEMBARIS FASA-FASA BULAN

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ABSTRAK

Kajian penyelidikan yang dijalankan ini bertujuan untuk meninjau keberkesanan penggunaan Kit Fasa-Fasa Bulan untuk mengenalpasti bentuk-bentuk bulan mengikut urutan dan nama fasanya. Kajian berbentuk ini menggunakan pemerhatian. Hasil tinjauan awal mendapati seramai 5 orang murid SJK(C) Jerik sangat keliru dengan setiap fasa-fasa bulan. Dapatan kajian menunjukkan bahawa murid sukar menjawab soalan secara lisan selepas sesi PdPc. Oleh itu, dengan bimbingan dan bantuan guru murid menginovasikan Kit Fasa-Fasa Bulan. Hasil tinjauan akhir menunjukkan bahawa setiap murid dapat memahami setiap bentuk Fasa-Fasa Bulan dan boleh menskor markah dalam soalan kuiz.

Kata kunci – Fasa-Fasa Bulan, Kuiz, Penyelidikan, Pemerhatian, PdPc,

JST046 - LOLLYBALM

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ABSTRACT

Lollybalm is not a lollipop to eat, but it is a moisturising balm that resembles a lollipop and comes in various fruit flavours, making it taste good while being applied to our lips. For your information, Vitamin E helps keep our lips healthy. Additionally, the fruit flavour used for Lollybalm is Strawberry. Additionally, we also use a moisturising balm by Vaseline, but in the original flavour. The process involves boiling a combination of sugar, corn syrup, and water, then adding petroleum jelly, fruit flavours, and food colouring. Then the mixture was moulded and frozen to produce the result. In conclusion, this easy process is one everyone should try at home at least once, as it's particularly beneficial when combined with vitamin E, a nutrient that's beneficial for our lips. Besides, it can also decrease Hyperpigmentation disease that makes our lips look like we are smokers even if we aren't.

Keywords – Balm, Fruit flavour, Hyperpigmentation disease, Lips, Moisturising

JST047 - RICE SOAP BAR

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ABSTRACT

The rice soap bar is a solidified form of the starchy excess liquid from rice blend. We created the rice soap bar because it can be used more than once and can be stored easily, and it is ensured that it can last longer. To make it, heat one cup of soap base until it melted. Then, add 4 tablespoons of rice milk, 1 tablespoon of shea butter and 1 tablespoon of almond oil into the melted soap base. These ingredients need to be mixed thoroughly. Once the mixture has cooled down, add 2 drops of lavender essential oil and 2 drops of peppermint essential oil and have to be mixed again. Once the essential oils and the soap mixture are mixed thoroughly, pour the mixture into a mold. Spread out the mixture to an even level. Then, let it cure in a cool and dry place for at least a day. Once it has hardened, remove the soap from the mold and shape it into rectangles with a knife. Now, the soap is ready to be used during shower. It is believed that this soap can moisturize and brighten the skin and get rid of any existing acne. After the product was tested, it shows that the rice soap has many additional beneficial effects on the skin. For example, the shea butter contained in the rice soap bar can softened our skin. Other than that, the sweet almond oil also increased the elasticity and reduced the subtle wrinkles on our skin. In conclusion, the rice soap has many more benefits compared to its original form, thanks to the additional ingredients in the soap bar. The solid form of it is also very convenient for everyone to use.

Keywords – rice, soap, healthy

JST049 - AUTOMATIC FIRE EXTINGUISHER BOX (A-FEB)

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ABSTRAK

Alat pemadam api adalah alat penting untuk memadam kebakaran pada peringkat awal dan membantu menyelamatkan nyawa serta harta benda sementara menunggu bantuan bomba. Namun, terdapat beberapa masalah yang berlaku pada alat pemadam api seperti kejadian vandalisme terhadap alat ini dan juga kecurian. Bagi mengatasi masalah ini, projek Automatic Fire Extinguisher Box (A-Feb) telah dibangunkan. Projek ini menggunakan sensor asap, RFID dan aplikasi Telegram. A-Feb ini dikunci menggunakan solenoid dan boleh dibuka menggunakan dua kaedah. Yang pertama ianya boleh dibuka menggunakan kad RFID dan yang kedua ianya akan terbuka secara automatik apabila sensor mengesan asap. Selain itu, apabila pintu A-Feb dibuka, satu notifikasi akan sampai ke Telegram *Person-in-Charge* untuk memaklumkan bahawa kebakaran dikesan dan pintu A-Feb telah dibuka. Untuk ciri keselamatan, apabila tiada bekalan elektrik, pintu A-Feb akan terbuka secara automatik. *Strobe light* dan *buzzer* akan berbunyi apabila asap dikesan dan ini dapat memudahkan pengguna mengenalpasti kedudukan alat pemadam api dengan mudah. Projek ini bertujuan memastikan keselamatan alat pemadam api dan dapat mengelakkan alat pemadam api menjadi mangsa vandalisme dan kecurian. Projek ini berjaya dibangunkan dan diterima baik oleh pengguna serta berjaya mencapai objektifnya. Projek ini diharapkan dapat menyumbang kepada perkembangan teknologi dan meningkatkan keselamatan di premis dan kawasan sekolah.

Kata kunci – alat pemadam api, kotak pemadam api, RFID, vandalisme, automatik

JST050 - LECTURER ASSIGNMENT RFID DRAWER (LARD)

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ABSTRAK

Pada masa kini, para pensyarah dan guru masih menggunakan kaedah penghantaran tugasan secara konvensional iaitu melalui *pigeonhole* atau pelajar hanya menghantar tugasan dan meletakkan di atas meja. Kaedah ini mudah dilaksanakan, namun tetap menimbulkan masalah kepada pensyarah iaitu akan menyebabkan tugasan pelajar boleh bercampur dengan tugasan kelas yang lain atau pensyarah tidak perasan tugasan yang dihantar. Kaedah penghantaran ini juga akan menyebabkan meja dipenuhi dengan tugasan pelajar. Oleh itu, bagi menambah baik masalah kaedah penghantaran tugasan, projek Lecturer Assignment RFID Drawer (LARD) dibina. Projek LARD menggunakan laci bertingkat yang berkunci, di mana ia boleh dibuka menggunakan kad RFID. Projek ini mempunyai tiga laci yang berbeza di mana pensyarah boleh mengasingkan tugasan ke laci yang berkenaan. Apabila tugasan masuk ke dalam laci, IR sensor akan mengesan tugasan yang dihantar dan akan menghantar isyarat ke ESP32, di mana satu mesej akan sampai ke telegram pensyarah bagi memaklumkan bahawa tugasan telah dihantar. Pensyarah boleh membuka ketiga-tiga laci menggunakan satu kad RFID yang sama. Ini dapat memberi kemudahan kepada pensyarah. Hasil projek ini dapat digunakan oleh pensyarah, guru atau mana-mana tenaga pengajar yang lain. Projek ini juga boleh menggantikan penggunaan *pigeonhole* di pejabat pensyarah. Diharapkan projek ini dapat menambah baik pengurusan penghantaran tugasan dan meningkatkan kualiti pengurusan pendidikan.

Kata kunci – Tugasan Pelajar, Kad RFID, Notifikasi Tugasan, Laci Tugasan

JST051 - E-VISION: HELPING THE BLIND EXPERIENCE THE WORLD AGAIN

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ABSTRACT

Blind individuals often face difficulties in reading printed text, recognizing objects around them, and getting help in emergencies. Traditional solutions such as white canes or guide dogs help with mobility but do not fully support these daily challenges. This inspired us to develop e-Vision, an AI powered smart wearable designed to assist the visually impaired by turning visual information into sound. The main objective of e-Vision is to provide a portable and affordable solution that helps blind users read, recognize their surroundings, and request help with ease. The device uses a Raspberry Pi Zero 2W and Camera Module V3 to capture images. It processes them using the Google Vision API for Optical Character Recognition (OCR) and object detection, while text-to-speech engine *pyttsx3* converts the information into speech. A one-touch emergency button sends an alert to a trusted contact via the Telegram apps and triggers a buzzer to alert nearby people. The device is powered by a UPS Power HAT with a built-in battery level checking function. e-Vision brings real benefits to users, such as increased independence, safety, and confidence. It supports use in education, healthcare, daily life, and emergency situations. The design is small, wearable, and ready for further improvements. This innovation represents a significant step toward a more inclusive society, aligning with the United Nations' goals to reduce inequalities and promote well-being for all. In conclusion, e-Vision is a practical and impactful invention that helps blind individuals experience the world through sound, offering real-time support in daily life. e-Vision is not just a device, it is a lifeline for those who need it most.

Keywords: Assistive Technology, AI Vision System, Blind Accessibility, Smart Wearable, Emergency Alert Device

JST052 - HERBAL HARMONY CREAM

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ABSTRACT

Herbal Harmony Cream is a natural skincare product formulated to reduce redness and inflammation while promoting skin health. With increasing consumer demand for herbal-based skincare solutions, this cream provides an effective and gentle alternative to synthetic treatments. The primary issue addressed is the need for a safe, non-irritating solution for individuals with sensitive skin prone to redness. The objective of this study was to develop an herbal formulation that harnesses the therapeutic properties of medicinal plants. The cream contains Angelica Dahurica, Angelica Sinensis, mint leaves, and myrrh, known for their anti-inflammatory and soothing effects. The production process involved grinding dried herbs, infusing them in black sesame oil for several weeks, and blending the mixture with beeswax and peppermint essential oil. Laboratory and user trials confirmed its efficacy in reducing skin redness, improving texture, and maintaining hydration. Compared to synthetic alternatives, Herbal Harmony Cream showed fewer side effects, making it suitable for sensitive skin. Further research is necessary to optimize ingredient combinations and validate its benefits through extensive clinical trials. The development of eco-friendly packaging and variant formulations can enhance sustainability and consumer accessibility. Herbal Harmony Cream represents a promising step toward natural, effective skincare solutions.

Keywords: Herbal skincare, anti-inflammatory, redness reduction, eco-friendly skincare, botanical formulation

JST054 - BALM AROMATHERAPHY MINDA

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ABSTRAK

"Balms Aromatherapy Minda" merupakan satu inovasi yang dihasilkan untuk membantu meningkatkan fokus, mengurangkan tekanan, dan memberi ketenangan minda, terutama bagi pelajar yang menghadapi cabaran akademik dalam kehidupan harian. Tekanan dan keletihan mental sering mengganggu daya tumpuan serta produktiviti pelajar, menyebabkan mereka sukar untuk memahami pelajaran dan mencapai prestasi optimum. Hal ini turut memberi kesan kepada emosi dan kesejahteraan diri secara keseluruhan, yang mana akan menjejaskan kehidupan sosial dan akademik seseorang individu. Kebanyakan produk di pasaran mengandungi bahan sintetik yang mungkin memberi kesan sampingan dalam jangka panjang seperti alahan, iritasi kulit, atau ketagihan bau buatan. Oleh itu, balm ini diformulasikan menggunakan bahan semula jadi seperti **minyak engkabang**, **madu kelulut**, **serai wangi**, dan **peppermint** yang mempunyai sifat terapeutik dalam meningkatkan daya fokus, menenangkan minda, serta memberikan kesegaran semula jadi tanpa risiko kesan sampingan berbahaya. Minyak engkabang berfungsi sebagai pelembap semula jadi yang kaya dengan nutrien untuk kulit. Madu kelulut pula mengandungi antioksidan yang membantu menyokong kesihatan mental dan emosi. Serai wangi memberikan kesan menenangkan yang boleh mengurangkan kebimbangan, manakala peppermint merangsang deria bau untuk meningkatkan kepekaan serta daya fokus seseorang. Selain itu, produk ini mudah digunakan, tidak berminyak, dan boleh dibawa ke mana-mana. Ia selamat digunakan oleh semua peringkat umur, termasuk pelajar sekolah, mahasiswa, golongan bekerja, dan juga warga emas yang ingin mendapatkan ketenangan atau mengurangkan tekanan. Aplikasinya yang hanya perlu disapu di pergelangan tangan, pelipis, atau bawah hidung memudahkan pengguna menikmati manfaatnya pada bila-bila masa. Dengan manfaat aromaterapi dan formulasi berasaskan bahan organik, **"Balm Aromatherapy Minda"** berpotensi menjadi penyelesaian semula jadi yang berkesan untuk meningkatkan kesejahteraan mental, memperbaiki kualiti tidur, serta menyokong gaya hidup sihat dan seimbang dalam kalangan masyarakat masa kini. Inovasi ini bukan sahaja membawa nilai tambah kepada kesihatan mental, malah menyumbang kepada usaha memperkenalkan produk tempatan berasaskan sumber alam yang lestari.

Kata kunci – Balm, minyak engkabang, fokus minda

JST055 - GUARDIAN SENSE

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ABSTRACT

This project presents a smart vehicle safety system that integrates AI-based object detection, facial recognition, temperature monitoring, and alerting. The system aims to prevent dangerous situations where living beings—such as children, babies, or pets—are accidentally left inside a parked vehicle. Using an AI camera, Micro: bit, and Wi-Fi module, the system can detect living objects, classify them as human or animal, and monitor the internal temperature of the vehicle. If unsafe temperature levels (above 35°C) are detected, especially when a living being is present, the system sends real-time alerts via Telegram and activates audible alarms to notify the owner and nearby individuals. Facial recognition is used to identify if the living object detected is a known individual. This comprehensive approach ensures timely alerts and improves vehicle safety, especially in hot climates. This solution offers a reliable and automated safety mechanism, especially vital in hot environments, to prevent life-threatening incidents inside vehicles.

Keywords – smart vehicle safety system, AI object detection, temperature monitoring, prevent life-threatening incidents

JST056 - ECZEMEASE: JOJOBA, *CENTELLA ASIATICA* AND NEEM AS NATURAL RELIEF FOR LITTLE SKIN

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ABSTRACT

Eczema, or atopic dermatitis, is a common chronic skin disease affecting many children, causing persistent itching, redness, dryness and skin irritation, which often leads to discomfort, poor sleep and reduced quality of life. Although corticosteroid creams are widely used to control these symptoms, their long-term use can cause undesirable side effects such as skin thinning, irritation and hormonal disruption, making them less suitable for young children. In search of safer alternatives, jojoba oil has attracted attention due to its natural anti-inflammatory and moisturizing properties. Jojoba oil contains compounds similar to natural skin sebum and includes myristic acid derivatives, which have a natural steroid-like action that can help to reduce skin inflammation without harmful effects. Furthermore, jojoba oil is gentle and hypoallergenic, making it ideal for sensitive skin, particularly in children. To enhance its effectiveness, this product utilizes a natural jojoba lotion base (enriched with jojoba oil, vitamin E and D-Panthenol) as the primary components, combined with *Centella asiatica* (Gotu kola or *'pegaga'*) and *Azadirachta indica* (Neem or *'semambu'*) extracts, both traditionally recognized for their skin-healing, anti-inflammatory, antimicrobial and skin-regenerating benefits. C*entella asiatica* and neem extracts incorporated into a jojoba lotion base at safe concentrations and mixed at a controlled low temperature, not exceeding 40°C, to maintain the activity of the natural compounds and ensure a smooth, stable lotion formulation, free from harmful chemicals and parabens. This nature-inspired remedy lotion, based on jojoba oil formulated with *Centella asiatica* and neem extracts, works together to provide powerful skin benefits by deeply moisturizing, reducing inflammation, soothing itchiness and promoting healing, making it an ideal natural and gentle remedy for sensitive skin conditions like eczema, while supporting skin repair, hydration and protection without the side effects of synthetic treatments. Ultimately, it offers a natural, child-friendly alternative to conventional corticosteroid creams for long-term eczema and skin care management.

Keywords – jojoba oil, centella asiatica, neem, eczema, skin

JST057 - ZESTUHALIA:FOR INDONESIA ZERRO STUNTING AND HEALTHY CITIZEN

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ABSTRACT

Stunting remains a critical public health issue in Indonesia, with 1 in 5 children still affected. It requires collaborative action. to address this vital need, we've developed ZESTUHALIA (Zerro Stunting and healthy life application), an interactive and comprehensive android application that contain all information about triple burden of malnutrition (stunting, mal nutrition) including interactive simulation, videos, posters to make user understand, BMI calculator with result and its recomendation make user knows their body condition and how to deal with it. Last but not least is this application promotes healthy Indonesian additional food and beberages with link location and beverages. This application serve in biligual so it suitable for local and foreign tourist to taste Indonesian culiner. By integrating health education, personalized tools, and cultural promotion. One ZESTUHALIA aims to support the national movement towards zero stunting and a healthier generation.

Keywords – Zerrostunting, Indonesian cuisine, healthy-generation

JST058 - NOV CANDLE WITHOUT HASSLE

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ABSTRACT

Candles are traditionally used for lighting and ambiance, but many commercial candles, especially those made from paraffin wax, release harmful toxins like toluene and benzene. The NOV (Natural, Organic, Versatile) Candle introduces a safer alternative using coconut wax, a clean-burning and biodegradable material. This project aims to naturally repel insects using herbal-infused candles and produce biodegradable, nutrient-rich residue to improve soil moisture and fertility. So, two versions were developed: an insect repellent candle infused with natural herbs (neem, betel, mint, and eucalyptus), and a fertilizer candle made with biodegradable materials (cow dung, tea waste, and garlic peels). This research promotes the use of natural herbs in candles as an eco-friendly alternative to synthetic insect repellents like DEET, reducing exposure to harmful chemicals for humans and the environment. The development of an insect-repellent candle offers a low-cost, accessible, and sustainable insect control method that can be used in homes, especially in communities with limited access to commercial repellents. The research adds valuable data on the effectiveness of specific natural herbs (beetle leaf, mint leaf, and neem) when used in wax-based delivery systems, helping expand knowledge in the field of botanical insecticides. Testing showed the NOV candle burned 50% longer than conventional candles and effectively repelled insects such as ants. A water absorption test indicated improved soil moisture retention from the fertiliser residue. The NOV Candle offers an eco-friendly, multifunctional solution that supports responsible consumption. This project seeks to address the gaps in sustainable wellness products by creating a trio of coconut-wax-based candles that promote health, reduce disease risk, and support environmental resilience, all while adhering to the principles of the United Nations' Sustainable Development Goal 3: Good Health and Well-being. Plans include product scent optimization, long-term plant growth studies, and zero-waste packaging design. With commercial potential and meaningful environmental impact, NOV Candle is truly a light with purpose.

Keywords – coconut wax, bio-based product, insect repellent, fertilizer, sustainable innovation

JST059 - ECOBIN SMART

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ABSTRAK

Tong sampah automatik dicipta untuk meningkatkan tahap kebersihan dalam kehidupan seharian. Ia memudahkan proses pembuangan sampah tanpa perlu menyentuh permukaan tong. Ini mengurangkan risiko penyebaran bakteria dan virus. Teknologi ini amat berguna terutama dalam situasi pandemik. Tong sampah automatik menggunakan penderia untuk mengesan pergerakan tangan. Apabila dikesan, penutup akan terbuka secara automatik. Ini menjadikan proses membuang sampah lebih selamat. Ia sangat membantu di tempat awam seperti hospital, sekolah, dan restoran. Penggunaan tong ini juga menggalakkan amalan kebersihan. Ia sesuai digunakan di rumah untuk memudahkan kerja harian. Tong ini juga direka dengan reka bentuk moden. Ia selaras dengan konsep rumah pintar. Selain itu, ia menjimatkan masa kerana tidak perlu menekan penutup secara manual. Penciptaan tong sampah ini juga menyumbang kepada gaya hidup yang lebih sistematik. Ia menarik minat pengguna untuk membuang sampah.

Kata kunci: tong sampah, kebersihan, rumah pintar

JST060 - GRABBER HAND MEKATRONIK

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ABSTRAK

Projek ini bertujuan mereka bentuk dan membina sebuah Grabber Hand Mekatronik yang mampu mencengkam dan mengangkat objek secara automatik atau separa automatik. Sistem ini menggabungkan elemen mekanikal, elektronik, dan pengaturcaraan, selaras dengan prinsip mekatronik moden. Grabber ini dibina menggunakan bahan ringan dan tahan lasak seperti plastik ABS atau akrilik serta disokong oleh struktur aluminium bagi ketahanan. Bahagian utama termasuk motor servo, sensor ultrasonik, pemegang (gripper), dan lengan berengsel. Mekanisme gripper direka supaya boleh membuka dan menutup secara tepat dengan kawalan melalui mikropengawal Arduino Uno. Servo motor mengawal pergerakan genggaman, manakala sensor ultrasonik berfungsi mengesan objek dan mengatur jarak cengkaman. Litar dikawal dengan kod atur cara Arduino IDE, melibatkan arahan digital dan bacaan sensor. Beberapa ujian telah dijalankan untuk memastikan ketepatan tindak balas sensor dan kekuatan cengkaman gripper. Sistem ini boleh dikawal secara automatik berdasarkan sensor atau manual menggunakan suis atau Bluetooth. Tambahan pula, bekalan tenaga 9V atau bateri lithium digunakan bagi memastikan prestasi stabil. Struktur lengan direka ergonomik untuk menampung objek bersaiz kecil dan sederhana. Projek ini sesuai untuk digunakan dalam industri ringan, pendidikan, atau sebagai asas robotik pemula. Kos pembinaan projek dianggarkan sekitar RM80–RM150, bergantung kepada jenis komponen yang digunakan. Waktu siap sepenuhnya mengambil masa 1 hingga 2 minggu, termasuk fasa ujian dan dokumentasi. Projek ini memberi pendedahan kepada pelajar dalam pengaturcaraan mikrokawal, pematerian, serta penyelesaian masalah teknikal secara langsung. Secara keseluruhan, Grabber Hand Mekatronik ini merupakan satu projek kejuruteraan inovatif dan praktikal yang merangkumi pelbagai disiplin ilmu. Ia juga berpotensi dikembangkan menjadi sistem robotik yang lebih kompleks pada masa depan seperti robot lengan industri, sistem automasi gudang, atau robot servis manusia.

Kata kunci: mekatronik, robotik, automasi

JST062 - ECOGREEN

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ABSTRAK

Projek ini memperkenalkan inovasi sudu dan bekas makanan yang dihasilkan menggunakan ekstrak daripada serai dan tebu sebagai alternatif mesra alam kepada produk plastik sekali guna. Serai dan tebu dipilih kerana mengandungi serat semula jadi yang kuat, tahan panas, dan selamat untuk kegunaan makanan. Proses penghasilan melibatkan pengeringan, pengisaran, dan pengacuan bahan mentah menjadi bentuk yang diingini. Produk akhir bersifat biodegradasi, tidak toksik, serta mampu mengekalkan bentuk dan kekuatan ketika digunakan. Inovasi ini berpotensi mengurangkan pencemaran plastik, menyokong kelestarian alam sekitar, dan memberi nilai tambah kepada sisa pertanian tempatan.

Kata kunci: inovasi, ekstrak serai, pencemaran

JST063 - SOLAR BROOM

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ABSTRAK

Inovasi kereta prototaip berasaskan plastik ini dibangunkan dengan objektif untuk menghasilkan kenderaan ringan, mesra alam dan kos efektif. Struktur badan kereta direka menggunakan plastik kitar semula yang diproses semula bagi meningkatkan kekuatan, ketahanan dan keselamatan pengguna. Penggunaan bahan plastik ini membantu mengurangkan berat keseluruhan kenderaan, sekali gus meningkatkan kecekapan tenaga dan mengurangkan penggunaan bahan api. Reka bentuk aerodinamik diaplikasikan untuk mengurangkan rintangan angin, memaksimumkan kelajuan serta mengoptimumkan prestasi. Selain itu, penggunaan bahan mesra alam ini dapat menyokong usaha mengurangkan pencemaran karbon serta menggalakkan amalan kitar semula dalam industri automotif. Prototaip ini juga direka untuk mudah dihasilkan dengan kos yang lebih rendah berbanding kenderaan konvensional, menjadikannya berpotensi besar untuk pengeluaran secara komersial. Projek ini membuktikan bahawa bahan plastik kitar semula mempunyai nilai guna yang tinggi, dan mampu menjadi alternatif inovatif dalam pembangunan pengangkutan moden yang menitikberatkan kelestarian alam, inovasi teknologi, serta kesedaran terhadap penjagaan bumi.

Kata kunci: prototaip, mesra alam, kelestarian

JST064 - IOT GREEN HOUSE

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ABSTRAK

Projek IoT Greenhouse ini dibangunkan bagi memantau dan mengawal persekitaran rumah hijau secara automatik menggunakan teknologi Internet of Things (IoT). Sistem ini dilengkapi dengan sensor suhu, kelembapan, cahaya dan kelembapan tanah yang menghantar data secara masa nyata ke aplikasi mudah alih. Berdasarkan bacaan sensor, sistem akan mengawal kipas, penyiram automatik dan pencahayaan bagi memastikan keadaan optimum untuk pertumbuhan tanaman. Pemantauan jarak jauh membolehkan pengguna mengurus rumah hijau dengan lebih efisien, menjimatkan tenaga dan air. Inovasi ini berpotensi meningkatkan produktiviti tanaman, mengurangkan kos operasi, dan menyokong pertanian pintar yang mesra alam.

Kata kunci: Internet of Things (IoT), automatik, mesra alam

JST065 - D-GLUCITOL-INFUSED CELLULOSE NANOCRYSTALS (CNCS) IN CORNHUSK (ZEA MAYS) BIOCOMPOSITE FILM AS A POTENTIAL PACKAGING MATERIAL

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ABSTRACT

Plastic packaging trash has become an urgent environmental issue due to its non-biodegradability. Based on Global Alliance for Incinerator Alternatives (2019), Almost 164 million pieces of sachets are utilized within the Philippines daily, equating to around 59.7 billion pieces of sachets yearly, 48,000,000 shopping bags, and an estimated 45,000,000 thin-film bags every day. The aim of this study was to formulate biocomposite films based on cellulose nanocrystals infused with d-glucitol from corn husk (*zea mays*) as a potential food packaging material. With the focus on reducing waste and promoting eco-friendly materials, the research study aligns with Sustainable Development Goals 12 and 13, which advocate for responsible consumption and production, and climate action. The researcher conducted these methods: I. Content analysis of the biocomposite film. II. Tensile strength test. III. Water absorption. IV. Biodegradability test of the film. Fourier transform infrared spectroscopy (FTIR) confirmed the presence of CNCs in the films, validating the composition of the material. The tensile strength of the cornhusk biocomposite film increased from 2.60 N/cm to 3.36 N/s. m2, with an average of 3.06 N/cm2. Water absorption tests showed a high uptake ranging from 162.96% to 220.69% after 24 hours, with an average of 178.16%. All biocomposite film samples were completely degraded after 14 days, indicating the inability to withstand controlled conditions. The findings suggest that D-glucitol-infused cellulose nanocrystals biocomposite film derived from corn husk offer a great potential as a biodegradable packaging alterntives.

Keywords: Cornhusk, Biocomposite film, FTIR Analysis, Cellulose Nanocrystals (CNCs)

JST066 - ALGEBRIK

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ABSTRACT

ALGEBRIK is an innovative self-knitting kit made from algae-based bio yarn that encourages sustainable crafting while offering a solution to environmental issues caused by excessive algae and seaweed growth. These aquatic plants, when left unmanaged, can overpopulate rivers and lakes due to nutrient pollution, leading to a harmful process called eutrophication which reduces oxygen levels in water and endangers marine ecosystems. This project focuses on transforming that excess biomass into a renewable and biodegradable material that can be repurposed for creative use. The yarn used in ALGEBRIK is formulated through a combination of sodium alginate, calcium chloride, vegetable oil and glycerin submerged in calcium chloride solution which together produce a flexible and durable thread suitable for hand knitting after drying. Users of the kit are invited to craft small accessories or decorative items, learning basic knitting skills while engaging with eco-friendly innovation. Not only is the yarn safe for the environment during use, but after disposal it naturally breaks down and can even serve as fertilizer, enriching soil without leaving harmful waste. This product supports several United Nations Sustainable Development Goals, including Goal 12 for responsible consumption, Goal 13 for climate action, Goal 14 for life below water, and Goal 9 for innovation in industry. By offering a practical and educational experience, this project highlights how a simple kit can turn an ecological threat into a functional, hands-on solution that blends science, art, and sustainability.

Keywords – bio-yarn, algae, self-knitting kit

JST067 - INVESTIGATING THE EFFICACY OF MALUNGGAY (MORINGA OLEIFERA) LEAVES EXTRACT AS NATURAL PESTICIDES FOR CONTROLLING APHIDS IN TOMATO PLANTS

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ABSTRACT

The study demonstrated that both Malunggay (Moringa oleifera) leaf extract and isopropyl alcohol achieved 100% aphid mortality in trials, confirming their effectiveness as pest control agents. However, there were significant differences in how each treatment affected tomato fruit quality over five weeks.Fruits treated with isopropyl alcohol began showing damage as early as Week 2, with light yellow spots and surface cracks. By Week 3, the damage progressed to bruising, noticeable yellowing, and deeper cracks, culminating in severe browning and decay by Week 5. This deterioration highlighted the negative impact of isopropyl alcohol on fruit quality.In contrast, tomatoes treated with Malunggay leaf extract remained mostly unaffected throughout the observation period. There were no signs of injury or discoloration in the early weeks, and only mild yellowing was noted by Week 5. These results indicate that Malunggay leaf extract preserves fruit quality better, making it a promising natural and eco-friendly pesticide for sustainable agriculture.

Keywords: Malunggay, Aphid control, Tomato fruit quality, Natural Pesticide, Sustainable agriculture

JST068 - SMART SCIENCE APP - YEAR 6

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ABSTRACT

The SMART SCIENCE - Year 6 is an innovative digital learning platform designed to revolutionize science education for Malaysian primary school students. Many Year 6 learners struggle to master science concepts due to rigid, textbook-heavy teaching approaches and unequal access to quality learning resources, especially in rural areas. This app directly addresses these challenges by delivering a curriculum-aligned, student-centred experience through interactive video lessons, gamified quizzes, concise revision notes, and live online classes via Zoom or Google Meet. It enables flexible, self-paced learning anytime and anywhere, fostering deeper understanding and sustained engagement. The app also introduces students to **basic artificial intelligence concepts** through simple, beginner-friendly modules that ignite curiosity about technology and its role in science. Uniquely, SMART SCIENCE integrates a **built-in marketplace** where teachers can sell self-developed science modules, with proceeds funding app maintenance and supporting school club activities, creating a sustainable, school-driven ecosystem. A dedicated **knowledge-sharing hub** provides quick educational tips, science-related updates, and parenting guidance to benefit both students and parents. Its novelty lies in combining curriculum relevance with modern digital tools, community-based sustainability, and multi-stakeholder involvement, tailored specifically for 12-year-olds. Affordable, scalable, and impactful, the SMART SCIENCE App has strong commercialization potential, aligns with Malaysia's digital transformation agenda, and addresses global calls for equitable access to STEM education. Ultimately, it empowers young learners, bridges learning gaps, and equips students with essential 21st-century skills, preparing them not just for exams, but for a future driven by science, technology, and innovation.

Keywords – SMART SCIENCE - Year 6, Science Education, Interactive Video Lessons, Basic Artificial Intelligence and Knowledge-Sharing Hub

JST069 - *ECOBLOOM BASE* : SPAN BUNGA MESRA ALAM

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ABSTRAK

EcoBloom Base: Span bunga mesra alam, merupakan span gubahan bunga mesra alam yang dicipta sebagai alternatif kepada span bunga konvensional yang sukar terurai dan mencemarkan alam sekitar. Inovasi ini memanfaatkan bahan organik seperti *cocopeat* dan kanji semula jadi bagi menggantikan komponen plastik mikro dalam span biasa. Proses penghasilan span melibatkan teknik pemadatan, pembentukan dan pengeringan yang menghasilkan tekstur span yang padat dan mampu menyerap air dengan baik, sekali gus mengekalkan kesegaran bunga untuk tempoh yang optimum. Selain itu, *EcoBloom Base* mudah terurai, tidak mengeluarkan bahan toksik, dan sesuai digunakan untuk pelbagai jenis gubahan bunga samada gubahan menggunakan bunga segar ataupun bunga plastik. Inovasi ini bukan sahaja mengurangkan sisa plastik dalam industri floral, malah meningkatkan kesedaran penggunaan bahan lestari dalam kalangan penggubah bunga industri mahupun pelajar untuk digunakan semasa amali terutama pelajar Program Reka Bentuk Floral di Kolej Vokasional (Pertanian) Teluk Intan.

JST070 - SMART MATH APP - FORM 1

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ABSTRACT

The SMART Math App - Form 1 is an innovative digital learning platform developed to address key challenges in secondary school mathematics education in Malaysia. Traditional teaching methods often fail to engage students, especially those from underserved communities with limited access to quality educational resources. This app integrates technology such as live online classes, interactive video lessons, gamified quizzes, AI introduction modules, and personalized teacher support to provide a flexible, student-centered learning experience. The main objective is to enhance students' understanding, performance, and interest in mathematics while ensuring equitable access to quality education. A one-month pilot involving 90 Form 1 students showed significant improvement in learning outcomes and engagement, as measured through pre- and post-assessments and Likert-scale feedback. A standout feature of SMART Math is its built-in marketplace that allows teachers and students to sell educational modules, with proceeds supporting school clubs and ICT innovation initiatives. Complementing its learning tools, the app also features a dedicated knowledge-sharing hub, similar to an educational lifestyle portal, that shares general yet valuable content for both students and parents. This includes daily life tips, parenting guidance, study techniques, motivational articles, and other engaging educational materials designed to inspire learning beyond the classroom. These features collectively transform the app into a dynamic learning platform and a sustainable entrepreneurial ecosystem. The project aligns with multiple SDGs, including Quality Education (SDG 4) and Reduced Inequalities (SDG 10), and is designed to scale across levels and subjects. SMART Math demonstrates strong potential for commercialization, educational impact, and long-term sustainability in the evolving digital education landscape.

Keywords: Digital Learning Platform, Mathematics Education, Educational Resources, Marketplace, Knowledge-Sharing Hub, Educational Resources

JST071 - ReCap ALPHABETS

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ABSTRAK

ReCap Alphabets ialah satu inovasi bahan bantu mengajar (BBM) yang dihasilkan melalui proses kitar semula tudung botol plastik terpakai untuk membentuk huruf abjad. Inisiatif ini lahir daripada keprihatinan terhadap isu pencemaran plastik yang semakin membimbangkan di peringkat global dan tempatan. Menurut laporan United Nations Environment Programme (UNEP), dianggarkan sebanyak 11 juta tan plastik memasuki lautan setiap tahun, dan jumlah ini dijangka meningkat dua kali ganda menjelang tahun 2040 jika tiada langkah serius diambil. Plastik seperti tudung botol sering dianggap sisa kecil tetapi menyumbang besar terhadap pencemaran kerana ia sukar terurai dan sering terlepas ke persekitaran. Di sekolah pula, penggunaan bahan bantu mengajar plastik pakai buang turut menyumbang kepada penambahan sisa ini. Oleh itu, ReCap Alphabets diperkenalkan sebagai satu pendekatan mesra alam yang memanfaatkan sisa plastik menjadi alat bantu pendidikan yang berguna, tahan lama dan selamat. Melalui proses pencairan dan penggunaan acuan, tudung botol diubah menjadi huruf-huruf berwarna-warni yang boleh digunakan dalam aktiviti literasi awal seperti pengenalan huruf, fonik, dan ejaan. Projek ini turut melibatkan kolaborasi komuniti dalam aktiviti pengumpulan tudung botol dan menyemai kesedaran tentang kepentingan 3R (Reduce, Reuse, Recycle) sejak peringkat sekolah rendah. Inovasi ini bukan sahaja menyumbang kepada pengurangan sisa plastik, malah memberi impak positif kepada pembelajaran murid dan persekitaran sekolah. Ia berpotensi untuk diperluas kepada simbol matematik, nombor, atau versi mesra pendidikan khas. Secara keseluruhannya, ReCap Alphabets membuktikan bahawa pendidikan dan kelestarian alam boleh digabung secara kreatif untuk membina generasi yang lebih peka terhadap alam sekitar.

Kata kunci – bahan bantu mengajar, kitar semula, tudung botol plastik, literasi awal, kelestarian alam

JST072 - FLORATINT

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ABSTRACT

FloraTint is an eco-friendly innovation that utilises local flower petals such as roses (*Rosa spp.*), hibiscus (*Hibiscus rosa-sinensis*), and butterfly pea (*Clitoria ternatea*) to produce natural dyes suitable for artistic purposes. This product was created as an alternative to synthetic dyes, which often contain harmful chemicals and contribute to environmental pollution. The novelty of FloraTint lies in its simple, low-cost extraction method that produces vibrant, non-toxic colours without the need for industrial processing. The production process involves selecting fresh flower petals, washing to remove impurities, crushing or blending with warm water, filtering the extract, and adding natural stabilising agents such as vinegar or salt to prolong shelf life. The resulting dye can be applied to paper, fabric, and other art media. Tests conducted on various surfaces demonstrated good colour intensity, stability, and resistance to fading for up to two weeks when stored properly. FloraTint's usefulness extends beyond art creation, as it also promotes environmental awareness, sustainable resource use, and creative learning. It is highly suitable for educational projects, especially in schools and vocational institutions, and has the potential for small-scale commercialisation in the creative industry. This innovation not only reduces reliance on synthetic pigments but also showcases the potential of local floral biodiversity as a valuable natural resource.

Keywords – FloraTint, natural dye, flower-based pigment, eco-friendly innovation, sustainable art material

JST073 - EUCAFRESH

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ABSTRACT

EucaFresh is an innovative natural tablet developed from dried eucalyptus leaves as its primary ingredient. This product was designed to address unpleasant odors and insect disturbances in floral arrangements; particularly fresh cut flowers placed in water. The production process of EucaFresh involves drying eucalyptus leaves, grinding them into fine powder, and compressing them into compact tablets using eco-friendly binders. EucaFresh functions as a natural insect repellent while also prolonging the vase life of cut flowers by reducing bacterial growth in the water. The uniqueness of this product lies in its organic formulation without harmful chemicals, making it safe for use in enclosed environments such as event halls or display rooms. Additionally, it is environmentally friendly, utilizing renewable natural resources, easy to use, and cost-effective to produce. The marketing potential of EucaFresh extends to the floriculture industry, wedding events, hospitality sectors, and household use. By incorporating this product, users can enjoy floral arrangements that remain fresh for longer, insect-free, and visually appealing with a pleasant scent.

Keywords – EucaFresh, fresh flowers, floral arrangement, insect repellent, eco-friendly

JST074 - SOLAR POWERED FARM PROJECT

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ABSTRACT

This project is about a small solar-powered fan system built into a farm model. The main purpose is to teach primary school students about renewable energy in a fun and practical way. The model uses a small solar panel to power a DC fan, showing how sunlight can be changed into electricity and used in farming. The fan helps improve ventilation in animal barns, keeps the animal cooler, and creates a healthier environment for them. By using solar power, farms can reduce electricity costs and rely less on the national power grid. This is very useful in rural areas where electricity supply can sometimes be limited or unstable. Solar energy is also better for the environment because it does not produce harmful gases like fossil fuels. This project is also an interesting learning tool for students. It encourages them to explore science, technology, engineering, and mathematics (STEM) in a hands-on way. Students can see for themselves how renewable energy works and why it is important for the future. The design of the model is simple, so it can be easily copied or made bigger for real farming use. It can also inspire small business ideas, like selling solar-powered kits for schools or farms. Overall, the solar-powered farm project combines creativity and simple engineering to show how clean energy can be used in everyday life. It helps students understand renewable energy and encourages them to think of new ways to protect the environment while solving real problems.

Keywords – solar power, environment, energy saving

JST080 - AQUAPONIC MONITORING SYSTEM WITH IoT AND TELEGRAM (AQUAGROW)

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ABSTRACT

The continuous growth of the global population and the decline in fertile land due to climate change have significantly impacted global food security. Extreme weather events, glacier melting, disrupted rainfall patterns, and water crises place immense pressure on traditional agricultural systems. Aquaponics integrates two main practices; aquaculture and hydroponics; into a single, sustainable system. This method requires comprehensive monitoring of both the mineral content in plants and the water quality in aquaculture. The main objective of this project is to develop an aquaponics system and database that can be managed through a smartphone application. Guided by the Design Thinking model, the idea for AquaGrow was conceived. AquaGrow is an intelligent aquaponics system based on Internet of Things (IoT) technology, enabling virtual monitoring of environmental temperature, water temperature, and environmental humidity. The system is also equipped with a virtual fish feeding function, offering a holistic approach to aquaponics management. Sensor data is transmitted to a user-friendly digital application, allowing remote monitoring and control. The system uses the Thinger.io platform for periodic monitoring via smartphones, and it sends alerts to a Telegram application in case of abnormal environmental temperature or humidity readings. Therefore, the development of AquaGrow contributes to the advancement of high-tech sustainable agriculture, aligning with Sustainable Development Goal (SDG) 9 – Industry, Innovation, and Infrastructure.

Keywords – Aquaponics, Internet of Things (IoT), Sustainable Agriculture

JST081 - STUDY OF THE EFFICIENCY OF WATER PURIFICATION AND LARVICIDAL EFFECT ON MOSQUITO LARVAE USING *MORINGA OLEIFERA* SEED EXTRACT COMBINED WITH *PIPER BETLE* L. EXTRACT

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ABSTRACT

This project aims to develop a natural-based method for wastewater treatment using extracts from *Moringa oleifera* seeds and *Piper betle* L. leaves to produce clear and clean water while reducing mosquito larvae, which are vectors of dengue fever and filariasis. The study emphasizes promoting community health through sustainable water resource management. Experimental results showed that a 13 g/L solution of *Moringa oleifera* seeds effectively clarified wastewater and adjusted pH to an appropriate range. Crude extract from *Piper betle* leaves efficiently eliminated mosquito larvae, with LT_{50} ranging from 5 to 7.5 hours. However, using *Piper betle* leaves alone may cause water turbidity. When combined with *Moringa* seeds, water clarity improved significantly. The integration of both extracts provides a safe, cost-effective, and environmentally friendly approach to wastewater treatment. This method not only enhances water quality in community water sources but also reduces health risks associated with wastewater exposure, offering an effective and sustainable strategy for clean water management that aligns with public health objectives.

Keywords – Moringa oleifera seeds, Piper betle, wastewater treatment, mosquito control, community health

JST082 - THE AERO-MIST DESK

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ABSTRACT

The Aero-Mist Desk is an innovative, non-electric cooling and alertness system designed to enhance comfort and concentration in classroom environments. Many students struggle to stay focused during long lessons, especially in warm conditions, leading to reduced engagement and productivity. Traditional cooling solutions like fans or air conditioning are costly, energy-intensive, and not always practical in every classroom. Aero-Mist Desk addresses this challenge with a simple yet effective manual misting mechanism integrated directly into the desk. Beneath the desk surface lies a sealed water compartment connected to a fine mist nozzle via a durable silicone tube. By pressing a mechanical push-button, the user activates a manual pump that delivers a refreshing micro-mist into the air around the face area. This gentle mist provides an instant cooling effect, reducing heat discomfort and helping students stay alert without disrupting lessons. The product's novelty lies in its fully manual operation which requires no electricity, batteries, or external power sources and thus making it safe, cost-effective, and environmentally friendly. The design is compact, easy to maintain, and adaptable to most standard desk models. The removable water compartment ensures hygiene, while the mist nozzle produces fine droplets that cool without soaking nearby materials or electronics. Key benefits include improved student alertness, enhanced thermal comfort, and a reduction in classroom heat stress, all achieved through a low-maintenance, affordable design. The Aero-Mist Desk is especially suitable for schools in warm climates, rural areas with limited power access, and institutions seeking eco-friendly innovations. In summary, the Aero-Mist Desk transforms the everyday school desk into a personal cooling station, promoting focus, comfort, and sustainability through a simple yet impactful design.

Keyword – eco-friendly, cooling solutions, classroom environment

JST083 - AGROSMART ROBO CULTURE

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ABSTRACT

The AgroSmart Robo Culture project is an innovative solution designed to improve the development and production of plant tissue culture through automation and Internet of Things (IoT) technology. Tissue culture is a vital agricultural technique for producing high-quality plants, yet conventional monitoring methods are slow, labour-intensive, and prone to error. AgroSmart Robo Culture addresses these challenges by integrating the ESP8266 microcontroller with the Blynk application, enabling remote monitoring and control of plant culture conditions using a smartphone. The system detects plant growth, estimates development progress, and continuously monitors temperature. When the temperature rises or falls beyond optimal levels, the ESP8266 sends instant alerts via the Blynk platform. In high-temperature situations, an automatic cooling fan activates to maintain stable conditions, protecting plant health and ensuring consistent growth. Key benefits of AgroSmart Robo Culture include improved efficiency in monitoring laboratory cultures, enhanced quality control through precise environmental regulation, and faster production rates by reducing reliance on manual checks. This results in the ability to produce more healthy plantlets in a shorter time frame. Portable, user-friendly, and cost-effective, the design is suitable for schools, research labs, and small-scale agricultural enterprises. By combining automation with sustainable agricultural practices, AgroSmart Robo Culture supports the need for increased food production in response to global population growth. In summary, AgroSmart Robo Culture demonstrates how IoT-based monitoring and control systems can transform plant tissue culture, offering a practical, scalable, and affordable solution to improve agricultural productivity.

Keyword - Internet of Things (IoT), tissue culture, agriculture, control system

JST084 - PLAY, LEARN, PROTECT: A GAMIFIED APPROACH TO CYBERBULLYING AWARENESS FOR CHILDREN

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ABSTRACT

Cyberbullying is a growing concern among children due to the widespread use of internet-connected devices and social media. In Malaysia and worldwide, many children experience online harassment, with verbal bullying being one of the most common forms. Increased device ownership and prolonged online activity have heightened the risk, while limited awareness and understanding of bullying leave children vulnerable. The psychological effects can be severe, including anxiety, depression, and social withdrawal, which underscores the need for early and engaging prevention measures. This product introduces a gamification-based educational tool designed to raise awareness and understanding of cyberbullying among children. Unlike conventional awareness programs, the product uses interactive scenarios, challenges, and storytelling to illustrate different forms of bullying and appropriate coping strategies. The gamified elements such as points, badges, and leaderboards encourage active participation and sustained engagement. Scenario simulations replicate realistic online interactions, allowing children to identify harmful behaviours and practice safe responses in a controlled environment. The approach combines entertainment with education, making learning both accessible and appealing for younger audiences. This design also draws from recent research showing the effectiveness of gamified learning in improving knowledge retention and behavioural change. The product provides children with practical skills to recognise, avoid, and respond to cyberbullying. It enhances digital literacy by teaching safe online practices and promoting empathy in digital interactions. Educators and parents can integrate the tool into lessons or home learning, supporting consistent digital safety education. Early exposure to these concepts can reduce the likelihood of victimisation and foster resilience. The product also supports policy and educational initiatives aimed at integrating interactive cyber safety modules into school curricula. By combining evidence-based learning strategies with an engaging format, the product serves as a practical, scalable solution for addressing cyberbullying among children in diverse learning environments.

Keywords – Cyberbullying, Gamification, Children's Education, Digital Literacy, Online Safety

JST085 - MELONIQUE: A NATURAL MOISTURIZER INFUSED WITH WATERMELON RIND

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ABSTRACT

Natural products have emerged as critical components in the cosmetics industry due to their multifunctionality, safety profile, and eco-friendliness. The increasing global demand for sustainable and health-conscious beauty products has shifted the industry's focus toward bioactive compounds derived from plants, marine life, and microorganisms. These natural ingredients offer numerous benefits, including skin rejuvenation, protection from environmental damage, and anti-aging effects, while minimizing the adverse effects associated with synthetic chemicals. This study aims to explore the potential of watermelon rind (*Citrullus lanatus*) as a natural antioxidant source for sustainable formulation of a moisturizer. Watermelon is a warm season crop that belongs to the Cucurbit family. It has been previously reported that watermelon rind possesses various therapeutic properties such as antioxidant activity, anti-inflammatory activity, antimicrobial activity, as well as protection against various diseases, due to its high content of bioactive compounds. However, the rind part is often discarded as a by-product or made into animal feed. This study aims to formulate and evaluate the potentiality of the watermelon by-products, the rind, to act as active ingredients in the formulation. A mixture of watermelon rind extract, several oils, natural waxes and other materials was used in the formulation of this natural based moisturizer. The results and the final product obtained from this study reveal the potential of this underutilized watermelon rind as promising natural antioxidant for cosmeceutical applications.

Keywords – watermelon, Citrullus lanatus, formulation, moisturizer

JST086 - FROM CRACK TO CUTLERY: “TRANSFORMING EGGSHELLS INTO BIODEGRADABLE SPOONS."

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ABSTRACT

The growing concern over plastic waste has led to the exploration of sustainable and biodegradable alternatives, particularly in single-use utensils. This study presents a home-based method for fabricating a biodegradable spoon using eggshell waste as a primary filler material. Eggshells, which are rich in calcium carbonate, were cleaned, dried, and ground into a fine powder, then combined with a simple biopolymer matrix made from cornstarch, vinegar, and cooking oil to form a moldable composite. The mixture was shaped into spoon forms using silicone molds and allowed to cure under low heat or at ambient temperatures. The resulting spoons exhibited sufficient rigidity for dry food applications and offer a viable, eco-friendly alternative to plastic cutlery. This low-cost, accessible method not only adds value to kitchen waste but also promotes environmental awareness and circular resource use in household settings.

Keywords – eggshells, plastic waste, biodegradable spoons, biopolymer composite

JST087 - APLIKASI LUASEXPRESS DALAM MATEMATIK

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ABSTRAK

Aplikasi LuasExpress merupakan aplikasi pengiraan luas bentuk geometri yang mudah digunakan dan tidak memerlukan kalkulator. Kajian mendapati masalah utama yang dihadapi murid ialah mereka memerlukan masa yang lama untuk mengira luas bentuk geometri semasa membuat latihan, dan hal ini meningkatkan kebarangkalian berlakunya kesilapan dalam pengiraan. Selain itu, kekurangan aplikasi mudah alih dalam Bahasa Melayu menyebabkan ramai murid yang tidak fasih berbahasa Inggeris tidak dapat menggunakan aplikasi Matematik sedia ada dengan baik. Di samping itu, kekurangan aplikasi pengiraan yang tidak memerlukan capaian internet juga mengehadkan akses murid dan guru. Kesimpulannya, inovasi aplikasi ini diharapkan dapat membantu murid dan guru melakukan kiraan luas bentuk geometri dengan lebih mudah dan cepat, terutamanya semasa sesi pengajaran dan pembelajaran Matematik.

Kata kunci : inovasi, luas, geometri

JST088 - IOTREK WALKWAY WITH PIEZOELECTRICITY

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ABSTRACT

The main walkway at our school presents a safety risk for students due to a lack of lighting during early morning assembly and arrival times. At the same time, the plants along this walkway require regular watering but with no staff assigned to this task, the responsibility often falls on the security guard. These challenges inspired the development of the IoTrek Walkway with Piezoelectricity, a smart, eco-friendly solution designed to address both problems simultaneously. The system is built around piezoelectric tiles that generate electricity whenever someone walks on them. This harvested energy is stored in a battery or used instantly to power LED walkway lights, ensuring safer passage for students even in low-light conditions. The same energy also operates an automated irrigation system, which waters the plants according to soil moisture readings. An Arduino Uno, chosen for its versatility and wide compatibility with sensors, serves as the central controller. It processes input from soil moisture and energy sensors, then sends real-time updates such as energy generated, soil conditions, and system status to an IoT dashboard accessible to school staff. This project not only improves safety and reduces manual labor but also demonstrates how renewable energy and smart automation can be seamlessly integrated into school infrastructure for a greener future.

Keywords – Piezoelectric, IoT, renewable energy, Arduino, sustainable

JST089 - SAFE RIDE: SMART HELMET SIGNAL SYSTEM FOR YOUNG CYCLISTS

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ABSTRACT

Road traffic injuries remain a leading cause of death among children globally, with pedestrians and cyclists being particularly vulnerable. Children walking or cycling on the road, with poor visibility and a lack of standardized safety gear, contribute to high accident rates. To address this challenge, we present SafeRide: Smart Helmet Signal System for Young Cyclists, an innovative smart helmet designed to improve visibility and safety on the road. This helmet uses LED lights on the back to show left and right turn signals and braking, just like a car or motorcycle. When the rider presses the left or right button, the helmet's lights will blink in the correct direction. This lets drivers and other road users know which way the child is turning. Additionally, when the child presses the brake button, a red brake light and a buzzer will turn on, making it easier to notify others. The helmet also has a red safety light that turns on when it is dark, making children easier to be seen at night. This helmet is easy to build, eco-friendly, and child-friendly, directly supporting SDG 3 (road safety), SDG 4 (safe education access) and SDG 11 (sustainable urban mobility). My goal is to make cycling journeys smarter and safer. Road traffic injuries remain a leading cause of death among children globally, with pedestrians and cyclists being particularly vulnerable. Children walking or cycling on the road, with poor visibility and a lack of standardized safety gear, contribute to high accident rates. To address this challenge, we present SafeRide: Smart Helmet Signal System for Young Cyclists, an innovative smart helmet designed to improve visibility and safety on the road. This helmet uses LED lights on the back to show left and right turn signals and braking, just like a car or motorcycle. When the rider presses the left or right button, the helmet's lights will blink in the correct direction. This lets drivers and other road users know which way the child is turning. Additionally, when the child presses the brake button, a red brake light and a buzzer will turn on, making it easier to notify others. The helmet also has a red safety light that turns on when it is dark, making children easier to be seen at night. This helmet is easy to build, eco-friendly, and child-friendly, directly supporting SDG 3 (road safety), SDG 4 (safe education access) and SDG 11 (sustainable urban mobility). My goal is to make cycling journeys smarter and safer.

Keywords – Road Safety, Smart Helmet, LED Lights, Child Cyclists, Traffic Injuries

JST090 - SMARTTEDUH: PARKIR TEDUH MESRA OKU

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ABSTRAK

Masjid bukan sahaja menjadi tempat ibadah, tetapi juga berfungsi sebagai pusat komuniti dan mercu tanda penting dalam masyarakat Islam. Di kebanyakan masjid, ruang parkir khas untuk Orang Kurang Upaya (OKU) telah disediakan bagi memastikan akses yang selesa. Namun begitu, kebanyakan ruang parkir ini masih menggunakan struktur statik tanpa perlindungan automatik, menyebabkan pengguna terdedah kepada hujan atau cuaca buruk. Bagi jemaah OKU, situasi ini boleh menyukarkan pergerakan terutamanya ketika hadir untuk menunaikan solat, menghadiri kelas agama, atau menghadiri aktiviti kemasyarakatan di masjid. Hal ini menunjukkan keperluan sistem parkir pintar yang mesra pengguna serta responsif terhadap keadaan cuaca. Projek SmartTeduh dibangunkan dengan tiga objektif utama. Pertama, mengesan kehadiran kenderaan di ruang parkir khas masjid menggunakan sensor ultrasonik. Kedua, mengesan keadaan hujan melalui sensor hujan yang memberikan bacaan nilai intensiti air secara terus. Ketiga, bumbung automatik akan diaktifkan untuk melindungi ruang parkir apabila kedua-dua syarat dipenuhi iaitu terdapat kenderaan di ruang parkir dan hujan sedang turun. Sistem ini dikawal sepenuhnya menggunakan papan EDU:BIT Micro:bit sebagai pengawal utama, yang mengintegrasikan sensor ultrasonik, sensor hujan, dan motor servo untuk pergerakan bumbung. Keunikan SmartTeduh terletak pada gabungan teknologi sensor yang dilengkapi automasi mekanikal yang mudah dipasang di perkarangan masjid dengan kos efektif. Reka bentuk ini bukan sahaja meningkatkan keselesaan dan keselamatan jemaah OKU, tetapi juga menyokong peranan masjid sebagai pusat komuniti yang mesra, inklusif, dan inovatif.

Kata kunci – parkir pintar, micro:bit, sensor ultrasonik, sensor hujan, sistem bumbung automatik

JST091 - IN SILICO DESIGN OF SGRNAS FOR CRISPR-CAS9 TARGETING T2DM-ASSOCIATED GENE VARIANTS

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ABSTRACT

Type 2 diabetes mellitus (T2DM), a major global health challenge, is projected to affect 1.15 billion individuals by 2050. Despite advancements, current therapies face limitations in addressing the genetic basis of T2DM. This study employed in silico tools to design single guide RNAs (sgRNAs) targeting five key genes associated with T2DM: TCF7L2, SLC30A8, KCNJ11, CDKN2A/2B, and IRS1. The goal was to optimize CRISPR-Cas9 interventions with high on-target efficiency and off-target specificity. The designed sgRNAs exhibited on-target scores ranging from 52.1 (SLC30A8) to 73.9 (KCNJ11) and off-target scores between 36.5 (CDKN2A/2B) and 79.6 (TCF7L2 and IRS1). KCNJ11 showed the highest efficiency, while TCF7L2 and IRS1 demonstrated superior specificity. Pearson correlation analysis revealed no significant relationship between on-target efficiency and off-target specificity, indicating the need for independent optimization. One-way ANOVA also showed no significant differences among sgRNAs. This suggests that sequence features, mismatch tolerance, and bulge types contributed equally to variability. Off-target analysis further indicated that mismatch tolerance and bulge types, particularly RNA bulges, increased off-target binding. Optimized sgRNAs remain a promising avenue for T2DM gene therapies despite these challenges. This research provides a computational framework for sgRNA design, enhancing precision in CRISPR-based interventions. Future efforts should validate these findings experimentally and expand to additional gene targets to support precision medicine.

Keywords: Type 2 diabetes mellitus (T2DM), CRISPR-Cas9, single guide RNA (sgRNA), gene editing, precision medicine

JST092 - SMART QURAN DISPOSAL BOX USING MICRO:BIT

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ABSTRACT

In many mosques and Islamic schools, there comes a time when old or damaged Quran pages can no longer be used. These pages are sacred and must be treated with the utmost respect. Traditionally, they are burned or buried, but before that, they must be stored somewhere safe and clean. This challenge inspired the creation of the Smart Quran Disposal Box using Micro:bit—a simple yet meaningful way to combine technology with islamic values. At the heart of the box is a Micro:bit, a small, programmable computer. Working together with sensors, it detects when Quran pages are placed inside. Conductive aluminum sheets and a pressure mechanism measure the weight of the materials, confirming their presence. Once detected, the box stores them securely in a special compartment, keeping them safe until the time comes for proper disposal. LED lights act as an alert when the box is full, letting the caretaker know it is time to empty it. The box is made from simple, affordable materials such as aluminum sheets, sponges, and crocodile clips, making it easy to build. Beyond its functionality, it serves as an opportunity for students to learn electronics, coding, and problem-solving, while also appreciating the importance of caring for something sacred. Looking ahead, the box could be improved with solar power, a buzzer for sound alerts, or a notification system that sends messages when full. It could even include a sorting mechanism to arrange Quran pages by size. The Smart Quran Disposal Box is not just an ordinary box. It connects our traditions with new technology, ensuring the Quran is always treated with love and respect in every mosque, school, and community.

Keywords – micro:bit, smart disposal box, Quran, sensor technology, Islamic value

JST093 - THE IOT OIL RECYCLER

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ABSTRACT

The IoT Oil Recycler project presents a modern, technology-driven solution to the growing problem of improper used cooking oil disposal. In many communities, high oil usage combined with a lack of convenient recycling facilities has led to environmental pollution, wasted resources, and challenges in waste management. Local communities often struggle to recycle because of limited accessible systems, leading to low recycling rates. This innovation introduces an IoT-based oil waste management machine designed to simplify and encourage the recycling process. Users can deposit used cooking oil directly into the machine, where IoT technology enables real-time monitoring, data tracking, and efficient handling of the collected oil. The system ensures that oil disposal is managed effectively while reducing human error and promoting cleaner environmental practices. The main objectives of the project are to provide accessible recycling facilities in schools, develop an IoT-powered management system to enhance efficiency in oil waste handling, and encourage active student participation in recycling initiatives. By integrating technology into environmental conservation, this project offers a sustainable approach to resource management. Furthermore, the IoT Oil Recycler aligns with multiple United Nations Sustainable Development Goals (SDGs), including SDG 13 (Climate Action), SDG 9 (Industry, Innovation, and Infrastructure), SDG 12 (Responsible Production and Consumption), and SDG 15 (Life on Land). In conclusion, this project demonstrates how smart technology can transform waste management into a more efficient, accessible, and eco-friendly process, inspiring responsible habits among young people while contributing to global sustainability.

Keywords – IoT, oil recycling, waste management, sustainability, SDGs

JST094 - ECO-FRIENDLY FIRE STARTER USING HOUSEHOLD WASTE, COW DUNG, AND BEESWAX

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ABSTRACT

Starting a fire is not something we do often, but it can be a challenge during camping trips as it depends heavily on conditions. Many types of fire starters are commonly used, such as camphor, charcoal, paraffin-soaked commercial starters, and fossil fuels like petrol. However, each has its own limitations. Some are slow to ignite, burn only for short periods, extinguish when wet, or emit chemical fumes. In addition, most commercial fire starters are non-biodegradable and environmentally unfriendly. This highlights the need to transition from non-renewable to renewable and eco-friendly fire starters. The aim of this innovation is to produce a fire starter using household waste and cow dung, enhanced with beeswax. Egg cartons were filled with dried cow dung mixed with beeswax, then cut into individual pieces once dried. Additional melted beeswax was poured over each unit to complete the product. A comparison study between this product and commercial fire starters revealed clear advantages. Our fire starter ignites in less than 30 seconds, burns for several minutes, and is waterproof—features not typically found in commercial alternatives. Being biodegradable and made from waste biomass, it is also environmentally friendly. Thus, this product not only provides an effective fire starter for camping but also reduces waste and promotes sustainable practices.

Keywords – fire starter, biodegradable, waterproof, eco-friendly, biomass

JST095 - THE LILIN NEEM

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ABSTRACT

The Lilin Neem project is a green innovation aimed at developing a natural, cost-effective mosquito repellent that is safe for both humans and the environment. The main objective of this research is to formulate a multipurpose candle that not only repels mosquitoes but also emits a soothing aroma, creating a healthier and more pleasant living environment. This project addresses the growing need for sustainable alternatives to chemical-based insect repellents, which are often linked to health and ecological risks. The methodology involves extracting neem oil from neem leaves through a simple cold-press or infusion process, followed by its incorporation into candle wax made from eco-friendly materials such as soy or beeswax. The candles are then moulded and tested in controlled environments to observe their effectiveness in repelling mosquitoes and maintaining burn stability. Lilin Neem is low-cost, easy to produce, and highly adaptable for small-scale or commercial production. Its application is suitable for households, outdoor spaces, and even emergency or rural settings with limited access to chemical repellents. The innovation promotes community-based entrepreneurship while encouraging the use of natural resources. In terms of impact, Lilin Neem contributes to environmental conservation by reducing dependency on harmful chemicals and lowering carbon emissions. It serves as an example of how traditional knowledge and modern innovation can intersect to produce practical, sustainable solutions for global challenges, especially in public health and green technology.

Keywords – Neem, mosquito, natural, repellent, sustainable

JST096 - ORGANO LIQUID PLANT BOOSTER

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ABSTRACT

Fertilizers plays an important role in plant growth. There are synthetic and natural fertilizer. However, chemical fertilizer is being used as commercial fertilizer globally. Addition of chemical compounds in chemical fertilizers causes many drawbacks to human and environment. As an alternative, food waste can be used due to uniqueness as a compost agent as it is main source of organic matters. Despite that, using organic waste could reduce food waste. Hence, the aim of this study is to produce organic fertilizers from various food waste such as banana peel, eggshell and spent tea without polluting the environment. All the waste was soaked in water for a week separately. The water is then strained. It was used as liquid fertilizer according to various ratio. The ratio of 1:1:1 of Organo Liquid Plant Booster shows excellent growth in various plants in terms of height, leave growth and flowering capabilities. In addition, it is the best booster for hydroponic plantations. Organo Liquid Plant Booster is a sustainable organic product that can be made by everyone due to the easier steps.

Keywords – Food waste, Compost agent, Liquid Fertiliser, Organic

JST097 - THE CIRCUIT CRITTERS

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ABSTRACT

Navigating the complexities of electrical circuits can be a challenging and potentially dangerous endeavor for young children. Traditional circuit-building methods often involve sharp wires and small components, posing a significant safety risk. Additionally, the high cost of materials and the intricate nature of the setup can create barriers, limiting access to this valuable educational experience for many children. This problem statement highlights a critical need to make learning about basic electrical circuits safer, more accessible, and more affordable. The main objective is to design a circuit-building system that prioritizes child safety. This will be achieved by using materials that eliminate the risk of cuts and other injuries, allowing children to explore and learn without direct supervision. Furthermore, the goal is to create a solution that is simple, intuitive, and highly accessible, enabling children from diverse backgrounds and environments to engage with the concepts of electricity. By developing a low-cost alternative, we aim to democratize access to STEM education, making it available to a broader audience. Finally, the project will also focus on environmental sustainability by using eco-friendly and reusable materials, ensuring that the learning process is not only safe and affordable but also responsible. The ultimate goal is to provide a comprehensive, safe, and engaging platform that inspires the next generation of innovators while addressing the current limitations of traditional circuit education.

Keywords – electrical circuit, circuit-building system, child safety, eco-friendly

JST098 - ORGANO BAG

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ABSTRACT

Plastic waste is one of the world's most pressing human health and environmental concerns. Focusing into agriculture sector, polybags made of polythene which used to transplant plants threaten the environment as it is made of non-biodegradable substance. Another huge problem in Malaysia is food wastage. Accumulation of food waste affects water, land and biodiversity. It is known that food waste is unique as compost agent as it is the main source of organic matters. Hence, the problems were identified and a best solution was drawn by producing plant transplanting bag which is named as Organo Bag made from coconut husk with the addition of food waste as fertilizer that makes is environmental friendly. Coconut husk was stick together using tapioca starch with crushed eggshells, tea waste and dried banana peel. It was let to dry under sunlight for a week. Coconut husk has good water retention, banana peel provides potassium, eggshell provides calcium and phosphorus, and tea waste provides nitrogen for plants. This leads to excellent growth of plants. Comparing to polybag, Organo Bag is biodegradable and act as direct fertilizer as coconut husk contains potassium. The addition of food waste makes the Organo Bag stand out when compared to commercial bags. Hence, Organo Bag is kind to planet as it is made of agricultural waste and food waste. In a way, it reduces production of waste.

Keywords – polybags, non-biodegradable, food waste, agricultural waste, direct fertilizer

JST099 - PATHFINDER CANE

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ABSTRACT

The PathFinder Cane is a smart walking stick created to help blind and visually impaired people move safely and confidently. Many blind individuals face challenges navigating their surroundings, often bumping into objects or obstacles because traditional canes only detect them upon contact. Traditional canes only detect obstacles when they touch them, which can be risky in crowded or unfamiliar areas. Inside the cane, ultrasonic sensors detect objects ahead before the user makes contact. The system is programmed using custom coding to process the sensor data and trigger gentle vibrations on the handle when an obstacle is detected. When an obstacle is detected, the handle gently vibrates to warn the user, giving them extra time to react and change direction. The design is lightweight, height-adjustable, and powered by a rechargeable battery, making it practical for daily use both indoors and outdoors. The PathFinder Cane is developed to reduce accidents, improve safety, and give blind users greater independence. It is simple, reliable, and affordable, making it a helpful tool for everyday mobility.

Keywords – visual impairment, walking stick, ultrasonic sensors

JST100 - 2 IN 1 LOOFAH HERBAL SOAP

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ABSTRACT

Skin is the largest exterior organ in the human body. It is exposed to pollutants and bacteria daily. Hence, mostly we are using commercial soaps to wash or clean ourselves. Some will use body loofah to clean their body together with commercial soaps. Commercial soaps are known to be filled with harmful chemicals such as parabens, synthetic perfumes and artificial colorings. On the other side, body loofahs are mostly made of plastic products which contains harmful chemicals too. These commercial soaps and body loofah can cause negative effect on our skin as skin has the ability to absorb chemicals in the soaps. In long run, it causes many health effects such as cancer. In fact, it could harm the environment too. Hence, the problems were identified and a best solution was drawn by producing 2 in 1Loofah Herbal Soap from turmeric, aloe vera, neem and vetiver grass root as natural loofah without polluting the environment. Vetiver grass root was made into ball like shape and placed in the soap mould. On the other side, the soap base was melted. It was then added with aloe vera gel, powdered turmeric and neem extract. The mixture is then poured in soap mould which consist of vetiver grass root. It was then let to complete cooling. 2 in1 Loofah Herbal Soap is kind to planet because it is made of organic sources, and it is biodegradable. In a way usage of natural loofah reduces plastic pollution.

Keywords – commercial soap, body loofah, organic, biodegradable

JST101 - KAWALAN VEKTOR DAN SERANGGA MELALUI PENGGUNAAN “LILIN HERBA” DAN “SEMBURAN PEMBASMI VEKTOR”

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ABSTRAK

Vektor seperti lipas, lalat dan tikus mengancam kesihatan manusia kerana menyebarkan patogen. Pelbagai produk kawalan vektor dipasarkan yang berasaskan bahan kimia. Kesan sampingan produk tersebut terhadap keselamatan dan kesihatan persekitaran menjadi kebimbangan pengguna. Justeru, inovasi produk kawalan vektor dan serangga yang dinamakan “Lilin Herba” dan “Semburan Pembasmi Vektor” telah dihasilkan bagi mengatasi isu ini. Sumber bahan organik rempah ratus yang digunakan seperti kulit kayu manis (***Cinnamomum zeylanicum*****),** bunga cengkih **(*****Syzygium aromaticum*****)** dan bunga lawang **(*****Illicium verum*****),** bahan-bahan ini dihancurkan dan ditambahkan ke dalam lilin. Sebagai tarikan, lilin herba yang dihasilkan mempunyai beberapa lapisan berwarna dan ditaburkan serbuk rempah ratus secara berselang-seli di antara setiap lapisan lilin berwarna tersebut. Apabila dinyalakan lilin herba tersebut, aroma bauan rempah ratus akan menghalau vektor dan serangga lain di samping boleh dijadikan sebagai lilin aromaterapi dan hiasan di rumah. Produk inovasi kawalan vektor disertakan sekali dengan semburan cecair yang dihasilkan daripada ekstrak daun pudina dan ditambah rempah ratus berupaya menghalau vektor dan serangga daripada mengganggu kawasan kediaman kita. Produk ini telah diuji beberapa kali dan hasilnya lilin herba yang diletakkan di dapur dan meja makan mampu mengusir lalat, lipas dan semut daripada mendekati dan mencemari sajian makanan.Tambahan lagi, semburan cecair penghalau serangga yang disembur di sekeliling dapur dan kawasan pepenjuru rumah mampu mengusir kehadiran serangga dan vektor di rumah. Kelebihan produk ini adalah ia mudah dihasilkan kerana bahan mentah utama produk ini mudah didapati, harganya yang lebih murah dan selamat digunakan tanpa kesan sampingan terhadap pengguna. Produk ini berpotensi untuk dikomersialkan kerana menggunakan bahan organik dalam penghasilannya, lebih mesra alam dan mampu mengekalkan kelestarian alam sekitar.

Kata kunci – lilin herba, semburan pembasmi vektor, bahan organik, mesra alam

JST102 - MORIHU COOKIES

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ABSTRACT

Nowadays, both kids and adults are more likely to eat fattening junk foods and snacks without understanding the health consequences of their eating habits. They are more attracted to junk food and snacks due to the appetizing taste and reasonable price. These unhealthy eating habits cause obesity, chronic illness as well as a reduction in daily performance. Hence, the transition from junk foods to healthy foods is much needed. The innovation aim is to produce Morihu cookies from natural materials such as Moringa Oleifera seeds, leaves and rice husk as there are plenty of health benefits. In addition, agricultural waste has been utilized too. Rice husk, Moringa Oleifera seeds and leaves were collected, washed, dried and powdered. Those ingredients were mixed with the addition of sugar, flour, butter and vanilla essence to form a dough. The dough was made into the desired cookie shapes and baked in the oven. These cookies are rich in nutrients since it contain Moringa Oleifera seed, leaves and rice husk. Moringa Oleifera seeds are high in fiber, a good source of iron, lower cholesterol, and promote heart health and boost the immune system. This is the first cookies made of 100% plant-based ingredients; the first cookies made of a combination of Moringa Oleifera seeds, leaves and rice husk. Hence, this is 100% organic. Rice husk has been reused from agricultural waste. Morihu cookies are rich in minerals, protein, vitamins, carbohydrates and fiber. It can be consumed by everyone.

Keywords – junk food, Moringa Oleifera, fiber, organic, agricultural waste

JST103 - HEAT INSULATOR

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ABSTRACT

Agricultural wastes from agro-based industries, such as palm oil, rubber, paddy, and wood processing factories, have increased by more than threefold. Malaysia accounts for 65.7% of the total number of identified sources of pollution in the manufacturing and agro-based sectors. Hence, there is a need to manage agricultural wastage. One of the approaches to sustainable development is reducing the amount of waste being generated and recycling the waste in a way that can be useful to the economic, social and environmental. Hence, the innovation aim is to produce a Heat Insulator using paddy husk and coconut husk as major components without polluting the environment. Paddy husk and coconut husk dry dry-blended and mixed with a natural binder made of corn starch. Then, it was poured into the mould and compressed for a day in the desired mould. Once compressed, it was letto dry under the sun for 1 week until it became hard. It can be used as a base to place hot objects mainly in the kitchen. Heat Insulator is kind to the planet because it is made of waste and natural sources and it is biodegradable. This reduces agricultural wastage.

Keywords – agricultural waste, recycling, husk, natural binder, biodegradable

JST106 - THE AUTOSTIR

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ABSTRACT

Parkinson's disease is a sickness that affects the brain and makes it harder for someone to control their movements. One of the most common symptoms is *shaky hands*. It might not sound like a big deal, but it can make simple things like writing, tying shoelaces, or stirring a drink way more difficult. Something that looks super easy to most people can turn into a messy, frustrating, and sometimes embarrassing situation. Over time, this can make a person dependent on others for help, which can feel annoying and upsetting. That's where *the autostir* comes in. It's a simple but smart gadget designed to make life easier for *people with shaky hands.* At first glance, it looks like a normal cup, but inside, it has a *small motor* that spins a stirrer. You just press a button, and it mixes your drink at the perfect speed, so it doesn't splash everywhere. It's lightweight, safe to use, and easy to clean. In addition, you can carry it anywhere such as at home, school, work, or even a cafe. The best part about the autostir is that it gives people back a bit of independence. They don't have to ask someone else to stir their drink for them, which can be a big boost of confidence. Even though it's a small change, it can make a huge difference in daily life. For someone living with *parkinson's*, having a cup that stirs by itself isn't just convenient, it's a little bit of freedom.

Keywords – Parkinson's disease, autostir cup, quality of life, shaky hands

JST108 - NEOTHERM HUB

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ABSTRACT

The Neotherm Hub is a green building that aims to save energy, reduce environmental impact, and provide maximum comfort to users. This building is very relevant to everyday life because we all go to school and use school buildings every day. Solar panels can provide alternative energy sources, such as solar energy and maximize the use of natural light and air. This building incorporates several key elements of green buildings. These include solar panels on the roof, narrow and tall windows arranged in the direction of the monsoon winds, and the use of materials such as reflective tiles and UV-filtering glass. We also ensured that the windows did not face directly into the sun, so that light could enter without excessive heat. In addition, we added security elements such as proposed locations for closed-circuit television (CCTV) cameras, outdoor lighting, and open areas that could be easily monitored. This Neotherm Hub building is equipped with an automatic solar energy system that converts sunlight into electricity without the need for manual control. This system allows the use of energy obtained directly during the day, while at night or when there is insufficient light, it will automatically switch back to a regular electricity source. The use of this system not only saves electricity costs, but also supports the concept of sustainable development that is more environmentally friendly. Key benefits include improved student alertness, enhanced thermal comfort, and a reduction in classroom heat stress. Other than that, reduce electricity payment on behalf of school. In summary, the Neotherm Hub transform the everyday school to a green building school that enjoyable, more focus on learning and comfortable.

JST109 - RESQ APP

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ABSTRACT

Emergency situations can happen anywhere, at any time. Unfortunately, traditional methods of calling for help, such as dialing emergency services or yelling for assistance, are not always reliable or effective. This is where our ResQ App takes place. This app allows users to quickly and easily alert their emergency contacts or authorities of their situation, even if they are unable to speak or move. ResQ app is connected to the phone's hardware, leveraging its sensors to ensure reliability during emergencies. ResQ can drive commercialization by partnering with insurance companies to offer policyholder benefits.

Keywords – Emergency , assistance , authorities

JST110 - DERMATRON 2.0

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ABSTRAK

Masjid merupakan pusat ibadah dan komuniti yang memerlukan dana berterusan untuk pengurusan dan aktiviti. Kaedah kutipan derma tradisional sering kurang menarik perhatian, khususnya generasi muda, selain terdedah kepada risiko kecurian. Antara masalah yang dikenal pasti termasuk jemaah tidak mengetahui lokasi tabung derma, tabung tidak sempat diedarkan ketika solat Jumaat kerana kekangan masa, serta kutipan yang kurang optimum. Projek ini membangunkan *DERMATRON 2.0 – Robot Derma Pintar* berasaskan pengawal BBC Micro:bit yang dilengkapi motor DC, papan pemacu, sensor ultrasonik, paparan LED RGB, buzzer, dan bateri boleh cas semula. Robot diprogram untuk bergerak secara automatik di laluan ditetapkan, berhenti apabila mengesan individu, memaparkan ikon derma pada LED, dan mengaktifkan sistem anti-kecurian apabila diangkat dengan memicu lampu amaran dan bunyi buzzer. Robot versi 2.0 ini ditambah baik dengan roda motor yang lebih efektif dan bentuk robot yang lebih menarik. Cabaran yang dihadapi termasuk memastikan kestabilan pergerakan, ketepatan pengesanan halangan, dan keberkesanan fungsi keselamatan tanpa mengganggu operasi. Ujian prototaip menunjukkan pergerakan lancar, pengesanan tepat sehingga 30 cm, dan tindak balas pantas sistem keselamatan. Ciri visual dan audio terbukti menarik perhatian serta meningkatkan interaksi pengguna, sekali gus berpotensi meningkatkan jumlah kutipan derma. Kesimpulannya, DERMATRON 2.0 ini membuktikan potensi teknologi interaktif dalam pengurusan derma masjid, menyokong transformasi digital perkhidmatan komuniti Islam dengan pendekatan yang mesra pengguna dan inovatif.

Kata kunci: Micro:bit, masjid pintar, robot derma, sensor ultrasonik, anti-kecurian

JST111 - PORTABLE EZBOT PENJAGAAN TANAMAN HYDROPONIK MENGGUNAKAN KONTROL PENGAWAL MICROBIT V2

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ABSTRAK

Pertanian moden kini memerlukan inovasi berasaskan teknologi bagi meningkatkan keberkesanan penjagaan tanaman, khususnya dalam sistem hidroponik yang memerlukan pemantauan rapi terhadap faktor persekitaran seperti suhu, kelembapan, dan paras air. Projek ini membangunkan Robot Penjagaan Tanaman Hydroponik Mudah Alih yang dikawal menggunakan Microbit V2. Robot ini direka bentuk untuk memantau keadaan air baja secara konsisten dan mudah dialihkan ke lokasi yang diperlukan. Fungsi utamanya termasuk mengesan tahap atau paras air dalam sistem takungan air hidroponik serta memberikan amaran atau mengaktifkan sistem pengairan apabila diperlukan. Dengan reka bentuk mudah alih, robot ini sesuai digunakan di rumah, terutama yang menggunakan petanian dan tanaman berkonsepkan hidroponik, di sekolah, atau kawasan pertanian berskala kecil. Hasil pembangunan menunjukkan bahawa robot ini dapat membantu mengurangkan kadar kematian pokok tanaman serta memastikan pertumbuhan tanaman lebih konsisten.

Kata kunci – Robot penjagaan tanaman, micro pengawal, hidroponik

JST112 - TRAVEL SHIELD – PORTABLE SECURITY SYSTEM

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ABSTRACT

This project introduces the "Travel Shield – Portable Security System," an innovative, battery-powered security device built on the micro: bit platform. Designed to provide a low-cost, user-friendly, and highly portable solution, it addresses the critical need for personal safety and asset protection in unfamiliar environments such as hotel rooms, dormitories, or shared spaces. The system integrates multiple sensors—including ultrasonic, motion (PIR), sound, and gas/smoke—to create a multi-layered detection network. Its core novelty lies in a priority-based threat detection algorithm, ensuring the most critical alarms, such as smoke detection, are processed and broadcast immediately. The system's usefulness is twofold. Firstly, it offers a real-time, local response through an audible buzzer and an on-board LCD that clearly identifies the detected threat (e.g., "SMOKE," "MOTION!"). Secondly, it features a unique dual-unit communication system, utilizing the micro: bit's radio function to send instant, real-time alerts to a separate portable receiver unit. This allows users to be notified of security events even when out of immediate earshot. The receiver unit is also equipped with a message recall feature, allowing the user to review the last warning by pressing a button. This simple and effective design enhances peace of mind, making robust security accessible to a broader audience without the complexity or cost of traditional systems. This project demonstrates a practical application of embedded systems and IoT principles for real-world problem-solving.

Keywords – Travel, safety, microbit, security, portable.

JST113 - VAULTINA – SMART JEWELLERY BOX

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ABSTRACT

VAULTINA – Smart Jewelry Box is an innovative solution designed to overcome the security and convenience limitations of traditional lock-and-key storage. This project presents a prototype that integrates an RFID (Radio-Frequency Identification) system, a microcontroller, servo motors, and an OLED display to create a compact, intelligent security device. The core innovation lies in its multi-layered protection system. Instead of a physical key, access is granted via an authenticated RFID tag, which activates servo motors controlling the lid's latch and a secondary locking mechanism. Unauthorized access attempts—identified by an unrecognized RFID tag—trigger an immediate visual alert on the OLED display and an audible alarm via a buzzer. What sets VAULTINA apart is its wireless communication feature. When a breach attempt occurs, a signal is sent to a separate micro:bit receiver, instantly notifying the owner, even when away from the device. By combining secure, keyless access with real-time remote alerts, VAULTINA offers a modern, practical solution for safeguarding personal valuables—delivering enhanced security in a sleek, compact form.

Keywords – Jewelry, Safety, Microbit, security, Smart

JST114 - SMART SHADES: SISTEM BIDAI PINTAR

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ABSTRAK

Masjid merupakan tempat ibadah dan juga zon utama umat Islam berkumpul. Kawasan dalam masjid biasanya dilengkapi pelbagai kemudahan untuk memastikan keselesaan jemaah ketika beribadah. Namun, pada waktu tertentu, cahaya matahari yang menembusi ruang atau sudut tertentu boleh menyebabkan ketidakselesaan dalam kalangan jemaah. Selain itu, pendedahan terus kepada cahaya matahari turut meningkatkan suhu dalam masjid, menjadikan suasana kurang nyaman. Bagi mengatasi isu ini, satu sistem Bidai Pintar telah dibangunkan dengan tiga objektif utama. Objektif pertama ialah menghasilkan sistem bidai automatik yang dapat mengawal suhu menggunakan sensor, motor servo dan papan mikropengawal micro:bit. Objektif kedua adalah mengawal kemasukan cahaya dan haba secara automatik bagi mewujudkan persekitaran yang lebih selesa. Objektif ketiga pula ialah mengurangkan penggunaan tenaga pendingin hawa dengan menyekat haba berlebihan dari luar. Bidai pintar ini bukan sekadar elemen hiasan moden, malah merupakan satu teknologi yang mampu meningkatkan tahap keselesaan, keselamatan dan kecekapan tenaga dalam masjid. Antara kelebihannya termasuklah membantu penjimatan elektrik, mengurangkan beban penggunaan penghawa dingin serta menurunkan suhu ruang secara efektif. Sistem ini diprogram untuk menutup secara automatik apabila cahaya matahari terlalu terik, dan boleh diselaraskan mengikut suhu persekitaran. Sistem ini dikawal sepenuhnya oleh papan mikropengawal micro:bit yang mengintegrasikan sensor suhu dan motor servo bagi menggerakkan bidai pintar. Keunikan produk ini terletak pada gabungan teknologi sensor dan automasi mekanikal yang mudah dipasang di bahagian hadapan masjid dengan kos yang fleksibel. Reka bentuk ini bukan sahaja meningkatkan keselesaan para jemaah, malah menyokong fungsi masjid sebagai ruang ibadah yang kondusif untuk komuniti Islam.

Kata kunci – bidai pintar, micro:bit, sensor suhu, bidai automatik

JST115 - KITCHEN GUARD: KITCHEN ALARM SYSTEM

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ABSTRACT

The increasing frequency of fire and gas-related incidents in residential and educational settings underscores the urgent need for a reliable early-warning safety system. KITCHEN GUARD: Kitchen Alarm System addresses this need with a low-cost, dual-unit solution capable of detecting multiple environmental hazards in real time. The system comprises a sender unit, which integrates a Micro:bit with flame, gas, and temperature sensors, and a receiver unit that alerts users to potential dangers. A key innovation lies in its robust wireless communication. By utilizing the Micro:bit's built-in radio functionality, the sender and receiver units establish a seamless, wire-free connection, enabling effective operation across different rooms or zones without the need for complex wiring. Designed with user accessibility in mind, the receiver unit replaces complex displays with the Micro:bit's integrated LED matrix, delivering intuitive visual alerts via icons and scrolling messages. Audible warnings are activated through the built-in speaker, while a physical master reset switch offers a simple, immediate way to silence alarms and reset the system to a safe state. Beyond its core safety function, KITCHEN GUARD serves as a valuable educational tool, offering practical insights into electronics, coding, and wireless systems. Its simplicity and affordability make it suitable for deployment in homes, schools, and small businesses, establishing a foundational framework for improved environmental safety.

Keywords – Kitchen Alarm, Micro:bit, Early-Warning System, Kitchen Safety, Dual-Unit System

JST116 - BITRONIX: LOKER PINTAR PELBAGAI GUNA

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ABSTRAK

Kehilangan barangan peribadi seperti kasut, telefon bimbit dan dompet sering dilaporkan berlaku di masjid, sekali gus menimbulkan rasa tidak selamat dalam kalangan jemaah. Situasi ini turut menjejaskan keselesaan serta tumpuan ketika beribadah. Bagi mengatasi isu ini, projek inovasi Bitronix: Loker Pintar Pelbagai Guna telah dibangunkan dengan mengintegrasikan teknologi Internet of Things (IoT) sebagai solusi keselamatan pintar. Loker ini direka khusus untuk menyimpan pelbagai jenis barangan peribadi dengan selamat ketika jemaah berada di dalam masjid. Sistem beroperasi melalui penjanaan kata laluan rawak yang dihantar terus ke aplikasi Telegram pengguna. Sekiranya kata laluan yang dimasukkan adalah tepat, pintu loker akan terbuka secara automatik bagi membolehkan penyimpanan barang. Jika kata laluan salah, pintu kekal terkunci dan barangan berada dalam keadaan selamat. Inovasi ini menawarkan beberapa kelebihan utama, antaranya meningkatkan keselamatan barangan peribadi, memanfaatkan teknologi digital yang mesra pengguna, serta memperkukuh kesedaran masyarakat terhadap penggunaan aplikasi mudah alih dalam kehidupan harian. Dari sudut kelestarian, projek ini menyokong Matlamat Pembangunan Mampan (SDG), khususnya SDG 9 (Industri, Inovasi dan Infrastruktur) dan SDG 16 (Keamanan, Keadilan dan Institusi Kukuh), dengan menyediakan infrastruktur digital yang selamat dan mudah diakses. Sebagai kesimpulan, Bitronix: Loker Pintar Pelbagai Guna bukan sahaja menyelesaikan masalah kehilangan barangan di masjid, malah memperlihatkan potensi besar teknologi IoT dalam memperkukuh ekosistem digital di ruang ibadah. Inovasi ini juga berpotensi untuk diperluaskan penggunaannya ke institusi lain seperti sekolah, hospital dan pusat komuniti.

Kata kunci – loker pintar, matlamat pembangunan mampan, ekosistem digital

JST117 - KIT WUDUK JUNIOR

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ABSTRAK

Kit Wuduk Junior merupakan satu inovasi pendidikan yang bertujuan memudahkan proses pengajaran wuduk kepada murid Tahun 1, khususnya bagi tajuk *"Wuduk yang Sempurna"* dalam subjek Pendidikan Islam (Rujuk DSKP Pendidikan Islam (Semakan): Standard Kandungan 4.3 Tahun Satu). Inovasi ini dibangunkan berdasarkan pemerhatian bahawa masih ramai murid comel Tahun 1 yang keliru dan tersalah aturan dalam mengangkat wuduk. Kit ini direka bentuk secara interaktif dengan menggabungkan unsur teknologi melalui Micro:bit dan servo motor. Reka bentuk fizikalnya berbentuk separa bulatan (seperti kipas), yang dibahagikan kepada enam bahagian sama besar, mewakili enam rukun wuduk. Setiap bahagian dilabelkan atau dilekatkan dengan gambar yang mewakili rukun wuduk tersebut. Servo motor yang disambungkan kepada batang lidi dan diletakkan di tengah-tengah struktur akan bertindak sebagai penunjuk. Atur cara Micro:bit yang dimuat turun menggunakan platform MakeCode akan mengawal pergerakan servo dengan sela masa yang sesuai, lalu menunjuk satu persatu kepada rukun wuduk mengikut urutan yang betul. Setelah penunjuk sampai ke rukun keenam, sistem akan mengembalikan penunjuk ke kedudukan asal secara automatik. Kit ini menggunakan bahan-bahan asas seperti bateri, wayar jumper (female-to-female/male-to-male), gam kuat, dan lidi. Inovasi ini bukan sekadar alat bantu mengajar, tetapi juga merupakan kaedah pembelajaran yang tersusun, interaktif, dan mudah diingati oleh murid. Ia sesuai digunakan di bilik darjah, masjid, mahupun di rumah — serta sesuai untuk pelajar pelbagai peringkat umur. Diharapkan inovasi ini dapat dikembangkan lagi pada masa hadapan dengan memasukkan elemen wuduk sunat serta memperkukuh penguasaan rukun wuduk dalam kalangan murid.

Kata kunci – Kit Wuduk Junior, 6 Rukun Wuduk, DSKP Pendidikan Islam(Semakan): Standard Kandungan 4.3 Tahun Satu, Pendidikan Islam

JST118 - BULETIN MASTER KALKULATOR: TRANSFORMASI DETIK CEMAS KEPADA DETIK KEMENANGAN

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ABSTRAK

Peperiksaan Matematik sering menjadi cabaran kepada pelajar kerana Bahagian A mengandungi 20 soalan objektif yang perlu diselesaikan dalam masa singkat. Hasil pemerhatian dan ujian diagnostik mendapati kebanyakan pelajar mengambil masa yang lama untuk menjawab bahagian ini, menyebabkan mereka kekurangan masa untuk Bahagian B dan C. Antara faktor utama ialah kelemahan dalam menguasai fungsi lanjutan kalkulator saintifik seperti bentuk piawai, indeks, statistik dan angka bererti. Pelajar cenderung hanya menggunakan fungsi asas tambah, tolak, darab dan bahagi, sekali gus meningkatkan risiko kesilapan pengiraan dan kegagalan menyemak semula jawapan. Bagi mengatasi isu ini, inovasi Buletin Master Kalkulator diperkenalkan sebagai bahan bantu belajar bercetak bergrafik yang memberi panduan langkah demi langkah penggunaan kalkulator Casio Classwiz. Kajian melibatkan pelajar Tingkatan 3 dilaksanakan melalui reka bentuk kualitatif dan kuantitatif. Data diperoleh daripada pra ujian 20 soalan objektif, pemerhatian serta analisis prestasi selepas pendedahan kepada penggunaan buletin. Instrumen kajian merangkumi rakaman visual, audio, imej dan analisis kandungan. Dapatan menunjukkan peningkatan signifikan dari segi kelajuan dan ketepatan menjawab. Sebahagian besar pelajar berjaya menyelesaikan soalan dalam masa 7 minit, malah ada yang mampu dalam masa 5–6 minit. Peningkatan markah pasca ujian membuktikan bahawa penguasaan fungsi seperti ENG, EXP, STAT dan SOLVE memberi impak besar terhadap prestasi. Secara keseluruhan, inovasi ini bukan sahaja membantu pelajar menjimatkan masa dan mengurangkan kesilapan, malah meningkatkan keyakinan diri dalam peperiksaan. Transformasi daripada detik cemas kepada detik kemenangan melalui penguasaan teknologi kalkulator saintifik membuktikan bahawa satu alat kecil boleh mencetuskan lonjakan markah yang signifikan serta menjadi strategi penting untuk kecemerlangan akademik.

Kata kunci – penguasaan kalkulator, pembelajaran matematik, inovasi pendidikan, kecekapan menjawab, fungsi Classwiz

JST120 - SEED CYCLE POTS

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ABSTRACT

This project is about making Seed Cycle Pots, a fun and eco-friendly way to grow plants. Instead of using plastic pots, which can harm the environment, we use old newspapers to make small pots for seeds. These pots are safe, cheap and easy to make. Best of all, they can be planted directly into the soil, where the paper will break down naturally and help the earth. The special idea of this project is turning waste newspapers into something useful for gardening. With just a few folds and rolls, the paper becomes strong enough to hold soil and water for the seed to grow. When the seedling is ready, the whole pot can go into the ground without removing the plant, so the roots are not disturbed. This product is very useful for children, schools and families. It teaches the importance of recycling and caring for nature in a simple and fun way. It also shows how we can give new life to things that are usually thrown away. By using Seed Cycle Pots, we reduce plastic waste, save money and help create a cleaner and greener world. In short, Seed Cycle Pots are an easy, creative and eco-friendly gardening solution that helps protect the environment while making planting enjoyable for everyone.

Keywords – Green gardening, Paper pots, Recycling

JST121 - SISTEM KIPAS AUTOMATIK PENJIMATAN TENAGA BERASASKAN SUHU (BREEZE-TECH)

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ABSTRAK

Penggunaan kipas secara manual di masjid sering menyebabkan pembaziran tenaga dan peningkatan kos operasi elektrik. Projek Breeze-TECH dibangunkan sebagai satu inovasi sistem kipas automatik berasaskan suhu untuk menyokong inisiatif masjid pintar dan mesra alam. Sistem ini menggunakan dua peranti micro:bit, iaitu micro:bit pertama untuk merekod bacaan suhu bilik setiap lima saat dan menghantar isyarat radio kepada micro:bit kedua yang berfungsi mengawal kipas melalui relay. Relay bertindak sebagai penghubung kuasa untuk menghidupkan atau mematikan motor kipas dengan selamat. Prototaip dibina menggunakan bahan kitar semula seperti kotak, botol plastik, dan batang aiskrim sebagai langkah penjimatan kos dan kelestarian. Ujian menunjukkan kipas akan berfungsi secara automatik apabila suhu melebihi 28°C dan berhenti apabila suhu berada pada atau di bawah ambang tersebut. Keputusan ini membuktikan keberkesanan sistem dalam mengurangkan pembaziran tenaga, meningkatkan keselesaan jemaah semasa beribadah, dan menyumbang kepada transformasi masjid pintar yang selaras dengan Matlamat Pembangunan Lestari (SDG 7). Projek ini juga memberi pendedahan kepada pelajar dalam bidang STEM serta membuka ruang penambahbaikan melalui penggunaan sensor suhu yang lebih tepat, integrasi IoT, dan aplikasi kawalan jauh. Secara keseluruhannya, Breeze-TECH berpotensi besar untuk diaplikasikan di masjid serta komuniti lain bagi mewujudkan persekitaran yang lebih efisien dan mesra alam.

Kata kunci – automasi pintar, penjimatan tenaga, micro:bit, masjid pintar, kelestarian

JST122 - SMART WATER TANK

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ABSTRAK

Salah satu cabaran utama yang sering dihadapi masjid ialah kekurangan air wudhu' ketika solat Jumaat, apabila jemaah hadir dalam jumlah yang besar dalam tempoh singkat. Keadaan ini sering menimbulkan kesulitan serta mengganggu kelancaran jemaah untuk bersiap sedia menunaikan solat. Bagi mengatasi masalah ini, inovasi *Smart Water Tank* dibangunkan bagi memastikan bekalan air wudhu' sentiasa mencukupi tanpa berlaku pembaziran. Sistem ini menggunakan pam automatik untuk menyalurkan air dari sumber ke dalam tangki, disokong oleh penderia aras air dan suis apungan *(float switch)* yang mengawal pam berdasarkan kapasiti tangki. Operasi sistem ini dikawal sepenuhnya melalui micro:bit bagi memastikan ia berfungsi secara efisien dan automatik. Impak penggunaan inovasi ini sangat signifikan kerana ia dapat menjamin kelancaran persediaan ibadah solat berjemaah, mengurangkan risiko gangguan ibadah akibat ketiadaan air, serta meningkatkan keselesaan jemaah. Selain itu, *Smart Water Tank* menyumbang kepada penjimatan air, mampu berfungsi dengan baik ketika musim kemarau atau penggunaan tinggi, dan menyokong usaha pengurusan air secara lestari. Secara keseluruhannya, inovasi ini memberi manfaat besar kepada umat Islam dengan memperkukuh kesejahteraan komuniti serta memupuk budaya penggunaan sumber yang lebih bijak dan berdaya tahan.

Kata kunci – Automasi, Solat Jumaat, Air wudhu', Penjimatan air Micro:bit

JST123 - F.A.S.T (FIRST AID SISTEM TEKNOLOGI)

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ABSTRAK

F.A.S.T merupakan satu inovasi berasaskan teknologi Micro:bit yang direka untuk bertindak sebagai sistem bantuan kecemasan pertama dengan fungsi unik dwi-input iaitu butang kecemasan dan pengecaman suara. Inovasi ini muncul sebagai jawapan kepada masalah ketiadaan alat bantuan awal serta kesukaran individu untuk mendapatkan bantuan segera dalam keadaan kecemasan, khususnya warga emas, pesakit kronik, atau mereka yang berisiko tinggi kehilangan keupayaan bergerak. Sistem ini berfungsi dengan cara apabila butang kecemasan ditekan atau apabila suara kuat seperti jeritan dikesan, sensor suara akan diaktifkan dan isyarat segera dihantar ke alat penerima Micro:bit di bilik kawalan. Melalui kaedah ini, mesej SOS dan maklumat lokasi dihantar secara wayarles tanpa memerlukan pendawaian rumit, sekali gus membolehkan bantuan segera diberikan kepada individu yang memerlukan. Keunikan F.A.S.T terletak pada penggunaan teknologi pengecaman suara yang memastikan pengguna tetap dapat menghantar isyarat kecemasan walaupun mereka tidak berupaya menekan butang. Hal ini bukan sahaja membantu warga emas, tetapi turut memberi manfaat kepada semua golongan masyarakat, termasuk pelajar, pekerja di sektor industri, dan komuniti umum. Tambahan pula, sistem ini mempunyai potensi luas untuk diperluaskan ke pelbagai sektor seperti hospital, pusat jagaan, sekolah, pejabat, kilang, serta kawasan awam yang memerlukan tindak balas segera terhadap kecemasan. Dengan kepantasan mengenal pasti lokasi dan menghantar amaran, F.A.S.T mampu menjimatkan masa kritikal dalam mencari mangsa serta meningkatkan keberkesanan bantuan kecemasan. Oleh itu, inovasi ini bukan sahaja menawarkan penyelesaian praktikal dan kos efektif, malah membuka ruang baharu dalam pembangunan sistem bantuan awal yang responsif, mesra pengguna, dan berimpak tinggi untuk kegunaan masyarakat global.

Kata kunci – first aid, mesej SOS, isyarat kecemasan, pengecaman suara, Micro:bit

JST124 - SEJADAH PINTAR & ZIKIR DIGITAL

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ABSTRAK

Projek *Sejadah Pintar* merupakan satu inovasi berteknologi pintar yang dibangunkan oleh pelajar dengan tujuan membantu umat Islam menunaikan solat secara lebih sempurna, teratur dan penuh keyakinan. Inovasi ini menyasarkan golongan warga emas, pesakit demensia, amnesia, *microsleep*, individu yang sering mengalami masalah tumpuan, kanak-kanak yang baru mempelajari solat serta golongan mualaf. Masalah utama yang dikenal pasti dalam kalangan jemaah ialah kecenderungan mereka untuk terlupa atau keliru dalam mengira bilangan rakaat akibat gangguan memori, rasa mengantuk, faktor persekitaran atau masalah kesihatan. Hal ini boleh menimbulkan waswas serta mengganggu kekhusyukan ibadah. Objektif utama pembangunan *Sejadah Pintar* adalah menyediakan penyelesaian praktikal dan mesra pengguna yang dapat membantu mengekalkan tumpuan serta memastikan bilangan rakaat yang dilaksanakan adalah tepat. Projek *Sejadah Pintar* ini dibina menggunakan kain sejadah, penderia tekanan (*touch sensor*), modul pengira digital (micro:bit), paparan LED kecil dan sumber kuasa bateri. Penderia tekanan diletakkan pada bahagian sujud untuk mengesan sentuhan dahi dan menghantar isyarat ke sistem pengira micro:bit. Setiap dua kali sujud akan dikira sebagai satu rakaat, lalu dipaparkan secara automatik melalui skrin LED mini. Selain itu, ia turut dilengkapi butang khas untuk merekod serta menyemak bilangan zikir yang dibaca oleh pengguna. Inovasi ini menawarkan beberapa kelebihan termasuk kebolehan mengira rakaat dengan tepat, meningkatkan fokus, memberikan ketenangan semasa solat, bersifat mudah alih serta mudah digunakan oleh pelbagai golongan. Projek ini telah mendapat pengiktirafan apabila berjaya meraih tempat kedua dalam Pertandingan Inovasi Masjid Pintar, sekali gus membuktikan potensinya untuk dikembangkan secara lebih meluas. Dengan cadangan penambahbaikan seperti paparan skrin yang lebih jelas dan sistem pendawaian yang lebih ringkas, *Sejadah Pintar* mempunyai prospek besar untuk dikomersialkan dan dipasarkan ke negara-negara Islam, sekali gus menjadi sumbangan bermakna dalam mendidik umat Islam tentang kepentingan menjaga kesempurnaan ibadah solat.

Kata kunci – Sejadah Pintar, Micro:bit, inovasi, Zikir, Solat

JST125 - TABUNG PINTAR DIGITAL MENGGUNAKAN MICRO:BIT

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ABSTRAK

Bukan mudah untuk menerapkan nilai murni kepada anak-anak agar bersedekah atau menderma di dalam tabung di masjid. Perkara ini kelihatan kecil, namun boleh menjadi tabiat yang dibawa sehingga dewasa kelak. Bagi menangani isu ini, satu inovasi berbentuk teknologi pintar telah dibangunkan, iaitu *Tabung Pintar Digital* menggunakan teknologi micro:bit. Objektif utama pembangunan tabung ini adalah untuk menjadikan orang yang bersedekah lebih teruja kerana terdapat ikon senyum yang dipaparkan pada micro:bit, di samping melodi yang berbunyi pada tabung tersebut. Inovasi ini juga bertujuan mendidik serta memupuk kesedaran kewangan melalui teknologi, selain mempromosikan celik digital dan STEM kepada masyarakat. Kaedah pembangunan projek ini menggunakan mikro pengawal micro:bit sebagai teras utama yang diprogramkan untuk memaparkan ikon senyum sebagai tanda kegembiraan menerima derma, manakala melodi berbunyi sebagai tanda penghargaan kepada penderma. Sekiranya berlaku cubaan kecurian terhadap tabung tersebut, sistem keselamatan akan mengeluarkan bunyi amaran bagi memberi peringatan kepada orang sekeliling. Antara alat dan bahan yang digunakan untuk membina tabung ini termasuklah micro:bit V2, papan litar, penderia, tempurung kelapa, bekas plastik dan kertas yang telah lamina (*laminate*). Dari aspek reka bentuk, tabung ini dihasilkan menggunakan bahan mesra alam, mudah alih dan kos efektif. *Tabung Pintar Digital* ini direka berbentuk kubus sebagai struktur asas bagi memberikan kestabilan dan kekuatan, manakala bahagian atas dihiasi dengan kubah yang menyerupai seni bina masjid. Manfaat projek ini adalah memudahkan urusan menderma, meningkatkan jumlah kutipan derma, menggalakkan amalan bersedekah secara berterusan, memperkukuh aspek keselamatan serta menyokong transformasi digital masjid. Tabung ini berfungsi sebagai tempat kutipan derma di masjid secara digital berbanding tabung konvensional yang digunakan pada masa kini. Secara keseluruhannya, *Tabung Pintar Digital* ini bukan sahaja membantu anak-anak memupuk budaya menderma sejak awal usia, malah berpotensi menjadi model pendidikan ke arah abad ke-21 yang menekankan digital dan inovasi dalam kehidupan individu serta masyarakat.

Kata kunci - tabung, teknologi pintar, micro:bit, transfromasi

JST128 - BARAKAH SMART BIN: INTEGRASI MICROBIT DAN APLIKASI MUDAH ALIH UNTUK TONG SAMPAH PINTAR

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ABSTRAK

Barakah Smart Bin dibangunkan sebagai sebuah inovasi pintar berasaskan teknologi mikro pengawal micro:bit yang diintegrasikan bersama sensor ultrasonik dan motor servo, serta disambungkan kepada aplikasi mudah alih melalui MIT App Inventor. Sistem ini direka untuk menyelesaikan cabaran kebersihan dan pengurusan sisa dengan lebih efisien melalui automasi dan sambungan pintar. Sensor ultrasonik berfungsi mengesan jarak objek, iaitu apabila tangan pengguna berada dalam lingkungan jarak tertentu, isyarat dihantar ke micro:bit untuk menggerakkan motor servo yang mengawal penutup tong sampah secara automatik. Proses ini membolehkan tong dibuka dan ditutup tanpa sentuhan, sekali gus meningkatkan tahap kebersihan dan meminimumkan risiko penyebaran kuman. Selain kawalan automatik, Barakah Smart Bin turut disokong oleh aplikasi mudah alih (mobile app) mesra pengguna yang dibangunkan menggunakan MIT App Inventor. Aplikasi ini berfungsi sebagai antara muka interaktif yang membolehkan pengguna memantau status sambungan Bluetooth serta mengawal fungsi asas sistem secara jarak dekat. Integrasi antara komponen perkakasan dan perisian ini menampilkan elemen Internet of Things (IoT) yang ringkas tetapi praktikal, sesuai dijadikan model inovasi dalam pendidikan. Dari aspek inovasi, Barakah Smart Bin menekankan gabungan elektronik pintar, automasi, dan pembangunan aplikasi mudah alih untuk menghasilkan satu penyelesaian holistik dalam pengurusan sisa. Selaras dengan Matlamat Pembangunan Lestari (SDG 11: Bandar dan Komuniti Mampan), projek ini menyokong usaha mewujudkan komuniti yang lebih bersih, selamat, dan lestari dengan menggalakkan penggunaan teknologi pintar bagi tujuan pengurusan sisa. Inovasi ini bukan sahaja berpotensi digunakan dalam konteks sekolah atau komuniti, malah boleh diperluaskan untuk aplikasi masa depan seperti sistem pengurusan sisa pintar di kawasan awam. Kesimpulannya, Barakah Smart Bin menonjol sebagai projek inovasi yang mengaplikasikan teknologi terkini secara kreatif dan berfungsi, menyokong agenda pendidikan STEM serta menawarkan nilai tambah dalam bidang automasi, IoT, dan pembangunan lestari.

Kata kunci – micro:bit, aplikasi mudah alih, MIT App Inventor, Internet of Things (IoT), teknologi pintar

JST129 - SISTEM PANCURAN PINTAR MASJID

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ABSTRAK

Masjid merupakan pusat komuniti yang bukan sahaja berfungsi sebagai tempat ibadah, malah menjadi lokasi penyatuan masyarakat. Namun begitu, banyak masjid berdepan dengan cabaran dalam aspek keselesaan jemaah dan kelestarian alam sekitar. Suhu dalaman yang tinggi pada waktu siang menyebabkan penggunaan penghawa dingin secara berlebihan, sekali gus meningkatkan kos elektrik. Selain itu, penyelenggaraan landskap masjid juga memerlukan penyiraman berterusan yang sering membawa kepada pembaziran air. Seiring dengan aspirasi amalan hijau dan pembangunan mampan, projek ini memperkenalkan *Sistem Pancuran Pintar Masjid* berasaskan pengawal mikro:bit bagi menangani cabaran tersebut secara inovatif. Sistem ini mengintegrasikan sensor suhu dan sensor kelembapan tanah untuk mengawal dua fungsi utama. Pertama, pancuran air pada bumbung masjid akan beroperasi secara automatik apabila suhu persekitaran mencapai tahap tertentu. Mekanisme ini berfungsi sebagai sistem penyejukan semula jadi, sekali gus mengurangkan kebergantungan terhadap penghawa dingin serta menjimatkan tenaga elektrik. Kedua, pancuran tanaman di sekitar masjid dikawal melalui bacaan kelembapan tanah, memastikan air hanya disalurkan apabila diperlukan. Dengan pendekatan ini, penggunaan air menjadi lebih efisien, mengelakkan pembaziran dan menyumbang kepada penyelenggaraan landskap hijau yang kondusif. Hasil inovasi ini dijangka memberi manfaat berganda kepada masjid. Dari sudut ekonomi, sistem ini mampu mengurangkan kos operasi melalui penjimatan tenaga dan air. Dari sudut alam sekitar, ia menyokong amalan mesra alam dengan mengurangkan pelepasan karbon serta memelihara kelestarian sumber semula jadi. Selain itu, projek ini berpotensi dijadikan model Masjid Hijau Pintar yang bukan sahaja meningkatkan keselesaan jemaah, malah menunjukkan contoh nyata integrasi teknologi dengan prinsip kelestarian. Secara keseluruhan, sistem ini membuktikan bahawa inovasi berasaskan teknologi ringkas seperti mikro:bit mampu memberi impak besar terhadap kesejahteraan komuniti dan bioteknologi. Lebih daripada itu, projek ini menzahirkan visi bahawa masjid bukan sekadar rumah ibadah, tetapi juga ikon kelestarian moden.

Kata kunci – Mico:bit, Masjid, Pennggunaan Air, Sensor Suhu, Sensor Kelembapan Tanah

JST130 - TABUNG PINTAR

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ABSTRAK

Projek ini membangunkan sebuah tabung antikecurian pintar yang direka bentuk bagi meningkatkan keselamatan dan meminimumkan risiko kecurian wang tabung di premis. Sistem ini menggunakan gabungan penderia (sensor getaran dan sensor sentuhan) bersama pengawal mikro (Micro:bit v2) untuk mengesan sebarang cubaan pencerobohan atau pergerakan luar biasa pada tabung. Apabila cubaan kecurian dikesan, sistem akan mengaktifkan penggera bunyi manakala lampu LED akan berkelip. Projek ini bertujuan memberikan penyelesaian alternatif yang lebih selamat dan inovatif berbanding tabung tradisional, di samping memupuk tabiat menabung secara moden dan berteknologi. Selain itu, projek ini selari dengan Matlamat Pembangunan Lestari (SDG 17: Kerjasama Demi Matlamat). Projek ini juga dapat memupuk semangat kerjasama dalam kalangan pengunjung premis untuk membanteras kecurian tabung di kawasan masjid. Hasil ujian menunjukkan sistem dapat berfungsi dengan baik dalam mengesan cubaan kecurian, memberikan amaran segera, serta mengekalkan keselamatan wang simpanan pengguna. Secara keseluruhannya, tabung antikecurian ini juga berpotensi membantu premis lain selaras dengan teknologi yang diaplikasikan dalam projek ini, sekali gus memupuk minat dalam bidang STEM, khususnya dalam bidang pengaturcaraan.

Kata kunci – Micro:bit, sensor getaran, sensor sentuhan, penggera, LED

YSS001 - MODEL KONSEPTUAL KOMPETENSI PENGETUA TERHADAP PELAKSANAAN PENDIDIKAN STEM

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ABSTRAK

Inovasi ini membangunkan satu model konseptual kompetensi pengetua berasaskan Teori Kompetensi Boyatzis (1982) dan Model Kompetensi Bongkah Ais (1993) bagi menyokong pelaksanaan pendidikan STEM di sekolah. Model ini menggariskan tiga domain utama kompetensi pengetua iaitu pengetahuan, kemahiran dan atribut yang saling melengkapi dalam memastikan keberkesanan kepimpinan pendidikan. Pembinaan model ini adalah sebagai respon terhadap dapatan Laporan Indeks STEM Murid (ISM) 2022 yang menunjukkan tahap pelaksanaan pendidikan STEM masih rendah, khususnya di negeri Melaka, akibat kelemahan dalam aspek kepimpinan dan komitmen guru.Model ini bertindak sebagai alat penilaian kendiri dan rujukan diagnostik yang boleh digunakan oleh pengetua, pegawai pendidikan dan pembuat dasar dalam menilai kesiapsiagaan dan keupayaan kepimpinan mereka. Ia juga berpotensi menyumbang kepada reka bentuk intervensi latihan profesional yang lebih bersasar dan berimpak tinggi. Secara teoritis, inovasi ini memperkayakan literatur pendidikan dengan menyediakan satu kerangka kompetensi berasaskan teori yang kukuh. Dari aspek praktikal, ia memberi panduan strategik kepada pemimpin sekolah dalam menambah baik kompetensi individu berdasarkan keperluan pelaksanaan STEM. Sumbangan kepada dasar pula merangkumi sokongan kepada Pelan Pembangunan Pendidikan Malaysia (PPPM 2013–2025), khususnya Anjakan 5 berkaitan kepimpinan berprestasi tinggi.Akhir sekali, inovasi ini turut menyumbang kepada persekitaran sekolah yang lebih kondusif untuk pembelajaran STEM, melalui peningkatan kesediaan dan komitmen guru, yang seterusnya akan memberi impak positif terhadap budaya STEM dalam kalangan murid. Model ini diyakini mampu menjadi asas kepada pembangunan kepimpinan pendidikan yang lebih efektif dan relevan pada masa hadapan.

Kata kunci – Kompetensi Pengetua, Pendidikan STEM, Model Konseptual, Kepimpinan Pendidikan, Intervensi Profesional

YSS002 - T&L- PBL FRAMEWORK WITH THE CARTOON CONCEPT

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ABSTRAK

Produk inovasi ini bermula penghasilannya apabila ianya melibatkan kajian yang telah dijalankan oleh pengkaji bertajuk Kerangka PdPc-PBL Berkonsepkan Kartun Mata Pelajaran Sejarah Pelajar Tingkatan Empat di Sekolah Menengah Kebangsaan (SMK) di seluruh Malaysia. Kerangka ini dibentuk menggunakan pendekatan kajian reka bentuk dan pembangunan atau *Design and Development Research* (DDR) bagi menghasilkan produk inovasi yang melibatkan tiga fasa utama iaitu analisis keperluan, reka bentuk dan pembangunan serta penilaian kebolehgunaan kerangka. Kajian ini akan membangunkan sebuah kerangka dengan pengintegrasian pendekatan *Problem-Based Learning* (PBL) berdasarkan Model McMaster University dengan Konsep Kartun dalam mata pelajaran Sejarah sekolah menengah. Pendekatan ini adalah sesuai dalam konteks kajian ini, yang akan menumpukan kepada penghasilan kerangka berteraskan PBL. Hasil kajian ini juga menunjukkan bahawa Kerangka PdPc-PBL Berkonsep Kartun Mata Pelajaran Sejarah boleh dijadikan panduan dalam menyediakan sebuah kerangka baharu dan komprehensif kepada PdPc Sejarah untuk meningkatkan penguasaan, kefahaman dan kebolehan pelajar. Makanya, ia dapat dilihat sebagai satu inisiatif yang baik apabila sebuah kajian membawa kepada penghasilan sesuatu produk yang baharu.

Kata kunci – Problem Based Learning, Berkonsepkan Kartun, Mata Pelajaran Sejarah, Design and Development Research, Model McMaster University

YSS003 - NOAH AND THE MAGIC KUIHS

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ABSTRACT

Noah and the Magic Kuih is a new way to preserve culture by using an interactive children's storybook to bring Malaysian food history to life. The story is about a young boy named Noah who finds a magical world where humanlike versions of traditional kuih live. Each one represents a different region's identity. Noah learns to like these cultural foods that he didn't like before by helping characters like Perak's Kuih Pelita and Terengganu's Kuih Seri Muka to overcome hard times. This eBook throws the important problem of cultural lack among youngsters by turning traditional desserts into fun story elements that teach heritage values through fun. The eBook utilises illustrations and interactive games, like puzzles and problem-solving tasks, to reinforce the stories about kuih. The unique method it uses is to give kuih humanlike traits while keeping real ties to their cultural and geographical roots. In the end, Noah willingly tries the kuih he once turned down, showing how effective experimental learning can be at changing a kid's mind. It uses play-based learning approaches that have been shown to help kids remember things about cultures. The eBook innovation goes beyond traditional storytelling by making a basis that could be used for other endangered cultural essentials. This opens the possibility of using multilingual versions. This work is a good example of how to protect intangible heritage while also teaching kids about cultures. It is especially useful for projects that focus on cultural sustainability and new ways of teaching.

Keywords – cultural, preserve, kuih, technology

YSS004 - YUSUF'S CAMERA ADVENTURE

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ABSTRACT

Yusuf's Camera Adventure is an illustrated ebook for kids that combines digital photography to inspire creativity, discovery, and self-expression. This story is about a boy known as Yusuf who bumps into his father's locked telephone and accidentally discovers the camera function. He starts to photograph everything in his surroundings, including his cat, flowers, and the neighbor chicken. The end of his adventure is a self-expression activity where he transforms his photographs into hand-drawn sketches. This project shows how effectively traditional art skills and digital knowledge can work together. The book is for kids and includes a strong message about being aware, imaginative, and making stories. This project expands what picture books can achieve by merging narrative, technology, and art into a kind of experience learning. The innovation refers to its integration of digital into analog storytelling, putting the narrative as both relatable and forward-thinking. This project contributes to the genre of children's literature by promoting together media exposure, self-initiative, and positive family interaction.

Keywords – creativity, self-expression, storytelling, technology

YSS005 - AN ASSESSMENT TOOL FOR MEASURING FACULTY CONTINUANCE INTENTION TO USE OPEN AND DISTANCE LEARNING (ODL)

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ABSTRACT

This paper presents a validated online assessment tool developed to measure the continuance intention of accounting faculty members to use Open and Distance Learning (ODL). Open and Distance Learning (ODL). Developed using Google Forms, the tool is grounded in an integrated framework that combines the Expectation-Confirmation Model (ECM), the Technology Acceptance Model (TAM), and Self-Determination Theory (SDT). It incorporates key constructs such as confirmation, perceived usefulness, satisfaction, and technostress creators. Its novelty lies in combining post-adoption beliefs and technostress creators to provide clearer insights into the evaluative perceptions and stress-related experiences that influence the continuance intention to use ODL. This tool promotes sustainable progress in education by combining ODL and social innovation to foster faculty continuance intention. It helps institutions collect actionable data, address lecturers' needs, and implement strategies that support the ongoing use of ODL. Its simple design and broad applicability contribute to Sustainable Development Goal 4 (SDG 4): Quality Education, which promotes equitable access, inclusive practices, and lifelong learning through effective online teaching.

Keywords – Continuance Intention, Accounting Faculty Members, Online Assessment Tool, Open and Distance Learning, Sustainable Innovation

YSS006 - ZEROBU: ZERO READY TO FIGHT AGAINST BULLYING

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ABSTRACT

An interactive application has been developed to educate society comprehensively about bullying through simulation videos, animated content, brief documentaries, and real-life victim stories that strengthen users' empathy. ZEROBU provides prevention and proper response, ZEROBU includes a guide how to report bullying cases safely, along with information on laws and regulations related to bullying, helping users understand their rights and the legal consequences for perpetrators. Interactive features such as quizzes are available to evaluate users' understanding, while the evidence upload function allows users to report bullying cases by submitting photos, videos, or supporting documents and urgent call for help and consultation with links. We hope that with our application, Indonesia will become a Zero Bullying country.

Keywords – bully, interactive application, ZEROBU

YSS007 - INNOVATIVE ONLINE SURVEY : ASSESSMENT OF ODL'S IMPACT ON GRADUATE SKILLS AND CAREER OUTCOMES

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ABSTRACT

Open and Distance Learning (ODL) has become prominent in recent years. The adoption of ODL, accelerated by the COVID-19 pandemic, ignited a new revolution in the educational landscape, particularly in today's digital era. Nevertheless, its effectiveness in generating job-ready graduates remains uncertain. Most importantly, the current workforce is heavily influenced by the Fourth Industrial Revolution, necessitating competence in a wide range of skills compatible with this industrial trend. The new educational delivery mode is now under question, particularly regarding how effectively it can develop and deliver the skills critical for today's industry and labour market. To address this, a novel online survey was created to assess how well ODL equips students with essential skills and prepares them for the future workforce. Featuring a self-assessment scale, the survey captures valuable insights into the alignment between graduate competencies and industry needs. The findings obtained for the survey aim to support the ODL educational mode continuity based on its contribution in graduates' human capital development. At the same time, strengthen the connection between academic training and real-world job expectations.

Keywords – ODL, Industry 4.0 Workforce, Skills and Competencies, Online Questionnaire Survey

YSS008 - PORTABLE SMART SINK

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ABSTRACT

The *Portable Smart Sink* is an innovative solution designed to redefine hygiene and cleanliness for outdoor enthusiasts, particularly campers and adventure seekers. One of the major challenges in outdoor activities is accessing a reliable source of clean water for hygiene purposes. Addressing this, our lightweight, foldable smart sink offers unparalleled portability and functionality, doubling as a cutting board for food preparation. Equipped with a spacious water supply bag, a wastewater collection system, and an advanced multi-stage water filtration unit, the Portable Smart Sink ensures safe, clean water in areas without plumbing. A durable carry bag ensures convenient storage and transportation, making it practical for use in remote environments. Unlike conventional sinks, its foldable design allows swift assembly anywhere, while its self-contained water system eliminates dependency on external water sources. This user-focused innovation not only meets the needs of campers but also supports broader sustainability goals by reducing plastic waste and promoting hygiene in underserved areas. Through iterative design and rigorous testing, the Portable Smart Sink emerges as a reliable, efficient, and environmentally conscious companion for anyone on the go.

Keywords: Portable Smart Sink, Hygiene, Outdoor Activities, Water Filtration, Camping

YSS009 - GreenMOORA: A WEB-BASED PYTHON TOOL FOR BIG DATA MCDM IN SUSTAINABILITY AND INNOVATION IMPACT

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ABSTRACT

GreenMOORA is a novel decision support tool and toolkit used to prioritize projects, innovations or regions based on a number of sustainability factors. Traditional decision-making procedures often face difficulties in reconciling competing goals and maintaining open, evidence-based evaluations. This system combines the functionality of big data with the Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) approach that has already been implemented in different areas including the selection of sustainable suppliers (Mubin et al., 2024). It has also been well used in terms of educational performance tests, which demonstrates its flexibility in various fields (Sinaga et al., 2022). Another key feature of GreenMOORA is its interactive interface. Instead of relying on preloaded information, it allows users to upload custom datasets, assign weights to criteria, and define benefit or cost indicators to generate normalized matrices, weighted scores, and final rankings. Also, the system offers an online graphical representation of MOORA scores and ranking that enables decision-makers to understand complex data in a clear manner, and make informed decisions. GreenMOORA can be greatly beneficial in aiding sustainability-oriented decision-making in any industry, academia, or policy-making context as it will enable the decision-maker to evaluate projects (as well as technologies or regions) in terms of their environmental, social, and economical indicators with ease. GreenMOORA increases decision-making efficiency and reliability by transforming complex multi-criteria analyses into an objective, transparent, and reproducible tool based on data. Its flexibility across diverse datasets also enhances its commercialization potential, making it a viable solution for organizations seeking to maximize innovation and sustainability outcomes.

Keywords – sustainability, MOORA method, interactive platform, real-time visualization, commercialization potential

YSS010 - UNLOCKING KNOWLEDGE: A TRANSFORMATIVE FRAMEWORK FOR BOOSTING OPEN DATA ADOPTION IN MALAYSIAN ACADEMIA

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ABSTRACT

The adoption of open data repositories (ODRs) among Malaysian academic researchers faces several barriers, including insufficient institutional support, technological challenges, and cultural resistance to data sharing. This research introduces an innovative framework that integrates the Technology Acceptance Model (TAM) and Technology-Organization-Environment (TOE) theory to address these barriers, promoting the adoption of ODRs. The framework is designed to enhance the perception of ODRs' ease of use and usefulness, while also fostering institutional and community support for open data practices. Aligned with the theme Harmony in Progress: Integrating Science, Technology, and Social Innovation for SDGs, this research aims to harmonize scientific, technological, and social efforts to achieve the Sustainable Development Goals (SDGs). By focusing on key factors such as technical infrastructure, institutional policies, and community influence, the framework offers a holistic approach to overcoming the challenges of open data adoption. The findings will provide actionable insights for academic institutions, policymakers, and researchers, advancing open science initiatives and contributing to global sustainability, quality education, and innovation efforts.

Keywords – Open Data Repositories, Adoption Framework, Malaysia, Open Science, Technology Acceptance, Sustainable Development Goals

YSS011 - SENSIBUDDY : SENSORY TOY FOR SPECIAL NEEDS CHILDREN

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ABSTRACT

Children with special needs frequently experience sensory processing challenges, heightened anxiety, and difficulties in emotional regulation. Sensory-based innovations, including therapeutic toys, have been increasingly utilized to mitigate these issues by providing calming stimuli. This study introduces Sensibuddy, a novel multi-sensory therapeutic pillow that integrates tactile stimulation with aromatherapy to promote relaxation and focus. Unlike conventional sensory toys, Sensibuddy incorporates pressure-activated lavender essential oil diffusion, offering a unique combination of tactile and olfactory stimuli. A preliminary Google Forms survey in 2 weeks duration was used to assess caregiver perceptions of sensory preferences in children with special needs. The results indicated that soothing aromatics (lavender) and soft textures were rated as "highly enjoyable" by most respondents, reinforcing the design rationale of Sensibuddy. However, a limitation of this study is that the prototype has not yet been clinically tested with children with special needs, relying instead on caregiver feedback regarding appearance and perceived suitability. Future research will involve empirical testing with children diagnosed with special needs to evaluate therapeutic efficacy. Sensibuddy holds significant potential as a non-invasive, portable, and customizable sensory aid for use in homes, schools, and clinical settings.

Keywords – sensory-based innovations, sensory toy, special need childrens, therapeutic pillow

YST001 - ADVANCED NON-PLANAR ARCHITECTURE: NANOPOROUS ALUMINA (NPA) MILLIRODS

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ABSTRACT

Nanoporous alumina (NPA) millirods were developed in a milli-sized dimension by coaxially growing a highly ordered NPA layer on aluminum (Al) wire through a two-step electrochemical anodization. This non-planar architecture addresses the brittleness and limited active sites of conventional planar NPA membranes, producing mechanically robust and three-dimensional active sites for functionalization. The fabrication strategy, which involved polytetrafluoroethylene (PTFE) coatings and transverse cutting, produced multiple identical millirods from a single Al wire, ensuring reproducibility and cost-effectiveness. Growing the NPA to a rigid Al wire substrate provided NPA with solid physical support and ease of handling. These characteristics resulted in enhanced binding-site density, rapid mass transport, and direct electrical contact, making the NPA millirods ideal for high-sensitivity electrochemical sensing and various nanomaterial applications.

Keywords – Nanoporous alumina millirod, electrochemical anodization, aluminum wire, non-planar substrates

YST002 - CHITOTHYM PULP SHIELD: PROTECT, HEAL, REGENERATE

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ABSTRACT

The primary goal of pulp capping material is to protect and maintain a viable pulp. Maintenance of vital pulp encourage its ability to lay down reparative dentin as a protective barrier to the pulp. One of the important elements in regeneration of pulp-dentin structure is pulp capping material. Calcium hydroxide has been widely used as a pulp capping material. However, it is poorly adhered to tooth structure, soluble to oral fluids and brittle. This may cause microleakage which later might lead to secondary caries and pulpal inflammation. Therefore, this project aims to fabricate a chitosan-thyme oil electrospun nanofibers as a potential element for pulp capping material. Studies found that chitosan exhibit a great potential as a pulp capping material due to its ability to stimulate reparative dentin, maintain pulpal vitality, good antimicrobial activity, adherence properties to restorative material and dentin, and can resist forces during placement of restoration. It can also mimic the mineralization process of natural tooth structure. While, thyme oil has been known as a powerful remedy for antibacterial activity and tissue healing. Nanotechnology in tissue engineering such as electrospinning may further enhance the fabrication and application of chitosan in biomedical field. Hence, incorporation of chitosan and thyme oil create a potent natural-based therapy for pulpal protection and healing.

Keywords – Regenerative dentistry, electrospinning nanofiber, pulp capping, chitosan, thyme oil

YST003 - OXYPULSE ALERT SYSTEM

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ABSTRACT

The OxyPulse Alert System is a non-invasive IoT device that provides real-time monitoring of blood oxygen levels (SpO_2) and heart rate, particularly for chronic and high-risk patients. Globally, over 262 million people suffer from asthma and 3.5 million die each year from COPD—the 4th leading cause of death. This problem is expected to worsen as the elderly population is projected to grow to 2.1 billion by 2050. In Malaysia, 71% of deaths are from chronic diseases. Among older adults, 51.1% have hypertension, 27.7% have diabetes, and 41.8% have high cholesterol. It addresses this issue using a photoplethysmography sensor with red and infrared LEDs and a photodiode. It calculates SpO_2 from light absorption and tracks heartbeat. A Wemos D1 R1 microcontroller uploads data to Google Sheets, making it easy for doctors and caregivers to access from anywhere. The system uses built-in rules to detect danger signs like SpO_2 < 90%, heart rate > 100 bpm (tachycardia), or < 60 bpm (bradycardia), and immediately sends alerts through a Telegram bot. The design focuses on being affordable, reliable, and easy to set up—using Wi-Fi, low-cost parts, and minimal maintenance. It fits well into home or hospital use, reducing nurses' workload and increasing patient confidence. With Malaysia's digital health market expected to reach USD 834.2 million by 2028, it has strong business potential. It can grow through partnerships with insurers, healthcare providers, and tech firms. By combining real-time monitoring, cloud storage, and instant alerts, it helps detect problems early, reduce costs, and improve the lives of those at risk.

Keywords – Real-time monitoring, SpO_2 and heart rate, photoplethysmography sensor, telegram alert bot, Google Sheets cloud logging

YST005 - GRAVI-WICK: A PASSIVE, ELECTRICITY-FREE AND LOW-COST DRIP IRRIGATION SYSTEM FOR OPTIMAL SOIL HYDRATION

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ABSTRACT

Maintaining optimal soil conditions is crucial for increasing agricultural productivity, particularly in areas with limited water resources. This study presents the development and implementation of a real-time soil monitoring system utilizing multimeter devices deployed across multiple farm areas. Each device measures key soil parameters: moisture, pH, temperature, electrical conductivity, and flow rate. The collected data is transmitted via the internet to a cloud server where it is stored, processed, and analyzed. The system calculates a soil readiness score based on the sensor readings, which is visualized through a user-friendly web interface for farmers and administrators. The study data demonstrates the system's ability to track spatial and temporal variations in soil conditions, offering valuable insights into land suitability and irrigation efficiency. By integrating real-time environmental sensing with cloud-based analytics, the platform supports data-driven agricultural decision-making, contributing to smarter irrigation practices and improved land management strategies.

Keywords – Low-Cost Irrigation System, Precision Agriculture, Smart farming

YST006 - ORANGE PEEL CEREAL BARS

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ABSTRACT

This project introduces a cereal bar enriched with 6% orange peel powder, designed to enhance nutritional value while contributing to sustainable food innovation. Fruit peels, particularly from citrus fruits, are often discarded despite containing fibre, vitamin C, and bioactive compounds. By incorporating orange peel powder into a cereal bar, this innovation provides a solution for food waste valorisation and functional snacking. The 6% orange peel powder cereal bar was formulated using rolled oats, chia seeds, peanut butter, and honey, without synthetic additives. The bar was evaluated through physicochemical, nutritional, and sensory analyses. The product showed improved chewiness and vitamin C content compared to the control formulation. Sensory evaluations revealed that the 6% formulation had an acceptable level of bitterness while maintaining desirable taste and texture. This product is practical for busy, health-conscious consumers and offers a new use for underutilised fruit by-products. The innovation demonstrates a feasible method to reduce food waste while introducing a nutritious, appealing cereal bar to the functional food market. The successful incorporation of orange peel into cereal bars presents a novel approach in food innovation and functional product development in Malaysia.

Keywords – orange peel powder, cereal bar, functional food, food innovation, sustainability

YST007 - AUTOMATED NURSE SCHEDULING BY USING 0-1 INTEGER LINEAR PROGRAMMING

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ABSTRACT

Efficient nurse scheduling is essential to maintaining optimal healthcare services. However, in many healthcare institutions in Malaysia, nurse scheduling is still performed manually—a method that is not only time-consuming but also prone to human error and bias. This innovation addresses the urgent need for a more reliable, systematic, and user-friendly scheduling solution by introducing an Automated Nurse Scheduling System developed using Microsoft Visual Basic for Applications (MVBA) within Microsoft Excel. This system is designed to streamline the complex task of scheduling nurses while adhering to institutional rules, labor laws, shift preferences, and fairness in shift distribution. It leverages the power of MVBA to automate the scheduling process, significantly reducing the time required for planning and eliminating the inconsistencies often associated with manual scheduling.

Keywords – Automated Nurse Schedule, Microsoft Visual Basic for Applications.

YST008 - FROM PEEL TO PROTECTION: ECO-FRIENDLY INSECT REPELLENT FROM POMELO

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ABSTRACT

Synthetic insect repellents are widely used to prevent insect-borne diseases but they often cause adverse effects on human health and the environment. In response, this poduct explores the potential of pomelo (*Citrus maxima*) peel, an abundant agricultural waste as a natural insect repellent. The peels are rich in bioactive compounds such as limonene and α-pinene which are known for their insecticidal properties. Essential oils will be extracted using hydrodistillation and soxhlet extraction and the processes will be optimized using Response Surface Methodology (RSM) for higher yield and quality. The chemical composition of the extracts will be analysed through Gas Chromatography-Mass Spectrometry (GC-MS). The repellency efficacy of the optimized extracts will be evaluated and compared with commercial insect repellents at various concentrations by using excito repellency chamber assay made from the recylce materials. Aligned with Malaysia's National Agrofood Policy (NAP 2.0) and Pesticides Act 1974 which advocate for bio-based pest control, this product supports Sustainable Development Goals (SDGs) 3 (Good Health), 12 (Responsible Consumption), and 15 (Life on Land) by reducing reliance on synthetic chemicals and valorizing waste. The product aims to produce a safe, effective and eco-friendly alternative to synthetic repellents thus contributing to public health improvement and sustainable agricultural waste utilization.

Keywords – pomelo peel, natural insect repellent, extraction, GC-MS, RSM optimisation.

YST009 - INTEGRATING IMAGE ENHANCEMENT WITH YOLO FOR IMPROVED LOW-LIGHT FACE DETECTION

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ABSTRACT

The paper introduced an innovative to enhancing face recognition performance in low-light environments using the You Only Look Once (YOLO) framework. Low light conditions pose a significant challenge to accurate facial identification, often degrading the reliability of conventional recognition systems. To address this issue, the study integrate image enhancement techniques, specifically Retinex and Zero-DCE, to strengthen the YOLO algorithm's effectiveness. Through extensive experimentation, the YOLOv8m.pt model, optimised using Stochastic Gradient Descent (SGD) at the 30th epoch, emerged as the most effective configuration. The proposed system was rigorously evaluated for both speed and accuracy, demonstrating its suitability for real-time applications. Notably, the Zero-DCE method consistently outperformed Retinex, offering faster processing times and improved recall across most test images. Under optimal conditions, the YOLO-based system achieved a mean Average Precision (mAP) of 75.8%, a Precision of 76.5%, and a Recall of 66.4%, marking a substantial advancement in face recognition capabilities for security and surveillance in low-light scenarios. Future research might be aimed at expanding scope of the data to cover more diverse situations and creating high quality API to enable broader usage and continuous learning.

Keywords: YOLO-based approach; low-light environments; face recognition; image enhancement; Zero-DCE

YST010 - MICROBIAL POTENTIAL OF BEE HONEY IN YOGURT PROCESSING

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ABSTRACT

Growing consumer health awareness of better food options and the demand for improved digestive well-being have spurred interest in maximizing the nutritional content and probiotic levels of yogurt. This study investigated the microbial potential of bee honey in yogurt processing. The three main objectives were to determine the antimicrobial activity of bee honey against common spoilage and pathogenic bacteria in yogurt, to monitor the microbial populations during yogurt fermentation and to examine the physicochemical properties of the resulting yogurt. Standard microbiological methods including total plate counts and disc-diffusion assays for assessing antimicrobial activity were employed alongside physicochemical analyses measuring pH, moisture content, Brix, protein and fat. The findings revealed that bee honey had strong antimicrobial activity at 50% and 100% concentrations with clear inhibition zones reaching up to 27.7 mm for *Staphylococcus aureus* and 15.7 mm for *Escherichia coli.* Incorporating bee honey into the yogurt fermentation process shows enhanced probiotic potential as yogurt containing 2% honey reached a bacterial count of $2.19\pm7.00 \times 10^7$ CFU/mL compared to control, $1.75\pm8.00 \times 10^9$ CFU/mL. Physicochemical analysis revealed that honey yogurt had pH values within the ideal range (4.14 - 4.35) for yogurt, reduced moisture content with more honey added (from 85.80% in control to 81.35% at 6% honey), increased Brix values (up to 13.7% with 6% honey) and slightly higher protein content (up to 3.93% at 2% honey). Notably, the fat content remained stable across all samples (about 4.4%). These observations indicate that bee honey is not only a natural sweetener but also plays an integral role in improving the safety, nutritional value and functional value of yogurt. Overall, the use of bee honey in yogurt production has great potential in developing novel functional dairy products that meet consumer demands for healthier food while supporting product safety.

Keywords – bee honey, yogurt, antimicrobial activity, lactic acid bacteria, functional food

YST011 - IMPACT OF SOURDOUGH FERMENTATION AND BAKING TEMPERATURE ON CALCIUM-FORTIFIED SOURDOUGH BREAD

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ABSTRACT

Sufficient intake of calcium-rich foods is essential for maintaining bone health, particularly among vulnerable populations. In line with this, the current study investigated the impact of sourdough fermentation and baking temperature on the nutritional and physicochemical properties of calcium-fortified sourdough bread. The main objectives were to evaluate changes in calcium content, assess the influence of microbial fermentation on mineral and physicochemical properties and examine the effect of baking temperature. Two bread formulations were involved, which include a control bread with commercial yeast and a sample bread with sourdough starter, both fortified with calcium carbonate. Calcium analysis showed that fortification increased calcium levels in dough, however, baking led to a reduction. The control experienced a 20.5% calcium loss (from 1.05 to 0.84 mg/100 g), while the sourdough sample had a 23.3% loss (from 1.00 to 0.77 mg/100 g). LAB counts increased during fermentation, 2.6×10^8 CFU/g in the starter to 8.9×10^8 CFU/g in the dough, indicating active bacterial growth. Moreover, the protein content was slightly higher in sourdough bread (11.15%) compared to control (10.64%). Gluten content in the control dropped slightly after fermentation (from 25.54 g to 23.50 g), whereas the sourdough sample showed a complete gluten degradation (from 23.03 g to 0.00 g). Texture analysis revealed that sourdough bread had higher firmness (2626.21 g) compared to control (2380.74 g), while springiness was nearly identical (63.70 mm vs. 63.72 mm). Additionally, the pH of sourdough dropped more significantly (from pH 5.85 to pH 4.95) than the control (from pH 5.91 to pH 5.72), affirming strong microbial activity. These findings demonstrate that calcium-fortified sourdough bread can be nutritionally enriched while preserving desirable texture and structure, supporting its potential as a functional food to address nutrient inadequacies.

Keywords – calcium fortification, sourdough fermentation, baking temperature, physicochemical properties, food security

YST012 - PENGGUNAAN SISA BUANGAN KACA SEBAGAI BAHAN TAMBAH AGREGAT HALUS DI DALAM KONKRIT

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ABSTRAK

Kaca adalah bahan padat yang tembus cahaya, biasanya terbuat dari pasir silika (SiO_2) yang dilebur bersama bahan lain seperti soda (natrium karbonat) dan kapur (kalsium karbonat), seterusnya didinginkan dengan cepat agar tidak membentuk kristal. Kaca digunakan secara meluas dalam kehidupan seharian dalam pelbagai cara, termasuk sebagai peralatan makan, bahan binaan, dan dalam peralatan elektronik. Kaca yang tidak effisien digunakan lagi, adalah merupakan bahan sisa buangan bagi masyarakat yang berpotensi dijadikan sebagai bahan tambah agregat halus dalam campuran konkrit. Kajian ini dijalankan untuk menilai kesan penambahan serbuk sisa buangan kaca sebagai bahan tambah dalam campuran konkrit terhadap sifat kekuatan mampatan, ketahanlasakan permukaan konkrit serta penilaian kualiti dan integriti bahan konkrit. Serbuk sisa buangan kaca yang digunakan adalah hasil daripada proses pengisaran sisa buangan kaca sehingga menjadi partikel halus, lalu ditambah ke dalam campuran konkrit pada kadar 0%, 15%, dan 25% daripada berat pasir. Penggunaan bahan ini dilihat sebagai satu pendekatan mampan yang bukan sahaja berpotensi meningkatkan prestasi konkrit, malah membantu mengurangkan sisa buangan kaca yang mencemari alam sekitar. Ujian-ujian utama yang dijalankan dalam kajian ini merangkumi ujian kekuatan mampatan konkrit pada usia 7 dan 28 hari, ujian ketahanlasakan permukaan pada usia 28 hari serta ujian penilaian kualiti dan integriti bahan konkrit juga pada usia 28 hari. Hasil kajian menunjukkan bahawa penambahan serbuk sisa buangan kaca memberi kesan kepada ciri-ciri fizikal konkrit. Bagi ujian kekuatan mampatan, ketahanlasakan permukaan konkrit serta ujian penilaian kualiti dan integriti bahan konkrit, nilai ujian meningkat pada bahan tambah sisa buangan kaca 15% dan 25%. Secara keseluruhannya, kajian ini berpotensi memberikan sumbangan kepada bidang pembinaan mampan melalui penggunaan bahan tambah daripada sisa kitar semula, serta membuka ruang untuk penambahbaikan dalam reka bentuk campuran konkrit. Dapatan kajian ini juga dapat dijadikan sebagai rujukan oleh pelajar, penyelidik, dan pihak industri dalam memilih bahan tambahan alternatif yang mesra alam dan berprestasi tinggi.

Kata kunci: Sisa Buangan Kaca, Kekuatan Mampatan, Ketahanlasakan Permukaan, Penilaian Kualiti dan Integriti Bahan

YST013 - OSSS CONNECT: OUTING SMART SCHOOL SYSTEM USING JAKOB NIELSEN'S PRINCIPLES

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ABSTRACT

Outing Smart School System (OSSS) for Sekolah Menengah Kebangsaan (SMK) Seri Gading was developed to address inefficiencies in the school's traditional, paper-based outing management process. In the past, students had to fill out outing cards, get permission from the warden in person, and have guards write down when they left and returned to the hostel. OSSS introduces a unified, role-based digital platform designed in alignment with Jakob Nielsen's usability heuristics to ensure high accessibility and intuitive interaction. The system integrates multiple functions, enabling stakeholders, including students, guardians, wardens, guards, and administrators, to handle only the relevant information to their roles. Key features include online outing requests, real-time guardian notifications, automated check-in and check-out records using student ID verification, and the ability to save outing history in a secure database. This combination of safety, speed, and openness is rarely found in existing outing management solutions. The OSSS makes things more useful by letting students submit request outings remotely, cuts down on wait times and speeds up approvals. Guardians may see their child's outing history and get instant notifications, which builds trust and makes them more involved in school events. Warden can review requests, check student records, and give out demerits when needed. Guards can also rapidly check approved outings and stop people from leaving without permission. The administrator keeps the system running smoothly and safely, managing users and keeping data safe. By digitising and streamlining the outing approval workflow, OSSS cuts down on paperwork, makes mistakes less likely, and makes it easier for everyone to talk to each other. This innovation fulfils the requirements of a growing student population while keeping everyone safe. Accountable and modernise the school's operations.

Keywords – outing system, hostel outing system, jakob nielsen, school management system

YST014 - POTENTIAL OF BORNEO INDIGENOUS SEED (*KOP* NUT) AS A NEW SOURCE OF FOOD PRODUCT

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ABSTRACT

New food sources are vital due to global challenges such as population growth, climate change, and scarcity of food resources. An indigenous plant seed known as *kop* nut among the local of Dayak's community in Sarawak Borneo has a commercial prospect for a new food product. This plant is belong to *Euphorbiacea* family, which are common with it plant seed toxin. Natural toxins are usually present in plants, but the potential toxins can be eliminated by employing a proper and suitable treatment. Here, the aim is to eradicate the seed toxicity and to establish a new food source. Heat treatment of wet or dry heat was applied to the seed. Later, the possible toxin present in the treated *kop* nut was examined using brine shrimps lethality assay (BSLA), a tiny *Crustacean* of an *Artemia*. This is crucial for acertaining that the seed is non-toxic, safe and suitable for consumption. Subsequently, a preliminary of possible prospect market of this seed among local consumer through sensory evaluation on the preference regarding taste, aroma and its suitability as nut-bean product was obtained. Result demonstrated the toxin was eliminated and no toxic effects until the maximum experimental concentration of 1g/ml when seed was treated at 100°C for 30 minutes. Sensory test demonstrated the consumer (n=30) preference on the high scale (7-9) for taste was 93.33%, aroma was 70% and suitability as a nut-bean product was 80%, thus supporting the potential of this seed for commercial nut. This shall be the first scientific evidence after validating the traditional knowledge in treating the seed plant, then sensorial attributes for possible market potential as a nut-bean product. *Kop* nut may not only served as a new source of food product in food industry, but may also served to others like pharmaceutitical and cosmetic industries.

Keywords – borneo indigenous plant, kop nut, toxic, new source food

YST015 - HARVESTPRO: INTELLIGENT PRODUCE MANAGEMENT SYSTEM

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ABSTRACT

The HarvestPro: Intelligent Produce Management System for PELADANG is an innovative web-based platform that transforms the management of vegetable crop operations from a fragmented, manual approach into an integrated, automated solution. Previously, tasks such as crop data entry, communication with wholesalers, and invoice processing were conducted informally through phone calls and messaging applications. This traditional approach led to miscommunication, delays, and challenges in accurately tracking crop sales and payments. The new system introduces a centralized platform for four major user roles: administrator, staff, crop handlers (internal farmers), and wholesalers. Staff can record crop grades and seasonal availability, update inventories, and instantly notify wholesalers. Wholesalers receive real-time crop listings, place orders, review past transactions, and access instant invoices. Administrators oversee user roles and system functions, while staff generate automated monthly sales reports for tracking trends and payment statuses. Development of the system adapted from the Waterfall Model, covering planning, analysis, design, implementation, testing, and documentation. It also adopted the principles of User-Centered Design (UCD), the system ensures ease of use for individuals with limited technical proficiency. Usability testing with experts and end-users demonstrated significant improvements in efficiency, accuracy, and stakeholder communication. Real-time access to operational data improved transparency, enabled proactive stock management, and supported data-driven decision making. Key innovations include real-time crop visibility, invoice automation, role-based access control, and automated trend reporting, collectively reducing paperwork, eliminating redundancies, and improving payment tracking. This system contributes to PELADANG's broader digital transformation goals by fostering structured workflows, enhancing productivity, and supporting sustainable growth. The project proves that even small-scale agricultural organizations can benefit from custom digital solutions tailored to their workflow needs and compete in the evolving digital economy.

Keywords – crop management, agriculture system, farmer management system, invoice tracking

YST016 - AIR-DRIVEN CONVEYOR SYSTEM FOR FRICTIONLESS MATERIAL MOVEMENT

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ABSTRACT

Belt conveyor systems, widely employed in material transport, often suffer from excessive energy consumption, maintenance needs, and wear due to friction. These challenges are most acute when transporting delicate and non-standard shapes, raising costs and lowering operational efficiency. This project seeks to develop an air conveyor system which solves these problems. Air conveyors eliminate the need for direct contact between conveyor surfaces and the items being transported, making them particularly helpful for the electronics, pharmaceuticals, and food processing industries which require strict hygiene and system integrity. These industries are also prone to excessive friction and require high maintenance. In this project, an air conveyor system prototype was designed, constructed, and subsequently tested. The prototype utilized an acrylic sheet with holes, plywood, a 700W air blower, a mount for the blower made from 3D printed parts, and some metal brackets. Moreover, tests to determine energy consumption, load, efficiency, and their material specification were conducted. Compared to belt conveyors, air conveyors showed more favourable energy expenditure over a 10-hour operational period. The system reliably transported and supported flat-bottomed items measuring from 5 cm × 5 cm to 16 cm × 16 cm and weighing from 30 grams to 500 grams. The air-driven conveyor system is an example of an innovative system where greater energy efficiency is achieved when compared to conventional systems. Mechanical wear and maintenance costs are reduced alongside improved efficiency and overall effectiveness of the system. The system can be used in material handling systems where its effectiveness and product quality are required while ensuring environmental sustainability.

Keywords – Conveyor, Air-Driven, Frictionless, 3D Printer, Material Handling

YST017 - NOTENEST: ALL YOUR NOTES IN ONE PLACE

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ABSTRACT

Note-taking is an essential learning skill in today's academic environment, yet most students struggle to organize their academic content and notes that they have created and designed. Most traditional methods, such as handwritten notes and other word processor software, they are lack organization and a note-sharing mechanism. Students increasingly rely heavily on mobile devices and technology to manage academic content. Some students may struggle to understand certain topics, and would like to expand their understanding by reading more information in additional readings or online resources. However, by using the university's official Learning Management System (LMS), academic resources are mostly provided by the lecturers. There is a lack of note-sharing activities that enable students to share the academic content with personalized notes between peers. Collaboration among students is essential, yet exchanging notes is typically unstructured and unorganized. Therefore, this project, called NoteNest, is designed for UiTM students and lecturers to provide a centralized system that gives users quick access to educational materials, offering an accessible learning system that supports students in sharing and exchanging their academic content. Come in a mobile application platform with a sleek and minimalist user interface, the system enables users to navigate through the application easily. NoteNest is also equipped with intelligent technologies to improve the note-browsing experience for students and lecturers across UiTM campuses. The application adopts some advancements in Artificial Intelligence (AI) and machine learning technologies in mobile applications to enhance user experience, such as user profiling, personalized recommendations, and managing users' preferences. Meanwhile, for effectively managing thousands of notes, a cloud-based database system is also part of this application, enabling students to upload notes in many formats. These technologies brought NoteNest as a dependable note management application with a significant step forward in offering students a centralized platform to share academic content and notes.

Keywords – collaborative learning, mobile application, note-sharing

YST018 - ALLERGIFY: MOBILE APPLICATION FOR REAL-TIME ALLERGEN DETECTION IN PACKAGED FOODS

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ABSTRACT

Food allergy is an adverse health reaction that occurs each time an individual is exposed to a specific food. It happens when the immune system mistakenly identifies a harmless food protein as a threat. Even minimal exposure to certain foods can provoke allergic reactions, from mild symptoms such as hives and itching to severe, potentially life-threatening anaphylaxis. The risks are exacerbated, particularly when consumers are unable to accurately identify allergens in packaged foods due to the inefficiency of manually reading ingredient labels and the frequent use of scientific terms or alternative ingredient names. These factors often lead to confusion and misinterpretation, increasing the likelihood of accidental allergen exposure. Based on the motivation, ALLERGIFY, a mobile application, was developed to address these challenges through real-time allergen detection powered by Optical Character Recognition (OCR) and Natural Language Processing (NLP). The application enables users to scan ingredient labels with their smartphone camera, extract text using OCR, and detect allergens by comparing tokenized text against a curated database of alternative names for common allergens. The application also integrated the Gemini AI chatbot to provide personalized guidance on food allergies. The text recognition accuracy evaluation of the system demonstrated its capability for reliable text extraction and effective allergen recognition. ALLERGIFY supports a wide user base, including individuals, parents, schools, and public health agencies, contributing to safer food choices and promoting SDG 3: Good Health and Well-being.

Keywords – allergen detection, food allergies, mobile application, NLP, OCR

YST019 - LEARNTORECYCLE: HOUSEHOLD WASTE DETECTION AND RECYCLER FINDER MOBILE APPLICATION

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ABSTRACT

Artificial Intelligence (AI) has become deeply embedded in daily life, offering numerous benefits and challenges across various domains, including education. AI-driven technologies in environmental education are indeed practical, since it supports the methods of experiential learning, building ecological awareness, and social responsibility. This project proposes the LearnToRecycle mobile application, which is designed within the advanced concept of improving household waste management. This application integrates YOLOv8, an AI-powered object detection algorithm to classify detected waste into categories such as paper, plastic, cardboard, glass, and metal. It is further enhanced with a geolocation feature using the Google Maps API, enabling users to conveniently locate nearby recycling facilities based on their current location. The initiative aims to address environmental current processes such as passive environmental education and low public awareness about recycling. This can encourage learning about proper waste sorting and sustainability practices, using an enjoyable method especially appealing to youngsters (children and adolescents) for developing eco-friendly behavior. In this way, it strengthens the correct ways of waste separation practices for an educational experience for users and contributing to the goal of environmental sustainability. The development process adopted an Adapted Waterfall methodology, which involved five phases including requirement analysis and data collection, design, implementation, testing, and documentation. The LearnToRecycle model achieved 89.1% accuracy in performance testing. The SUS results from 30 respondents yielded a score of 78.92, corresponding to the “Good” adjective rating. Future work includes expanding datasets to improve detection accuracy and reliability in real-world applications. More features such as game and specialized chatbot could also be added for further enhancement of the application.

Keywords – algorithm, maps and geolocation, mobile application, object detection, waste management, YOLOv8

YST020 - DESIGN & USER EXPERIENCE ASSESSMENT OF A MOBILE APPLICATION PROTOTYPE FOR DOCUMENTATION OF MEDICATION RELATED PROBLEMS AMONG UNDERGRADUATE PHARMACY STUDENTS (DREAMS-STUDY)

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ABSTRACT

The ability to identify, prevent and solve issues related to the ineffectiveness and unsafe use of medications is a core competency in pharmacy practice and these issues are referred to as Medication-Related Problems (MRPs). Such competency starts with good practice of MRP documentation. At present, the learning materials for this critical skill rely heavily on paper-based documentation that is fragmented and lacking real-time support during clinical clerkship which hinders the development of structured clinical reasoning among students. To address this, Rx LogPro, a mobile-based application prototype, was developed to integrate documentation, embedded clinical references, and interactive visual tools to guide students through the MRP documentation process. Using the User-Centered approach, the prototype transforms documentation from a routine, burdensome task into a reflective and educational experience. By aligning with modern learning preferences and the realities of clinical practice, Rx LogPro not only redefines how clinical pharmacy documentation is taught but also streamlines the documentation process and empowers students with confidence and competence in planning for patient medication plans. This innovation seeks to demonstrate how digital platforms can shift the educational paradigm hence making clinical experience more intuitive and future-ready.

Keywords: digital innovation, mobile health, MRP documentation, pharmacy education, student-centered learning

YST021 - BOOK BUDDY

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ABSTRACT

UiTM students always face difficulties in acquiring academic resources, such as the textbook, due to higher costs, limited availability and inefficient mechanism in purchasing, selling, or books exchange. By introducing the Book Buddy app, it gives benefit to UiTM students to get affordable academic resources related to their courses. By streamlining the textbook acquisition process, Book Buddy not only saves time and effort for students but also support the academic community. It empowers students to easily access the resources they need, enable them to focus more on their studies and less on the logistical challenges of securing the textbooks. By combining academic-specific functionality, verified student access, and environmentally conscious features, the Book Buddy app offers a comprehensive solution that goes beyond traditional secondhand book platforms that cater specifically to the needs of UiTM students.

Keywords – Book Buddy, UiTM, buying, resources, selling

YST022 - FUNDMYSTUDY: SCHOLARSHIP FINDER

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ABSTRACT

Increasing tuition fees in Malaysia hinder access to higher education for low-income students. FundMyStudy, a smartphone application, personalises scholarship searches and applications to address this issue. Using a user-centered design, it offers deadline notifications, multilingual support, and an application tracker, and AI-powered matching. Unlike conventional platforms, it provides an interactive, user-friendly interface built with Figma, enhancing usability and visual appeal. FundMyStudy improves financial decision-making and reduces missed opportunities by centralizing scholarship information and offering real-time support. Early prototype feedback highlights its potential to boost user engagement, accessibility, and application success rates. Overall, FundMyStudy can play a vital role in advancing educational equity in Malaysia.

Keywords – Figma, Higher education, Malaysia, Scholarship, Smartphone application

YST023 - FIT FIGHT MUSCLE CARD EDITION

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ABSTRACT

This project introduces the Fit Fight Muscle Card Edition, a gamified educational tool designed to enhance students' understanding of human muscular anatomy. Recognising that traditional memorisation methods might limit engagement and retention, the creators developed a versatile game comprising two decks: one with 18 Muscle Cards displaying major muscles through images and names, and another with Q&A Cards containing questions related to those muscles. During gameplay, students draw one card from each deck and respond within 30 seconds, earning points for correct answers. The approach involves small group interactions where students collaborate and compete, fostering active participation and peer learning. As students engage with the cards, they are prompted to identify muscle names, functions, and their associated movements, thereby connecting theoretical knowledge with practical application. This interactive method promotes active learning, critical thinking, and the practical application of anatomical knowledge by linking muscles to functional movements and exercises. Preliminary evaluations indicate that the game improves muscle recognition, recall, and understanding while fostering motivation and peer interaction. Its cost-effective, adaptable design caters to various learning styles, including visual, kinaesthetic, and auditory, making it a valuable supplement to traditional anatomy teaching. Overall, the *Fit Fight Muscle Card Edition* offers an engaging, effective, and innovative approach to supporting anatomy education and enhancing student learning outcomes.

Keywords – Active Recall, Anatomy, Educational Game, Muscular System, Sports Science

YST024 - ECOTOPSIS: A BIG DATA APPROACH FOR SUSTAINABLE EVALUATION AND RANKING

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ABSTRACT

This study introduces EcoTOPSIS, a web-based decision support tool designed for sustainability project evaluation under the theme *"Celebrating Innovation, Commercialisation and Publication."* The system employs the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method to rank alternatives, enabling users to upload datasets, define benefit and cost criteria, assign weights, and obtain step-by-step outputs with visualizations. By integrating big data processing with automated computation, EcoTOPSIS enhances efficiency, accuracy, and transparency compared to traditional manual Multi-Criteria Decision-Making methods. Its interactive platform supports reproducibility, provides downloadable results, and offers practical applicability in areas such as project selection, technology adoption, and resource allocation. The tool effectively bridges the gap between theoretical models and real-world applications, reduces bias and computational errors, and facilitates evidence-based decision-making aligned with sustainable development objectives.

Keywords – Big data analytics, Decision support systems, Multi-Criteria Decision-Making, Sustainability evaluation, TOPSIS method

YST025 - INNOVATIVE LOCATION-ROUTING OPTIMIZATION USING K-MEAN CLUSTERING ALGORITHM AND MTZ-TSP MODEL

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ABSTRACT

Inspired by the challenges of last-mile delivery, this project presents an innovative location–routing optimization framework that integrates the k-means clustering algorithm with the MTZ-TSP model. In the first stage, demand points are clustered, and their centroids are identified as strategic hubs. In the second stage, optimal routes between these hubs are determined to minimize travel distance, shorten delivery time, and enhance operational efficiency. The framework's performance was evaluated using three datasets. Although not applied to a real-world case, it shows strong commercial potential in sectors such as e-commerce, courier services, waste collection, public transport planning, and emergency response. This work also supports SDG 9 (Industry, Innovation, and Infrastructure) and SDG 11 (Sustainable Cities and Communities) by enabling smarter resource use, lowering environmental impact, and enhancing service delivery.

Keywords – Clustering, K-means clustering, Last-mile delivery, MTZ-TSP, Routing

YST026 - DEVELOPMENT OF THERMAL INSULATING MATERIALS FROM CORN HUSK FIBRES

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ABSTRACT

The demand for sustainable materials in textiles has driven interest in natural fibres with thermal insulation properties. Corn husk, a biodegradable agricultural by-product, is often discarded despite its potential value. This study explores corn husk fibres as a thermal insulation material. Collected husks were cleaned, chemically treated with sodium hydroxide or sulfuric acid, processed into nonwoven sheets, and tested for surface appearance, thickness, areal density, and heat retention. Results showed that the untreated sample had the greatest thickness and best heat retention, while 5% NaOH treatment produced the best fibre separation and compaction. Strong acid treatments weakened fibres and reduced insulation performance. These findings highlight corn husk fibres as a viable eco-friendly alternative to synthetic insulators.

Keywords – Corn husk, Eco-friendly, Sustainable materials, Thermal insulation

YST027 - SO-LEANYUM: FUNCTIONAL SAUCE FROM TERUNG ASAM (SOLANUM LASIOCARPUM DUNAL) WITH ENHANCED ANTIOXIDANT PROPERTIES AND ANTI-OBESITY POTENTIAL

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ABSTRACT

The growing demand for functional foods offers an opportunity to create products that support healthier lifestyles and address public health challenges such as obesity. *Solanum lasiocarpum* Dunal, locally known as '*terung asam*', is a native Bornean fruit valued in Sarawak for its culinary and medicinal uses. Rich in chlorogenic acid, it possesses strong antioxidant activity and potential anti-obesity benefits. While *terung asam* has been incorporated into product such as sauces, research on optimising these formulations remains limited. *So-LeanYum* is a novel functional sauce developed using D-optimal mixture design to maximise nutritional value while maintaining appealing sensory and storage qualities. The formulation, consisting of *terung asam* purée (98.46%), virgin coconut oil (0.73%), and garlic powder (0.81%), was optimised for total phenolic content (TPC), total flavonoid content (TFC), antioxidant capacity (DPPH assay), chlorogenic acid content, and storage stability. Its anti-obesity potential was evaluated through both in-silico and in-vitro approaches, while consumer acceptance was assessed via sensory testing against commercially available sauces. *So-LeanYum* demonstrated high chlorogenic acid content, retained strong antioxidant activity over 28 days, and exhibited promising anti-obesity effects. Sensory evaluation indicated excellent consumer acceptance. More than a flavourful condiment, *So-LeanYum* is a shelf-stable, health-promoting product that uses local ingredients, aligns with the rising demand for natural functional foods, and offers strong potential for commercialisation in both domestic and international markets.

Keywords – functional food, Solanum lasiocarpum, antioxidant activity, anti-obesity, D-optimal mixture design

YST028 - PIPERPURE: HERBAL ANTIMICROBIAL MOUTHWASH POWERED BY *PIPER BETLE* L.

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ABSTRACT

Oral diseases, driven by bacterial and fungal pathogens, continue to affect millions worldwide, leading to tooth decay, gum inflammation, and oral infections. While conventional mouthwashes such as chlorhexidine and chemical antiseptics are widely used, they often cause side effects, including tooth staining, altered taste, and mucosal irritation. In response, there is a growing global demand for safe, effective, and sustainable herbal alternatives. PIPERPURE is a novel herbal antimicrobial mouthwash formulated from ethanolic extract of Piper betle L., a plant long valued in traditional medicine for its potent antimicrobial and antioxidant properties. In this study, fresh Piper betle leaves were extracted via maceration using 95% ethanol, followed by qualitative phytochemical screening, which confirmed the presence of flavonoids, tannins, saponins, and steroids. Antimicrobial activity was evaluated using the disc-diffusion method against Staphylococcus aureus, Pseudomonas aeruginosa, and Candida albicans. The extract demonstrated moderate to significant inhibitory effects against all pathogens, with the 250 mg/mL concentration producing the largest inhibition zones, remarkably surpassing Fluconazole in antifungal activity against C. albicans. Two alcohol-free mouthwash formulations with varying extract concentrations were developed and tested for pH, foamability, appearance, stability, and sensory acceptability. Both maintained an optimal pH, clear physical appearance, and stability over time, while preserving antimicrobial potency. Taste and aroma evaluations confirmed strong user acceptability. PIPERPURE bridges traditional herbal wisdom and modern formulation science to deliver an effective, chemical-free oral care solution. With proven laboratory efficacy, stability, and consumer appeal, it addresses unmet needs in preventive dentistry while supporting sustainability and cultural heritage. The product holds strong commercialization potential in both domestic and international herbal oral care markets, offering health-conscious consumers a safe and innovative alternative to conventional mouthwashes.

Keywords – Piper betle L., herbal mouthwash, antimicrobial activity, oral pathogens, natural oral care, antifungal efficacy

YST029 - PYRRO-3: IN SILICO STUDY OF A MULTI-TARGET INHIBITOR

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ABSTRACT

Hypertension, diabetes, and bacterial infections are major global health problems, and patients with more than one of these conditions often require multiple medications. This increases cost, inconvenience, and the potential of side effects. A promising solution is a single compound hitting multiple diseases. This project conducted a virtual screening of pyrrolidine-based compounds to assess their potential as multi-target inhibitors for three key targets: angiotensin-converting enzyme (ACE) to reduce blood pressure, α-amylase to control blood sugar, and bacterial enzymes to combat infections. Pyrrolidine is well-known in medicinal chemistry for its wide range of biological activities. However, its possible role as a multi-target inhibitor is underexplored, especially through computational studies. Using molecular docking, several promising candidates were identified with strong predicted binding to all three targets. This study employs computational screening that provides a faster, more cost-effective, and greener path for the early stage of drug discovery. The findings provide valuable leads for the pharmaceutical industry, supporting the development of broad-spectrum therapeutics to improve treatment for patients with multiple health problems.

Keywords – docking, pyrrolidine, ACE, antidiabetic, antibacterial

YST030 - OPTIMIZING SCHOOL EXAMINATION TIMETABLES WITH INTEGER LINEAR PROGRAMMING

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ABSTRACT

Scheduling school examinations is a complex and time-consuming process which often required school administrators to manually arrange numerous subjects across limited period or timeslots while avoiding student and resource conflicts. This study addresses the School Examination Timetabling Problem (SETP) by developing an optimization model using Integer Linear Programming (ILP) to create efficient and conflict free examination schedules. The study utilizes real data from a secondary school in Kelantan and applies the ILP model using Microsoft Excel's Solver. The data consist of the timetabling of 28 examinations, each with a duration ranging from 1 to 2.5 hours, for three students' classes over nine days. The study develops an ILP model with the objective function to maximize the effective allocation of examination hours while considering two hard constraints and one soft constraint. All examinations are scheduled exactly once and the limit number of examinations per day are considered as the hard constraints in this study. For a more convenient examination timetable, the soft constraint includes grouping certain examinations on the same day. Results demonstrate the applicability of ILP in examination timetabling problem especially in school and offers a practical solution that can be adapted by other academic institutions facing similar scheduling challenges.

Keywords – School Examination Timetabling Problem (SETP), Integer Linear Programming (ILP), Microsoft Excel's Solver

YST031 - BLOOMYBURST

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ABSTRACT

Most commercialized popping boba incorporates synthetic colorants to influence consumer purchasing decisions and elevate brand positioning. However, this usage of synthetic dye can lead to many global health risks such as allergies, cancer, and Attention-deficit/hyperactivity disorder (ADHD). BloomyBurst contains 26.95 mg GAE/g of Total Phenolic, 0.89 mg QE/g of Total Flavonoid Compound (TFC), and 0.59 mg/kg of Total Monomeric Anthocyanin (TMAC). This product also exhibited strong antioxidant activities based on DPPH and ABTS radical scavenging activities, which are 81.34% and 31.52%, respectively. BloomyBurst displayed as a vibrant pearl with L* (10.33±0.26) C* (9.46±0.06) and h° (338.19±1.13) values, making it more appealing for the targeted customers, who are kids and the beverage industry. Offered at a reasonable and affordable price (RM 8.20 for 500g), BloomyBurst can penetrate the market and gain a strategic advantage over its competitors based on the benefits offered.

Keywords – Popping Boba, natural colorant, natural antioxidant, calamansi lime and butterfly pea flower

YST032 - DEVELOPMENT OF AN AGROROVER FOR SMART AGRICULTURAL AUTOMATION TO ENHANCE PRODUCTIVITY USING WIRELESS COMMUNICATION

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ABSTRACT

Modern agriculture is confronted by challenges including labor shortages, high technology costs, and unreliable rural power infrastructure. This thesis presents the design and development of AgroRover, an autonomous ESP32-based robotic system engineered for automated seeding operations in agricultural fields. The AgroRover integrates a linear actuator for soil penetration, a precision seed dispensing motor, and an ultrasonic sensor for real-time obstacle detection and avoidance. System monitoring and control are implemented via the Blynk IoT platform, facilitating remote operation and live data tracking through a smartphone interface. Experimental results demonstrate the system's rapid response capability, achieving an average obstacle avoidance reaction time of 782 ms and a control response time that increases linearly with distance, reaching 197 ms at 15 meters. Path-following accuracy is validated by an average drift of only 2.7 mm over a 3-meter trajectory, indicating high-precision navigation. Furthermore, battery performance analysis shows stable operation, with battery depletion curves for both operating modes confirming over 6 hours of continuous field deployment per charge. The robust wireless connectivity, reliable actuation, and scalable modular design support cost-effective implementation and future integration with renewable energy solutions. These results underscore AgroRover's potential as a practical, efficient, and scalable platform for next-generation, technology-driven precision agriculture.

Keywords – Smart AgroRover, Precision Agriculture, Autonomous Field Robot, IoT-based Agricultural Automation, Obstacle Avoidance Robotics

YST033 - ORANGE PEELS AND BASIL LEAVES HERBAL TEA

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ABSTRACT

The increasing demand for natural and health-promoting beverages has led to this innovation of a herbal tea infusion with orange peel powder (OPP) and basil leaf powder (BLP). The project aims to create a functional herbal tea drink using these two materials with the delivery of health benefits as well as protecting the environment by the utilization of fruit peels. A 50:50 OPP-BLP blend was prepared and evaluated for physicochemical properties, antioxidant activity, and sensory acceptability, with green tea serving as the control. The OPP-BLP herbal tea exhibited a golden-brown hue. Total phenolic content (44.71 mg GAE/L) and antioxidant activity (1700 µmol TE/L) of OPP-BLP herbal tea, though slightly lower than green tea, remained within a range that suggests meaningful health benefits. Sensory evaluation confirmed that the OPP-BLP herbal tea was lower in color and odor that may likely due to panelist familiarity with green tea but the OPP-BLP herbal tea scored higher for flavor, aftertaste and overall acceptability, reflecting a pleasing and harmonious flavor experience from the citrusy and aromatic herbal infusion. The innovation lies in waste valorization and the novel combination of herbal ingredients, offering a sustainable alternative to traditional teas. This product addresses consumer demand for natural, functional, and eco-friendly beverages, positioning it as a promising prouct in the herbal tea market.

Keywords – herbal tea infusion, orange peels, basil leaves, sustainable product development

YST034 - DAILEETOX (POMEGRANATE BOTANICAL DRINK)

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ABSTRACT

This report details the development of Daileetox, a novel pomegranate botanical beverage in an easy-to-use premix powder format. Infused with strawberry, red dates, ginger and moringa, this innovative product responds to the rising consumer demand for natural, health-conscious, and functional beverages that blend traditional herbal wisdom with modern convenience. The novelty of Daileetox lies in its distinctive, synergistic blend of natural ingredients, carefully selected for their complementary health benefits and unique flavor profile. This formula is specifically designed to support the body's natural detoxification processes, while also providing a rich array of antioxidants, essential vitamins like Vitamin C from strawberry, minerals, and anti-inflammatory compounds from superfoods like moringa. Pomegranate contributes valuable nutrients such as hydrolysable tannins and anthocyanins, further enhancing cellular health and protection against free radicals. Daileetox stands out as a clean-label beverage, devoid of artificial colors, flavors, and preservatives, offering a sweet, tangy, and mildly spicy taste. The usefulness of Daileetox is multifaceted. Its convenient premix powder form ensures portability and quick preparation, making it ideal for busy lifestyles, including working professionals, students, and the elderly. It serves as a versatile functional beverage, perfect for a morning health boost, mid-day refreshment, or post-meal digestive aid. Furthermore, Daileetox is intentionally priced to be accessible without compromising quality, making wellness more affordable.

Keywords – Botanical Beverage, Functional Drink, Detoxification, Natural Ingredients, Wellness

YST035 - TWO-STEP ANODIZATION APPROACH FOR FABRICATING NANOPOROUS ALUMINA ON ALUMINUM HOLLOW TUBES

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ABSTRACT

This study reports the fabrication of nanoporous anodic aluminum oxide (AAO) layers on both the inner and outer surfaces of aluminum (Al) hollow tubes using a modified two-step anodization process. Unlike conventional AAO synthesis performed on planar or single-surface cylindrical substrates, the present method enables simultaneous anodization of concave and convex surfaces within a single system. The novelty of this work lies in the dual-surface anodization approach for hollow tubular substrates, achieving hexagonal nanoporous morphology across geometrically distinct surfaces without requiring separate processing steps. This method expands the applicability of AAO beyond traditional planar templates, offering a scalable route for complex 3D architectures. The resulting dual-surface AAO tubes hold significant potential for advanced applications, including multifunctional membranes, high-surface-area catalytic supports, and fluidic devices where inside–outside accessibility is critical. Their large surface area, high pore uniformity, and robust structure make them suitable for separation processes, sensing platforms, and energy storage devices. By enabling efficient and uniform anodization of both internal and external surfaces, this research provides a pathway for integrating AAO into next-generation tubular devices, offering enhanced performance in chemical, environmental, and biomedical applications.

Keywords – two-step anodization, AAO nanoporous structure, hollow tube

PSS001 - S-ILTIZAM: ISLAMIC MICRO SAVING AND LEARNING TOOL FOR UNIVERSITY STUDENTS

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ABSTRACT

University students in Malaysia, particularly those from low- to middle-income backgrounds, face mounting financial pressures without access to structured financial literacy or culturally aligned saving mechanisms. In response to this gap, *S-Iltizam* is introduced as a mobile-based Islamic micro-saving and learning tool tailored for Muslim university students. Grounded in Maqasid al-Shariah and Islamic financial ethics, the app integrates practical digital saving features with spiritual development components to foster holistic student well-being. Key modules within *S-Iltizam* include a goal-based savings tracker such as for tuition, umrah, sadaqah, a daily Quran reading and zikir reminder system, a visual dashboard summarizing financial growth, and personalized encouragements embedded with Islamic values. The design reflects a user-centred approach, catering to the Gen Z digital lifestyle while reinforcing Islamic behavioural discipline. Unlike conventional financial apps, *S-Iltizam* offers a dual developmental track—financial and spiritual—thus positioning itself uniquely within the Shariah-compliant fintech landscape. The novelty lies in how it gamifies saving behaviour with Islamic teachings, providing not only functional support for money management but also enhancing users' spiritual connection through daily engagement. Preliminary pilot tests with university students demonstrated increased saving frequency, improved religious consistency, and positive feedback on app usability and motivation features. The project contributes to the national agenda of financial inclusion and supports United Nations SDGs, particularly SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth). *S-Iltizam* is envisioned as a scalable, ethical fintech solution with potential to be adopted by higher education institutions, zakat bodies, and Islamic schools. It represents a meaningful innovation that bridges modern technology with Islamic pedagogy to empower the next generation of financially responsible, spiritually conscious youth.

Keywords – Islamic Financial Literacy, Micro-Saving App, Shariah-Compliant Fintech, University Students, Digital Islamic Learning

PSS002 - FSPPP EXAM KIT 2.0: DEVELOPMENT OF A MOBILE/WEB-BASED EXAM INFORMATION SYSTEM

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ABSTRACT

The FSPPP Exam Kit is an innovative initiative introduced by the Faculty of Administrative Science and Policy Studies (FSPPP), Universiti Teknologi MARA (UiTM), to enhance students' access to final examination information. Following the successful implementation of Phase by featuring QR code-enabled access to essential exam documents and phase 2 proposes the development of a comprehensive mobile and web-based application. This next phase aims to provide a centralized, interactive, and real-time platform tailored to the academic needs of FSPPP students and administrators. The proposed application will feature personalized dashboards, downloadable exam documents, real-time updates, examination schedules, and venue locators. This transformation addresses current limitations such as lack of personalization, fragmented communication, and dependency on static QR-based systems. With a focus on user friendliness and accessibility, the platform will leverage technologies such as React Native for cross-platform compatibility and Firebase for secure data management. The target users include FSPPP students, academic staff and admin staff. Phase 2 of the FSPPP Exam Kit not only supports UiTM's digital transformation agenda but also responds to the growing need for sustainable, paperless, and responsive academic solutions. The expected outcomes include enhanced student satisfaction, reduced administrative workload, and streamlined exam operations. This project sets a precedent for future innovations within the faculty and beyond, reinforcing FSPPP's commitment to academic excellence and student success.

Keywords – FSPPP, Exam Kit, Students, Education, Examination

PSS003 - i-INTEGRATED AUDIT MANAGEMENT SYSTEM

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ABSTRACT

This study evaluates the content validity and implementation potential of the IAB Integrated Audit Management System (IIAMS), a digital platform developed by the Aminuddin Baki Institute (IAB) to enhance internal audit management through the integration of Lean principles and ISO 9001:2015 standards. Using a quantitative approach, seven experts assessed IIAMS via the Content Validity Index (CVI) and SPSS analysis, with all items scoring above the 0.78 threshold, indicating high validity. Mean scores for usability, interface, and content suitability ranged from 4.2 to 4.6, reflecting strong user acceptance despite minor concerns over smartphone access. IIAMS improves audit transparency, efficiency, and accountability by enabling real-time document upload, retrieval, and monitoring. Beyond compliance, it supports continuous improvement and data-driven decision-making. The system demonstrates strong potential for replication across other Ministry of Education training institutes, positioning it as a benchmark for digital innovation in educational governance and national education management transformation.

Keywords **– audit management, digital systems, Lean, ISO 9001, IIAMS, content validity**

PSS004 - GAME-INTEGRATED COMMUNICATIVE FRAMEWORK: TRANSFORMING ESL SPEAKING THROUGH MAINSTREAM DIGITAL GAMING

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ABSTRACT

This paper introduces the *Game-Integrated Communicative Framework* (GICF), an innovative solution to persistent challenges in Malaysian tertiary ESL education: low speaking confidence, lack of authentic practice, and difficulty with strategic communication tasks like giving instructions and leading discussions. Moving beyond traditional teacher-centered methods, GICF systematically integrates the popular cooperative game *Overcooked* (on the Nintendo Switch) into a structured Task-Based Language Teaching (TBLT) cycle. This creates a high-engagement, low-anxiety environment where learners practise imperative use, sequencing, and negotiation in time-sensitive collaborative scenarios. A mixed-methods pilot study with 40 A2-B1 CEFR learners at UiTM Sarawak demonstrated significant outcomes: increased classroom engagement, reduced speaking anxiety, and improved accuracy in functional language use. By merging theory-driven pedagogy with the motivational power of gaming, GICF addresses both linguistic and affective barriers to fluency. Furthermore, it presents substantial commercial potential for scalable educational products, aligning with national educational goals and advancing Sustainable Development Goal 4: Quality Education.

Keywords – ESL Speaking, Gamification, Digital Game-Based Learning, Leadership Language, Instruction-Giving

PSS005 - GLOBAL VOICES: AI PERSONA LAB (CONSUMER PERSONA CHATBOT)

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ABSTRACT

Global Voices: AI Persona Lab is an educational innovation that transforms theoretical learning into dynamic, experiential simulations using AI-powered personas. Initially applied in a consumer behavior module in Malaysian higher education, the Lab enables students to interact with hyper-realistic AI chatbots representing diverse cultural, generational, and consumer profiles. These personas exhibit nuanced decision-making, emotional depth, and cultural authenticity, allowing students to practice inquiry-driven engagement in a low-stakes yet realistic environment. The platform integrates GPT-4o for natural language processing, ElevenLabs for voice synthesis, and Deepgram for speech-to-text, supporting unscripted, adaptive conversations. Grounded in Kolb's Experiential Learning Theory, the Lab guides students through insight gathering, analysis, strategy design, and virtual marketplace testing, fostering empathy, cross-cultural competency, and applied problem-solving. Its tool-agnostic, web-based design ensures accessibility and scalability across disciplines such as healthcare, tourism, and design. The innovation has yielded measurable improvements in student engagement and performance, positioning it as a adaptable, human-centered model for AI-enhanced education.

Keywords – generative AI, experiential learning, cross-cultural simulation, gamified pedagogy

PSS006 - VISUALIZING CONTRADICTIONS: AN INTERACTIVE COMIC FOR LEARNING PHYSICAL CONTRADICTION

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ABSTRACT

This study developed an Interactive Learning Comic to teach Physical Contradiction in Form 2 Design and Technology. Using the ADDIE instructional design model and constructivist learning principles, the comic was designed to enhance student engagement and conceptual understanding. Three phases guided the project: identifying instructional requirements, designing and developing the comic, and evaluating its usability through expert interviews. Three subject experts affirmed the comic's effectiveness in simplifying complex concepts via visual storytelling, interactivity, and relatable content. The module offers a practical alternative to traditional textbooks and supports both student learning and teacher instruction. Future work will extend this approach to develop a comic module on time separation inventive principles.

Keywords – Interactive Learning Comic, Design and Technology, Physical Contradiction, Inventive Principles

PSS007 - i-FIQH EASY

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ABSTRAK

Pengajaran kursus Ekonomi dan Kewangan Islam melibatkan penggunaan pelbagai istilah teknikal dalam bahasa Arab seperti *Murabahah, Musyarakah, Mudarabah, Wakalah* dan sebagainya. Istilah-istilah ini menjadi cabaran kepada pelajar yang tidak mempunyai asas bahasa Arab, termasuk pelajar bukan Islam, sehingga menjejaskan penguasaan konsep asas perbankan Islam dan keberkesanan pembelajaran. Bagi mengatasi isu ini, projek inovasi i-FIQH EASY dibangunkan sebagai bahan bantu mengajar berasaskan kecerdasan buatan (AI) khusus untuk topik *Islamic Banking Product*. Inovasi berbentuk komik bergambar ini menyampaikan kandungan melalui jalan cerita yang menarik, dilengkapi sebutan istilah, maksud ringkas dalam Bahasa Melayu/Inggeris, serta contoh penggunaannya dalam situasi harian dan contoh aplikasi di bank. Pembangunan i-FIQH EASY menggunakan gabungan aplikasi Gemini, Canva AI dan Comica, dengan pengesahan kandungan oleh dua orang pakar bidang. Ujian kebolehgunaan menunjukkan respon positif daripada pelajar, termasuk pelajar bukan Islam, yang mendapati i-FIQH EASY membantu mereka memahami istilah teknikal dan meningkatkan minat terhadap subjek. Inovasi ini membolehkan pelajar mengakses pembelajaran di mana-mana sahaja, serta berpotensi diperluas kepada kursus seperti CTU241 dan CTU351 di UiTM, subjek berkaitan di IPTA lain, serta dikembangkan kepada modul video bersiri atau aplikasi pembelajaran pintar untuk pengalaman yang lebih interaktif.

Kata kunci – Kewangan Islam, istilah Arab, Fiqh, inovasi pengajaran

PSS008 - DARI PENTAS KE PODCAST: THEATRE THAT ECHOES

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ABSTRACT

This project is an innovation by Kelab ABSTRAK, a theatre, dance, and music club in UiTM Kuala Pilah and its podcast initiative titled *Dari Pentas ke Podcast*, which transforms its stage productions into audio dramas. Theatre has long depended on the physical presence of both performers and audience, relying heavily on visual storytelling like sets, costumes and lighting. However, with the rise of digital platforms and changing audience behaviours, new formats are emerging to complement or even replace traditional performances. Audio drama, once associated with early radio, is now experiencing a resurgence through podcasts. This extended abstract introduces *Dari Pentas ke Podcast*, a student-driven innovation that reinterprets staged plays as audio productions to make theatre more accessible, sustainable, and creatively fluid.

Keywords – ABSTRAK, audio drama, podcast, Spotify, commercialisation

PST001 - GAMMAGLOW DUCK: READY-TO-COOK SMOKED DUCK MEAT PRESERVED VIA GAMMA TECHNOLOGY

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ABSTRACT

This innovation presents a ready-to-cook, vacuum-packed, gamma-irradiated smoked duck developed specifically for traditional Negeri Sembilan cuisine. It addresses key challenges faced by Malaysia's food processing micro, small, and medium enterprises (MSMEs), including short shelf life, microbial contamination, and quality degradation during storage. The objective is to produce a smoked duck product that retains its flavour and quality at ambient room temperature (27°C), eliminating the need for cold storage. This is achieved through the integration of three techniques: warm smoking, double-layer vacuum packaging, and gamma irradiation. Warm smoking reduces carcinogenic compounds typically associated with traditional smoking methods. The double-layer vacuum packaging enhances packaging durability and inhibits microbial growth. Gamma irradiation effectively eliminates microbial contaminants, extending shelf life while preserving the product's authentic taste and texture. This innovation offers a practical, scalable solution tailored for MSMEs in the poultry processing sector.

Keywords – Gamma Irradiation, Smoked Duck, Vacuum Packaging, Shelf Life Extension

PST002 - THE FIREFIGHTER ROBOT WITH CAMERA-BASED DETECTION AND GPS NAVIGATION

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ABSTRACT

Firefighting is a high-risk job where firefighters are often exposed to dangerous conditions such as fire, smoke, toxic gases and unstable structures. This project introduces a Firefighter Robot equipped with a night vision camera, designed to reduce or eliminate the need for human presence in hazardous situations. The robot can be remotely controlled or operate autonomously to navigate through rough terrain, detect fire in low visibility environments and extinguish flames using a built in fire suppression system. It also includes GPS tracking for real-time location monitoring and live video streaming to support decision making from a safe distance. The integration of these technologies into one system allows the robot to perform critical firefighting tasks efficiently and safely. This innovation not only protects human lives but also enhances the speed and effectiveness of emergency responses in dangerous or hard to reach areas.

Keywords – firefighter, robot, camera, gps tracking, arduino

PST003 - XactMath: AN INNOVATIVE TEACHING TOOL TO SUPPORT FORMULA AND TOPIC SELECTION IN BUSINESS MATHEMATICS

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ABSTRACT

This study investigates the use of the XactMath application as a digital learning tool to support students in mastering the topics of Simple Interest and Promissory Notes in Business Mathematics. The application guides students through three steps: identifying keywords, matching them to formulas and selecting the appropriate formula for problem-solving. A descriptive analysis was conducted to measure student acceptance and interest in the app after usage. Findings from a sample of 50 students, consisting of 36 females (72%) and 14 males (28%) revealed a high level of acceptance (M = 4.46, SD = 0.54) and strong interest (M = 4.44, SD = 0.52) in using the app for learning. Students agreed that the app improved their understanding, memorization and application of concepts, even without lecturer guidance. These results suggest that XactMath is a promising instrument for improving mathematical learning engagement and self-directed learning in business-related topics.

Keywords – engagement, technology, self-directed learning, mathematical learning

PST004 - MAMMOAI: AUTOMATED MAMMOGRAPHIC BREAST CANCER CLASSIFIER POWERED BY AUTOML

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ABSTRACT

MammoAI is a breakthrough AI-powered system designed to revolutionize breast cancer screening through fully automated mammographic image analysis. Developed using the state-of-the-art Auto-Sklearn AutoML framework, MammoAI integrates advanced image enhancement, tumor segmentation, and optimized machine learning pipelines to classify breast tumors with high precision. This product addresses the critical need for consistent, scalable, and accurate diagnostic tools, particularly in regions with limited radiological expertise. The innovation combines Contrast Limited Adaptive Histogram Equalization (CLAHE) and Active Contour Method (ACM) for robust tumor delineation, followed by extraction of 37 key radiomic features. These are then processed through MammoAI's smart ensemble learning engine, achieving 76.16% test accuracy and 0.86 AUC after optimization. Designed with scalability, speed, and minimal user input in mind, MammoAI holds strong commercialization potential as a clinical decision support system that augments radiologist workflow, reduces diagnostic delays, and enhances early detection outcomes.

Keywords – Mammography, Breast Cancer, Radiomics, AutoML, Auto-Sklearn

PST005 - EMPOWERING SUSTAINABLE INFRASTRUCTURE WITH SCDesignPro: AN INNOVATIVE EVALUATION OF STONE COLUMN PERFORMANCE

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ABSTRACT

Stone columns are widely used as a ground improvement technique to enhance bearing capacity and reduce settlement in soft soils. However, most conventional design approaches assume only vertical and concentric loadings, which may not reflect actual field conditions where complex load combinations often occur. SCDesignPro is an innovative solution developed to evaluate the bearing capacity of stone columns under inclined and eccentric loading conditions, addressing a critical gap in current geotechnical engineering practices. The tool integrates advanced numerical modelling using PLAXIS 3D with comprehensive parametric studies to develop practical and reliable design formulas. The novelty of SCDesignPro lies in its ability to account for combined inclined and eccentric loading effects, significantly enhancing design reliability for structures constructed on soft and challenging ground conditions. This contributes to safer and more efficient foundation performance, reducing the risk of failure. With its user-friendly interface and smart computational features, SCDesignPro offers an efficient and accessible design tool for engineers, consultants, and researchers. Its wide applicability and strong commercial potential position it as a valuable contribution to digital geotechnical engineering solutions. SCDesignPro aligns with SDG 9: Industry, Innovation and Infrastructure, by promoting resilient infrastructure through smart, data-driven design tools, and SDG 11: Sustainable Cities and Communities, by enhancing the safety and durability of urban development through improved ground improvement strategies.

Keywords – Stone Column, Bearing Capacity, Inclined Load, Eccentric Load, Sustainable

PST006 - Z-FERT: NATURAL FERTILITY FOR BETTER PLANT GROWTH

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ABSTRACT

Global agriculture faces critical challenges as soil fertility declines due to intensive farming practices and excessive chemical fertilizer use, with approximately 33% of soils worldwide being moderately to highly degraded. This study introduces Z-FERT, an innovative biological approach that utilizes *Zophobas atratus* larvae to transform horse dung into an effective organic fertilizer for enhanced plant growth. The research employed a Randomized Complete Block Design with seven replicates per treatment, conducted over six weeks using *Spinacia oleracea* (spinach) as the model plant species. The experimental framework incorporated *Z. atratus* larvae (1.5-2.5 inches) to accelerate the decomposition of sterilized horse dung (100g per sample), creating a nutrient-rich organic fertilizer. Soil organic matter content, plant height, dry biomass, and relative growth rate were measured using Loss on Ignition method and statistical analysis through two-way ANOVA and paired t-tests. Results demonstrated that horse dung-treated soil showed significantly higher organic matter content (2.588 ± 0.13%) compared to control groups. Plants grown in horse dung-treated soil exhibited significantly greater height increases ($p = 0.001$), with growth rates of 19.05% versus 14.29% in control conditions. The relative growth rate was also significantly higher (0.025±0.004 g/day) compared to control soil (0.012±0.0026 g/day). This innovative approach represents a breakthrough in sustainable agriculture by providing a scientifically rigorous, economically viable solution to soil degradation. Z-FERT harnesses natural decomposition processes to create a scalable alternative to chemical fertilizers while reducing organic waste pollution and CO_2 emissions, ultimately supporting next-generation farming practices that balance high productivity with environmental stewardship.

Keywords – organic fertilizer, plant growth, soil fertility, sustainable agriculture, Zophobas atratus

PST007 - *LUBRIGREEN*: ECO-FRIENDLY BIOLUBRICANT BASE STOCK FROM SOYBEAN OIL

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ABSTRACT

The rising demand for lubricants in automotive and industrial sectors highlights the need for efficient, high-performance products with minimal environmental impact. Conventional lubricants, primarily derived from petroleum-based mineral oils, are non-renewable, environmentally hazardous, and contribute significantly to pollution and greenhouse gas emissions. These issues underscore the urgent need for sustainable alternatives. This innovation introduces *LubriGreen*, a novel biolubricant base stock synthesized from soybean oil, an abundant and eco-friendly raw material. *LubriGreen* is produced through a two-step process: hydrolysis of soybean oil to obtain soybean oil fatty acids, followed by esterification with neopentyl glycol, resulting in soybean oil neopentyl glycol (SBONPG) ester. This chemical modification improves the lubricant's thermal and oxidative stability, extending its service life and efficiency under demanding conditions. *LubriGreen* is biodegradable, non-toxic, and significantly reduces environmental risks by minimizing soil and water contamination. Its adoption supports green chemistry principles and contributes to the circular economy by adding value to agricultural products. Furthermore, it delivers excellent lubrication properties, reducing friction and wear in machinery and engines, thereby improving operational reliability and energy efficiency. By replacing petroleum-based lubricants with this renewable alternative, industries can achieve high performance while promoting environmental sustainability and economic resilience.

Keywords – biolubricant, environmental sustainability, renewable sources, soybean oil

PST008 - MORILIEF: SUGAR-FREE *MORINGA OLEIFERA* HERBAL LOZENGES FOR NATURAL THROAT CARE

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ABSTRACT

Sore throat, a common clinical complaint affects millions globally and often requires only symptomatic relief. In response to the increasing demand for natural and sugar-free solutions, we present 'Morilief' as an innovative, sugar-free hard candy lozenge formulated with *Moringa oleifera* extract. Known for its anti-inflammatory and antimicrobial properties, *Moringa oleifera* was selected as the main bioactive component for its ability to relieve throat discomfort while promoting oral health. The formulation utilizes both hot and cold maceration techniques to extract bioactive compounds, combined with heat-controlled cooking and congealing processes to preserve their efficacy. To ensure suitability for diabetics and oral health-conscious users, the product incorporates natural sweeteners including xylitol, isomalt, and stevia. Acacia gum enhances the lozenge's structure and texture, while green tea emulco and natural colorants provide flavor and aesthetic appeal. Accelerated stability testing confirmed a projected 12-month shelf life with stable physical and microbial properties. Morilief represents a safe, effective, and consumer-friendly alternative to conventional throat lozenges, integrating herbal wisdom with modern sugar-free formulation technology. It addresses current health needs with promising commercialization potential.

Keywords – Moringa oleifera, sugar-free, lozenges, sore throat, herbal innovation

PST009 - ECOFUSION: SUSTAINABLE COMPOSITES FROM RECYCLED PLASTICS AND WATER HYACINTH FIBRES

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ABSTRACT

Ecofusion introduces an innovative, scalable solution to two pressing environmental challenges: plastic pollution and invasive water hyacinth (WH) overgrowth. Sustainable and good performance composites was fabricated by reinforcing recycled low-density polyethylene and recycled linear low density polyethylene (rLDPE/rLLDPE) with treated water hyacinth fibres (WHF). This project's core innovation is its pioneering dual-waste valorization approach, directly addressing ecological concerns while simultaneously creating a new class of functional composite materials; turning waste into wealth. WHF was chemically treated using 5 wt% NaOH to optimize interfacial bonding, and was further blended with rLDPE/rLLDPE at 5%, 10%, and 15% loadings. Rigorous testing revealed an increased in tensile strength peaking at 18.02 MPa with 10% WHF and a maximum Young's modulus of 352 MPa at 15% WHF, signifying enhanced stiffness. The increased in WHF loadings had also increased the impact strength, density and hardness of the composites. Fourier Transform Infrared (FTIR) analysis confirmed robust chemical interactions, ensuring material integrity despite WHF's inherent hydrophilicity. These cost-effective and scalable biocomposites demonstrate versatile applicability in areas such as eco-friendly packaging, lightweight automotive panels, and durable construction materials. Ecofusion represents a significant leap towards circular economy practices, offering a pragmatic and profitable pathway to mitigate plastic waste and manage aquatic biomass, delivering both ecological restoration and industrial advancement. This is a game-changer for sustainable materials.

Keywords – Sustainable composites, water hyacinth fiber, recycled polyethylene, green materials

PST010 - KIK SmartJury: AN AUTOMATED REAL-TIME SCORING SYSTEM FOR KIK CONVENTION JUDGING

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ABSTRACT

The evaluation process in innovation competitions, such as the Konvensyen Kumpulan Inovatif & Kreatif (KIK), traditionally involves manual score tabulation, ranking, and reporting. These manual processes can be time-consuming, prone to human error, and inefficient, especially in large-scale events. KIK SmartJury is a web-based automated scoring system developed to address these challenges for the UiTM Zon Selatan KIK Convention 2024. The system enables judges to input scores online, with dynamic, real-time calculation of results and automatic assignment of winners in each category and for the overall competition. Developed using Python (Flask) as the backend framework, HTML, CSS, and JavaScripted for the frontend and utilizing MySQL for database management, KIK SmartJury streamlines the judging process, generates comprehensive scoring reports, and enables direct export to PDF or Excel. By implementing the System Development Life Cycle (SDLC) methodology, the system was designed with iterative feedback and refinement, ensuring reliability and usability. KIK SmartJury represents a novel solution within UiTM, as no other branch has implemented a similar automated judging system for KIK events. This innovation has the potential for adoption across other UiTM branches and commercialisation for broader applications.

Keywords – automated scoring system, real-time calculation, system development, innovation competition

PST011 - ALGALEAN MEAT (LOW-FAT MEAT ANALOGUE WITH BORNEO SEA GRAPES)

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ABSTRACT

AlgaLean Meat is a plant-based meat analogue developed to meet the increasing global demand for healthy and sustainable protein alternatives. Conventional meat production is associated with high greenhouse gas emissions and intensive resource use, while many existing meat analogues rely heavily on synthetic additives, offering limited functional benefits. To address these gaps, AlgaLean Meat incorporates *Caulerpa lentillifera* (sea grapes), a nutrient-rich green seaweed native to Sabah, into textured vegetable protein-based formulations. The novelty of AlgaLean Meat lies in its integration of *C. lentillifera* into a meat analogue matrix, a combination rarely explored in commercial or research settings. The sea grapes are naturally rich in dietary fibre, bioactive compounds, as well as hydrocolloids that enhance water retention and cooking yield. By leveraging these properties, the product achieves functional improvements without artificial binders or preservatives. At an optimal inclusion level, seaweed enhances nutritional value and oxidative stability while maintaining desirable sensory qualities such as flavour, juiciness, and texture. The usefulness of AlgaLean Meat extends beyond its nutritional and sensory benefits. It offers consumers a healthier, lower-fat protein source with added dietary fibre, while its natural antioxidant capacity may extend shelf life. The product also showcases the potential of underutilized marine resources in the creation of value-added foods, aligning with sustainable development goals and market trends toward functional, eco-conscious eating. By combining Borneo's premium sea grapes with plant-based technology, AlgaLean Meat delivers an innovative, functional, and sustainable solution for the next generation of meat alternatives.

Keywords – plant-based meat, sustainable protein, functional food, seaweed

PST012 - A PRACTICAL EXCEL SOLUTION FOR MULTI-CRITERIA ANALYSIS USING THE ENTROPY-ARAS APPROACH

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ABSTRACT

In this project, the Entropy-Additive Ratio Assessment (Entropy-ARAS) method is integrated with a user-friendly Microsoft Excel template. Traditionally, the decision maker chooses the best option or the best alternative independently of mathematical analysis. The project used the Entropy-ARAS to resolve the complex multi-criteria decision-making (MCDM) problems. The ARAS method is used to select the best alternative, and the Entropy method is used to establish the weights of the criteria. On the other hand, the Microsoft Excel template is designed to facilitate the complex MCDM problems by offering an organized and transparent framework for assessing the alternatives according to the multiple conflicting criteria. The novelty of this innovation lies in the incorporation of the Entropy-ARAS method into a Microsoft Excel template. Users can make an efficient and transparent decision without programming knowledge. The implementation of this template will guarantee the consistency of the final decisions and minimize the computation errors. In addition, the Excel-based Entropy-ARAS tool helps users comprehend and apply MCDM techniques to real-world problems as well as improve the quality and speed of decision-making.

Keywords – Entropy, ARAS, decision making

PST013 - A USER-FRIENDLY EXCEL TEMPLATE FOR MULTI-CRITERIA DECISION MAKING (MCDM) PROBLEMS USING THE ENTROPY-COPRAS METHOD

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ABSTRACT

Multi-criteria decision-making (MCDM) problems are about choosing the best alternative while considering multiple conflicting criteria. Various MCDM techniques can be implemented to solve the MCDM problems. In this project, Entropy-COPRAS is implemented to solve the problem. The Entropy method is used to compute the weights of the criteria, while the COPRAS method is used to choose the best alternative. Traditionally, the decisions are made based on the decision-makers' subjective preferences and past experiences, which will lead to bias in the process. However, with the help of a mathematical analysis, the bias may be reduced significantly, since the Entropy calculates the weights of the criteria objectively. The Entropy-COPRAS integrates into a Microsoft Excel-based template to help decision-makers make transparent and organized decisions. The template will also allow decision-makers without programming knowledge to apply the Entropy-COPRAS method effectively. As a result, decision-makers can make decisions more quickly and with guaranteed calculation transparency.

Keywords – Entropy, COPRAS, selection problem

PST014 - A FRAMEWORK OF NATIONAL MONITORING AND REPORTING SYSTEM TO PREVENT UNAUTHORIZED RON95 PURCHASES

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ABSTRACT

The Malaysian government allocates significant subsidies to maintain the affordability of RON95 fuel for its citizens. However, increasing incidents of foreign-registered vehicles purchasing RON95 have raised concerns regarding subsidy leakage and policy inefficiency. The absence of real-time monitoring and public reporting mechanisms further hampers efforts to control these violations. This innovation outlines the framework of the development and implementation of a community-based digital monitoring system, *RON95 Watch*, which empowers citizens to report violations in real-time. The framework is used to propose a mobile platform for monitoring and reporting unauthorized purchases of RON95 by foreigners. This system is hoped to enhance transparency and accountability in the distribution of fuel subsidies. The system will utilize a mobile application, artificial intelligence (AI)-powered license plate recognition, and direct integration with enforcement agencies to ensure timely intervention. The implementation will be divided into three phases: the development and pilot testing, the nationwide rollout, and the integration and policy support. The novelty of the *RON95 Watch* lies in its integrated, citizen-centric approach to subsidy enforcement. The initiative aims to protect national interests, promote fairness, and enhance the effectiveness of fuel subsidy enforcement. Even though this is a framework of the real system, the idea of the monitoring system for the prevention of unauthorized RON95 purchases is a small step to a bigger implementation.

Keywords – RON95, artificial intelligent, RON95 Watch

PST015 - CHOCOSHIELD: PROBIOTIC CHOCOLATE FROM LOCAL LACTIC ACID BACTERIA AGAINST MULTIDRUG-RESISTANT FOODBORNE PATHOGENS

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ABSTRACT

This study investigated the antimicrobial potential of cell-free supernatants (CFS) from *Lacticaseibacillus paracasei* dan *Lactobacillus plantarum* K014 against key foodborne pathogens. *L. paracasei* was identified as the most promising strain isolated from 'musangking' durian, demonstrating strong bactericidal activity and targeted inhibition of selected pathogens. Synergistic testing with tetracycline revealed complex interactions, highlighting the importance of optimising combinations of natural and conventional antimicrobials. The novelty of this work lies in the strain-specific antimicrobial potential of locally isolated lactic acid bacteria, which supports their application as natural biopreservatives. The findings further provide a scientific basis for developing functional food products, such as probiotic chocolate bars, that deliver both health benefits and extended shelf life.

Keywords – bacteriocin, antibiotic-resistant foodborne pathogen, mechanism, lactic acid bacteria, functional food products

PST016 - FAST, GREEN & CLEAN: 5-MINUTE DYE REMOVAL USING CHICKEN FEATHER ACTIVATED CARBON

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ABSTRACT

Water pollution from synthetic dyes such as methylene blue (MB) is a pressing environmental challenge, particularly in textile and related industries. Conventional treatment methods often require long contact times, high chemical usage, and generate secondary waste. In this innovation, we present an eco-friendly, cost-effective, and ultra-fast adsorbent derived from chicken feathers, an abundant agricultural by-product typically discarded as waste. Through a controlled activation process, chicken feathers are transformed into high-surface-area activated carbon (CFAC) with enhanced adsorption capacity. The novelty of this product lies in its ability to achieve 98–100% MB removal within just 5 minutes using only 0.1 g of CFAC in a 5 ppm dye solution. This rapid performance surpasses many commercial activated carbons, offering significant advantages in energy and time efficiency. Furthermore, the use of chicken feathers as the raw material addresses two sustainability goals simultaneously: Clean Water and Sanitation (SDG 6) and Responsible Consumption and Production (SDG 12). The usefulness of this innovation extends to various industrial applications, including textile wastewater treatment, laboratory-scale dye removal, and as a rapid-response solution for accidental dye spills. Its low production cost, minimal dosage requirement, and biodegradability make it suitable for adoption in both developed and developing regions. This innovation demonstrates that waste can be transformed into a powerful environmental solution, proving that clean water can be achieved fast, green, and clean.

Keywords – chicken feather activated carbon, methylene blue, agricultural by product

PST017 - MEDIRANK: A LIGHTWEIGHT, WEB-BASED PRE-SCREENING TOOL USING EUCLIDEAN DISTANCE SIMILARITY

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ABSTRACT

MediRank is a web-based pre-screening diagnosis support tool designed to assist healthcare providers in rapidly identifying probable diseases based on patient symptoms and basic clinical parameters. Targeted for use in primary care and rural settings, where laboratory resources and specialist access may be limited, MediRank enables early case prioritisation and informed referral decisions. The system applies Euclidean Distance-based similarity analysis to compare a patient's symptom profile — including temperature, platelet count, white blood cell count, and selected clinical indicators — against a database of confirmed cases. The algorithm calculates the degree of similarity for each disease in the dataset, generating a ranked list of possible conditions from most to least likely. This process allows healthcare workers to quickly narrow down differential diagnoses before proceeding with confirmatory tests. MediRank's novelty lies in its lightweight, explainable, and real-time analysis framework. Built with Python and deployed using Streamlit, the tool runs directly in a web browser without installation, requires minimal computational resources, and produces transparent outputs that include similarity scores, ranked diagnoses, and visual comparisons. The integrated PDF export function enables instant documentation for patient records or referral purposes. As a pre-screening tool, MediRank is not intended to replace medical judgment but to support early triaging, improve diagnostic efficiency, and provide educational value for medical students learning about case similarity analysis. Its dataset-agnostic design allows adaptation to multiple medical domains, and future developments will explore weighted similarity measures, hybrid algorithms, and integration with electronic health record (EHR) systems.

Keywords – Euclidean distance, diagnosis support, similarity analysis, healthcare AI, medical ranking

PST018 - ELECTRO LAND: REDOX REACTIONS LEARNING DIGITAL ESCAPE GAME

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ABSTRACT

Many students struggle with mastering the redox reaction topic due to their multi-step processes, including oxidation-reduction concepts, electron transfer, and the balancing of redox equations. To address this issue, an interactive escape game entitled Electro Land was developed using the Genially platform. Unlike traditional learning and teaching methods, this game combines gamification with curriculum-based redox chemistry content and it was designed based on the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) instructional design model to ensure a structured and effective learning experience. The game embeds redox chemistry content where students must answer questions correctly to progress and ultimately “escape” the challenge. This gamified approach aims to enhance conceptual understanding and student engagement on the redox topic. Positive feedback from students suggests increased motivation, deeper comprehension, and overall satisfaction with the learning experience. The success of Electro Land indicates that similar gamification strategies can be effectively applied to other chemistry topics to foster an engaging and interactive educational environment.

Keywords – redox reaction, ADDIE, escape game, gamification

PST019 - SERENITYSENIOR:AN ELDERLY CENTERED DIGITAL MENTAL HEALTH PLATFORM

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ABSTRACT

This study introduces SerenitySenior, a mobile app that fulfills older persons' mental health needs. Accessible and personalized mental health support tools for older adults are needed due to the global demographic change toward an aging population. SerenitySenior is a user-friendly, culturally sensitive digital resource to improve seniors' mental health. Following a comprehensive literature analysis and digital health intervention best practices for older individuals, the study created a high-fidelity SerenitySenior prototype. Users with varying technological skills and physical constraints are accommodated by user-centric features like large, clear text, fast navigation, voice-activated instructions, and intuitive interaction techniques. Data collection has not yet occurred, but the app's features were built after a comprehensive examination of mental health solution studies to ensure relevance and accessibility. Guided meditation, mood-tracking tools, cognitive exercises, and educational materials on common mental health difficulties among older persons are available from SerenitySenior. Improve offline capabilities and add culturally varied material to better tailor the app to user needs. The study prioritized design concepts based on older folks' needs to make digital health interventions accessible and usable. This study shows that a user-centered, evidence-based approach can promote engagement and mental well-being in older adults using digital mental health care. Age-appropriate technology can help older populations with mental health difficulties, as SerenitySenior may be a valuable and accessible resource

Keywords – Mental health, Elderly people, user centered design, mobile app

PST021 - COCO-FIT: FUNCTIONAL FAT FROM BAMBANGAN KERNET FAT STEARIN AS COCOA BUTTER IMPROVER FOR TROPICAL APPLICATIONS

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ABSTRACT

This project produced a cocoa butter improver (CBI) by fractionating pure bambangan seed fat and blending it with cocoa butter to assess its impact on cocoa butter properties. Various attributes, including physicochemical properties, fatty acid composition, solid fat content, and compatibility of the produced stearin with cocoa butter, were evaluated through analytical analysis, gas chromatography, and pulsed nuclear magnetic resonance. Twelve physical blends were prepared from the pure bambangan seed fat and the stearin with cocoa butter, with the proportion of cocoa butter increased by 20 %. Among these blends, COCO-FIT (bambangan stearin) improved the thermal properties of cocoa butter at a blending ratio of 20% COCO-FIT and 80% cocoa butter. No significant changes were observed in the physicochemical properties of cocoa butter, indicating that the fat is compatible with cocoa butter. The solid fat content shifted towards higher temperatures, with COCO-FIT improving the gradual decrease in solid fat content of cocoa butter towards 30 °C to 35 °C. These blends melted at body temperature, reached 0 % SFC at 40 °C, and showed ideal compatibility without eutectic effects. Therefore, COCO-FIT presents as a novel cocoa butter improver to improve the hardness and melting properties of chocolate in tropical climates.

Keywords – cocoa butter improver, bambangan kernel fat, tropical chocolate, physicochemical properties

PST022 - RINDCHI : A ZERO-WASTE, FERMENTED DELICACY FROM WATERMELON RIND

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ABSTRACT

The white inner rind of the watermelon, an edible, nutrient-rich part that is usually discarded during fruit processing, is used to make RindChi, a novel, sustainable, plant-based kimchi that transforms food waste into a tasty, valuable fermented treat. RindChi, combines traditional kimchi-making methods with zero-waste innovation, offering a natural, flavourful and crunchy profile with no artificial additives. Natural lactic acid fermentation promotes gut health by utilising beneficial bacteria. The unique feature of this product is that it transforms an underutilised, locally available raw material into a functional food that supports resource efficiency, promotes environmental sustainability, and preserves cultural culinary traditions. This product is the preferred choice for environmentally conscious consumers looking for plant-based, health-conscious products. The product offers strong commercial potential by creating new revenue streams for micro-entrepreneurs, farmers, and food producers through upcycling initiatives. RindChi offers a scalable model for sustainable food innovation by combining strong flavour, nutritional benefits and an obvious environmental impact, focusing on creating products from waste and transforming them into a successful, profitable, and marketable product.

Keywords – watermelon rind, kimchi, food innovation, alternative ingredient

PST023 - AI-POWERED MOBILE APPLICATION PROTOTYPE FOR *SURAH AL-MULK* MEMORISATION

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ABSTRACT

This study presents an AI-powered mobile application prototype for *Surah Al-Mulk* memorisation. The application applies a *one day, one verse* approach for beginners, which integrates the memorisation technique such as chunking, *Tasalsuli* and *Tasmi'* with Automatic Speech Recognition (ASR). The VARK model is embedded to create a multi-sensory and step-by-step learning experience that is suitable for beginners. Expert evaluation using the Fuzzy Delphi Method showed strong consensus confirming that the prototype is relevant for Quran memorisation education. Performance testing of the ASR module produced an average Character Error Rate (CER) of 13.69% and Word Error Rate (WER) of 13.13%, indicating moderate recognition accuracy. The novelty of this product lies in its integration of Qur'an memorisation techniques with AI-driven speech recognition and multi-sensory engagement strategies. The prototype provides an accessible and interactive platform that is suitable for beginners. It is also able to bridge the traditional pedagogy with modern technological innovation in Quran education.

Keywords – AI-Powered Mobile Application, Speech Recognition, Quran Memorisation

PST024 - ULTRASONIC POWERFLOW: A CAVITATION-DRIVEN FLOW SYSTEM FOR CELL DISRUPTION

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ABSTRACT

Ultrasound disinfection represents a significant technological advancement with potential applications across multiple domains, such as water and wastewater treatment, food processing, and industrial settings. Practically, the ultrasonic treatment was performed to minimize negative environmental impacts by producing zero by-products without the addition of any additives. Thus, this study aims to explore safer and more efficient disinfection methods that address this issue, focusing on the use of Ultrasonic PowerFlow cavitation-driven. The advanced system utilizes frequency ultrasound waves to generate microbubbles that collapse under pressure, producing high shear forces that effectively inactivate pathogenic cells. Flow cell ultrasound was fabricated as a continuous flow process and adjusted to a loop reactor operating at 30 kHz, with a variation of power increments to the system (14, 35, 50, 64 and 92 %). The evaluation performance of flow cell ultrasound based on the disruption of *Escherichia coli* wild-type cells as a model organism and kinetic disinfection analysis. By identifying optimal conditions: 60 minutes of sonication, 35% power increments, Inoculum 10^8 Colony Forming Unit (CFU)/ml and a flow rate of 55 ml/min. The present investigation adhered to a first-order kinetics model and achieved a higher inactivation rate constant of 0.0286 min^{-1} (R^2 = 0.992) for the cells as a function of time in the kinetic process. This study demonstrates that the flow cell ultrasonic reactor is a highly effective and energy-efficient method for disinfection, offering a green alternative to traditional chemical methods. Indeed, the present findings support the goals of the Green Technology Master Plan Malaysia 2017–2030 by promoting sustainable and environmentally friendly solutions in the water and wastewater technology sectors.

Keywords – Flow cell ultrasound, bacterial disruption, disinfection process, kinetic disinfection, ultrasound treatment

RSSS001 - THE EFFECTIVENESS OF HAND FOLD PACK IN PACKAGING DESIGN

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ABSTRACT

This study explores the effectiveness of the Hand Fold Pack as an assessment tool to enhance technical skills, creativity, and conceptual understanding among Diploma in Print Media Technology students at Politeknik Muadzam Shah, within the framework of Technical and Vocational Education and Training (TVET). The Hand Fold Pack was developed as a low-cost, multifunctional product that incorporates elements of design, assembly, and print finishing processes. Its uniqueness lies in providing students with a tactile, practice-based learning experience that complements digital approaches. By experimenting with folding techniques, layout arrangements, and visual design principles, students were able to strengthen both fine motor skills and creative problem-solving abilities competencies highly valued in the printing industry. The tool integrates manual skill acquisition with critical design thinking, effectively bridging the gap between practical execution and conceptual understanding. Findings from the implementation with diploma-level students revealed significant improvements in their ability to visualize, design, and produce functional printed materials. Students also reported higher levels of engagement, creativity, and confidence, noting that the hands-on approach deepened their understanding of layout, spatial organization, and product structuring. Overall, the Hand Fold Pack demonstrates strong potential as an innovative assessment tool in TVET, supporting industry-relevant skill development and preparing students for future professional practice.

Keywords – hand fold pack, printing technology, technical skills, creativity

RSSS002 - ENHANCING CROSS-CULTURAL LEADERSHIP COMPETENCIES THROUGH EXPERIENTIAL LEARNING: A STUDY OF INDERALOKA INTERNATIONAL FESTIVAL

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ABSTRACT

As global societies become increasingly interconnected, effective leadership requires not only decision-making skills but also cultural sensitivity, adaptability, and inclusive collaboration. This study examines the impact of experiential learning on cross-cultural leadership competencies through the Inderaloka International Festival. A total of 458 students from Malaysia, Indonesia, and Japan participated in a pre- and post-festival assessment measuring self-perceived attributes including communication, teamwork, adaptability, and cultural awareness. Quantitative data were analyzed using SPSS, with results indicating statistically significant improvements across all domains. Regression analysis further demonstrated that pre-festival confidence was a strong predictor of post-festival leadership development. Complementing these findings, qualitative reflections underscored the importance of real-time multicultural collaboration in shaping leadership outcomes. Overall, the study affirms the transformative potential of experiential learning in cultivating cross-cultural leadership competencies essential for the next generation of global leaders.

Keywords – Cross-Cultural Leadership, Experiential Learning, Inderaloka

RSSS003 – STUDENT AND SUBJECT TEACHER ATTITUDE FACTORS CONTRIBUTING TO TRUANCY AMONG STUDENTS: A CASE STUDY

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ABSTRACT

School truancy is one of the issues currently being discussed within society. This study is a case study conducted at a daily secondary school in the Kuala Muda District, Sungai Petani, Kedah. It explores the influence of student's and subject teacher's attitudes as contributing factors to truancy at SMK Sungai Pasir Kechil, Sungai Petani, Kedah. The study involved 35 out of 100 Form Five students who were enrolled in the Economics subject for the year 2025. A quantitative research method was employed in this study. The data were analysed using descriptive statistics, specifically mean scores, with the assistance of E-Views software Version 20.00. The findings revealed that the overall mean score for student attitude factors was at a moderate level (mean = 3.58), while the mean score for teacher-related factors was high (mean = 4.25). Furthermore, the role of subject teachers in contributing to truancy also showed a high mean score of 3.73. Additionally, the findings indicated that teachers did not utilise teaching aids (ABM) and instructional materials (BBM) in line with 21st Century Education (PAK-21), with a high mean score of 4.45. This suggests that teacher-related factors significantly impact school truancy. In conclusion, both parents and teachers must work together to address and reduce truancy among students.

Keywords – Student attitude and teacher attitude, School truancy

RSSS004 - FUNCsiFlex: AN INNOVATIVE DIGITAL FRAMEWORK FOR ENHANCING FUNCTIONAL WORKFLOW EFFICIENCY IN HIGHER EDUCATION

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ABSTRACT

FUNCsiFlex, initiated by the Innovative and Creative Group (KIK) from Faculty of Administrative Science and Policy Studies (FSPPP), aims to revamp the Faculty's Quality Manual by introducing a digital and function-based structure. The manual had previously faced challenges such as outdated content, poor accessibility, and lack of clarity in procedures. Leveraging internal expertise, the new approach embeds a functional process flow that reflects real tasks across five core management areas. This innovation enhances documentation transparency, staff understanding, and procedural compliance. The initiative contributes to institutional governance excellence and boosts audit performance, with significant potential for replication and commercialization across faculties and other higher learning institutions.

Keywords – Quality Management System, Functional Documentation, Administrative Innovation

RSSS005 - THE INFLUENCE OF SOCIAL MEDIA ON BUILDING BRAND EQUITY AMONG SME IN MALAYSIA

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ABSTRACT

In the contemporary business landscape, social media has emerged as a pivotal driver of brand equity, particularly for Small and Medium Enterprises (SMEs) in Malaysia. This study investigates the influence of various aspects of social media usage - surveillance, social interaction, information sharing, remuneration, and entertainment content on brand equity, and examines the subsequent impact of brand equity on purchase intention. A quantitative, cross-sectional survey was conducted with 138 SME owners and managers across diverse industries in Malaysia. Data were analysed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess both measurement and structural models. The study addresses a critical research gap by integrating multiple dimensions of social media usage within a single framework and testing the mediating role of brand equity. The findings are expected to provide empirical evidence on how targeted social media strategies can strengthen brand equity and drive consumer purchase decisions. By bridging the gap between theory and practice, this research offers actionable insights for SME practitioners to optimise their digital marketing efforts and for policymakers to design supportive interventions that enhance SME competitiveness in the digital economy.

Keywords – Social Media Usage, Brand Equity, Purchase Intention, SMEs, Digital Marketing

RSSS006 - WISE MENTOR OF HISTORY

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ABSTRACT

This study was conducted to help students remember historical facts through the History Wise Mentor Technique. The technique was introduced as an alternative to attract students' interest in History, a subject often considered boring due to the need to memorize many facts. Using tools such as cards, short notes, question cards, and digital applications, historical information is transformed into simple notes and engaging visuals.
Findings show a significant improvement – from students answering only at least 4 out of 10 questions in the pre-test to 90% of students successfully answering well after applying this technique. It not only enhances memory of historical facts but can also be applied to other subjects. This technique serves as an effective teaching aid for both teachers and students, contributing to improved academic performance.

Keywords: History Wise Mentor Technique, history fact remembering method, student performance improvement

RSST001 - FACTORS AFFECTING RUBBER PRICES IN MALAYSIA

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ABSTRACT

Rubber prices in Malaysia fluctuate significantly due to a range of factors. This research investigates how both external market conditions and environmental variables influence these price changes. In particular, this study examines the impact of rubber exports, crude oil prices, exchange rates, temperature, and rubber planted area. Excel and Minitab were used to analysed secondary data collected from 1990 to 2022 using time series regression. The results indicate that crude oil prices and rubber exports significantly affect rubber prices, while temperature, exchange rates, and rubber planted area exhibit weaker impacts. These findings provide valuable insights into stabilizing rubber prices and enhancing economic resilience within Malaysia's rubber industry.

Keywords – Rubber prices, crude oil, exchange rates, rubber exports, rubber planted area, temperature

RSST002 - FORECASTING DAILY LRT AMPANG LINE RIDERSHIP USING SARIMA MODEL

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ABSTRACT

Accurate forecasting of public transport ridership is crucial for effective urban transit planning and operations. In particular, short-term prediction of LRT ridership in Kuala Lumpur plays a pivotal role in optimizing scheduling and resource allocation. The main objective of this study is to develop a reliable statistical model for forecasting the daily ridership of the LRT Ampang line. This study employs the Seasonal Autoregressive Integrated Moving Average (SARIMA) model based on Box-Jenkins methodology to analyze daily ridership data obtained from the Malaysia Official Open Data Portal. The dataset covers the period from January 2023 to May 2025. Model identification and estimation involved stationarity checks, ACF and PACF analysis, and parameter selection using AIC and BIC. The final model selected, SARIMA$(1,1,2)(0,1,1)_7$, demonstrated strong forecasting performance with a MAPE of 9.78%. Residual analysis confirmed model adequacy through the ACF plot of residuals and the Ljung-Box test. This study concludes that SARIMA is a robust and interpretable statistical method for forecasting daily LRT ridership. It offers a structured statistical approach that contributes to improved decision-making in public transportation planning through short-term ridership forecasting.

Keywords – LRT Ridership, Box-Jenkins, SARIMA, time series analysis

RSST003 - UNVEILING ANTIOXIDANT PROPERTIES OF*RHODOMYRTUS TOMENTOSA* (KEMUNTING): A COMPARISON BETWEEN ITS LEAF AND FRUIT

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ABSTRACT

Rhodomyrtus tomentosa (kemunting), a native plant of Southeast Asia, has long been used in traditional medicine and is now attracting attention for its antioxidant potential. This study compared the antioxidant properties of its leaves and fruits through the determination of total phenolic content (TPC), total flavonoid content (TFC), total anthocyanin content (TAC), and antioxidant activity using DPPH and FRAP assays. The leaf extract exhibited significantly higher TPC (115.90±1.72 mg GAE/g), DPPH activity (84.10±1.43%), and FRAP value (121.96±1.42 mg TE/g), indicating stronger antioxidant capacity. In contrast, the fruit extract showed higher TFC (316.52±6.79 mg QE/g) and TAC (86.11±4.40 mg/L), reflecting its richness in flavonoids and anthocyanins. These findings highlight the distinct antioxidant profiles of kemunting leaves and fruits and emphasize the potential of this underexplored native plant for functional applications in Malaysia.

Keywords –Rhodomyrtus tomentosa (Kemunting), Antioxidant activity, DPPH, FRAP, anthocyanin

RSST004 - DEVELOPMENT OF A MULTILINGUAL WEB-BASED EDUCATIONAL APPLICATION TO PROMOTE CULTURAL LITERACY THROUGH NASI DAGANG

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ABSTRACT

In an increasingly globalized education landscape, promoting cultural awareness through local culinary heritage offers an engaging pathway for cross-cultural learning. This paper presents the development of Nasi Dagang Explorer, a multilingual web-based educational application designed to introduce the traditional Malaysian dish, *Nasi Dagang*, to a diverse audience through interactive content. The innovation was inspired by the Festival Nasi Dagang event, which highlighted the lack of digital tools integrating cultural narratives with language education. The application consists of five modules: a multilingual introduction, ingredient glossary, bilingual cooking recipe, East Coast dialect phrases, and interactive games. It was developed using lightweight tools such as Streamlit, Canva Web, and JSON-based dictionaries, with audio integration and quizzes. The methodology included content curation, interface design, multilingual translation, and user testing with 30 international student participants. Results from pilot testing indicated that 90% of users agreed the application improved both cultural and language understanding. This study demonstrates the potential of food-based educational technologies to support inclusive, interactive, and culturally anchored learning experiences. It contributes to the fields of digital humanities, educational technology, and cultural studies by providing a replicable model for similar initiatives focused on traditional cuisines and languages.

Keywords – Multilingual Education, Cultural Heritage, Educational App, Nasi Dagang, Web-Based Learning

RSST005 - SUSTAINABLE TREATMENT OF AGRICULTURAL EFFLUENT USING SUGARCANE BAGASSE AND ALUMINIUM SULFATE

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ABSTRACT

Agricultural activities often lead to water pollution due to fertilizer use, which can cause eutrophication and harm ecosystems. This study aims to evaluate the effectiveness of sugarcane bagasse extract and aluminum sulfate as coagulants in treating agricultural effluent, focusing on turbidity, pH, and nitrate removal. A jar test experiment was conducted using various dosages to determine the optimum level for each coagulant. Sugarcane bagasse extract showed its best performance at 12 mg/L, removing about 42% turbidity, while aluminum sulfate achieved 100% turbidity removal at 48 mg/L. However, aluminum sulfate lowered the pH to 3.91, making it less suitable for irrigation. In contrast, sugarcane bagasse maintained a safer pH of 4.705. For nitrate removal, aluminum sulfate showed consistent and stable performance, while sugarcane bagasse results were more variable. Overall, aluminum sulfate is highly effective in removing turbidity and nitrate but may not be ideal for applications requiring a neutral pH. Sugarcane bagasse extract shows potential as a natural coagulant but requires pre-treatment to improve its performance.

Keywords – agricultural effluent, aluminium sulphate, coagulant, sugarcane bagasses

RSST006 - FUNCTIONAL GROUP ANALYSIS AND ADSORPTION EFFICIENCY OF UNTREATED AND TREATED SPENT COFFEE GROUNDS IN CRYSTAL VIOLET REMOVAL

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ABSTRACT

This study investigates the potential of untreated and thermally treated spent coffee grounds (SCG) as low-cost biosorbents for the removal of crystal violet (CV) dye from aqueous solutions. Structural characterization using Fourier-transform infrared spectroscopy (FTIR) revealed functional groups such as hydroxyl, carbonyl, and aromatic groups involved in the adsorption process. Batch adsorption experiments were conducted at various SCG dosages (2–20 g/L) to determine percent removal and adsorption capacity for both untreated and treated SCG. Findings showed that untreated SCG performed slightly better than treated SCG, achieving a maximum CV of 99.7% removal and 231.0 mg/g adsorption capacity, whereas treated SCG consistently showed around 92% removal and 230.7 mg/g adsorption capacity. FTIR analysis suggested that while thermal treatment intensified certain functional groups, it may also reduce porosity and active site accessibility, negatively impacting adsorption performance. These findings highlight the promise of SCG as an eco-friendly and cost-effective adsorbent for dye-contaminated wastewater treatment.

Keywords – Spent coffee grounds, crystal violet, adsorbent, wastewater treatment, functional group characterisation

RSST007 - DEVELOPMENT OF MUSHROOM PROTEIN HYDROLYSATE AS FLAVOUR ENHANCER: ITS PHYSICOCHEMICAL PROPERTIES AND SENSORY ACCEPTABILITY

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ABSTRACT

The increasing demand for natural and healthier flavour alternatives has spurred interest in mushroom protein hydrolysates (MPH) as potential substitutes for monosodium glutamate (MSG). This study developed MPH from *Agaricus bisporus* and *Pleurotus ostreatus* using bromelain enzyme and evaluated their physicochemical properties and flavour-enhancing potential. The hydrolysates were characterized based on degree of hydrolysis (DH), moisture, crude protein, ash, pH, colour analysis, amino acid composition using High-Performance Liquid Chromatography (HPLC) with a fluorescence detector together with amino acid column and identification of volatile compounds using gas chromatography-mass spectrometry (GCMS). Additionally, their sensory acceptability was evaluated by incorporating different concentrations (3% and 5%) of MPH into chicken soup formulations. A 9-point hedonic scale was used to assess consumer perception in terms of colour, aroma, umami, saltiness, aftertaste and overall acceptability. The results revealed that *A. bisporus* hydrolysate demonstrated a significantly higher degree of hydrolysis, crude protein, ash and total amino acids compared to *P. ostreatus*. Notably, *A. bisporus* contained higher levels of flavouractive amino acids such as glutamic acid and aspartic acid, indicating greater umami potential. However, sensory evaluation showed that MSG remained the most preferred. Among the mushroom hydrolysates, *P. ostreatus* at 3% concentration had the highest overall acceptability suggesting its suitability as a natural flavour enhancer in soup products. The novelty of this research lies in its comparative analysis of two mushroom species for hydrolysate development using enzymatic hydrolysis. Its significance is reflected in the potential application of MPH as a clean-label alternative to synthetic additives, contributing to healthier food innovation.

Keywords – mushroom protein hydrolysates, flavour enhancer, MSG, A. bisporus, P. ostreatus

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RSST008 - A REVIEW OF INNOVATIONS IN MOBILE AND REMOTE INSPECTION TECHNOLOGIES FOR THE CONSTRUCTION INDUSTRY (2020 TO 2025)

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ABSTRACT

This paper reviews recent innovations in mobile and remote inspection technologies applied to the construction industry from 2020 to 2025. Using a structured literature review of 673 peer-reviewed studies retrieved from Scopus, the study synthesises trends in Building Information Modelling (BIM), cloud-driven platforms, Internet of Things (IoT), unmanned aerial vehicles (UAVs), robotics, and artificial intelligence (AI) applications. Results indicate that digital and ICT frameworks dominate research output, followed by AI-based defect detection and innovations in construction materials. In contrast, UAV-enabled inspection and IoT integration remain underrepresented although they are highly relevant to safety and accessibility. The analysis highlights benefits such as reduced inspection time, improved accuracy, and enhanced stakeholder communication, while persistent barriers include cost, interoperability, and digital literacy challenges, especially for small and medium-sized enterprises (SMEs). The review identifies a research gap in integrating emerging tools such as digital twins, robotics, and renewable energy linked inspection frameworks. It concludes with recommendations for cost-effective deployment, targeted training, and regulatory support to strengthen the adoption of Construction 4.0 practices.

Keywords – Mobile inspection, remote inspection, construction technology, BIM integration, digital twin, SME adoption

RSST010 - COMPARATIVE ANALYSIS OF KETO BREAD FORMULATIONS: SENSORY, SHELF-LIFE, AND QUALITY ATTRIBUTES

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ABSTRACT

The rising popularity of ketogenic diets, particularly among individuals managing diabetes or pursuing weight loss, has driven demand for low-carbohydrate bread alternatives. However, substituting wheat flour with low-carbohydrate, high-fat flours can alter sensory qualities and affect consumer acceptance, and research on their quality and shelf-life remains limited. This study compared sensory, shelf-life, and quality attributes of keto bread made with almond, oat fiber, coconut and walnut flours, using standard wheat bread as a control. Shelf-life was assessed via microbial counts and pH over 12 days, while quality parameters included loaf volume, texture, moisture, and colour. Sensory evaluation using a 9-point hedonic scale involved 50 panellists. Almond flour bread showed the highest microbial stability, while oat fiber bread has the smallest pH variation and highest moisture content. Both almond and oat fiber breads had the highest absolute loaf volume, though wheat bread recorded the highest specific volume. Almond flour bread also had the softest, most springy crumb, whereas coconut flour bread achieved highest overall preference among keto variants. These findings provide a scientific basis for optimising keto bread formulations with improved sensory quality and stability.

Keywords – ketogenic diet, low-carbohydrate, high-fat, keto bread

RSST011 - ANALYSIS OF VEGETATIVE COMMUNITY STRUCTURE AND DIVERSITY OF UiTM KUALA PILAH FOREST

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ABSTRACT

Secondary tropical forests are critical for biodiversity conservation and ecological resilience in Malaysia, yet their structural complexity and recovery potential remain under documented. A lack of detailed data on community composition and forest dynamic limits effective monitoring and sustainable management. This study aims to evaluate the vegetative community structure and diversity of the UiTM Kuala Pilah Forest, a secondary lowland dipterocarp forest. Using stratified random sampling, a 50m x 10m plot was established and subdivided into five 10m x10m subplots. Vegetation data were collected for all trees with a diameter at breast height (DBH) ≥ 10cm. A total of 27 individual trees were recorded, representing 17 genera. Key structural parameters analysed, including genus frequency, basal area, size class distribution, Importance Value Index (IVI), and species diversity using Shannon-Weiner Index and Simpson's Index. Results show that *Shorea* sp. and *Dysoxylum* sp. are the most frequent genera (60%) and share the highest relative density (0.0080 indiv/m²). *Shorea* sp. recorded the highest IVI (44.40), suggesting ecological dominance, while *Cinnamomum* sp. exhibited structural dominance with the largest basal area (0.2068 m²). tree size class distribution showed dominance in the 10.0-14.9 cm class (n=12), forming a reverse-J curve indicative of active regeneration. The Shannon-Weiner Index value of H'= 2.80 reflects moderate to high diversity consistent with other secondary dipterocarp forests, while Simpson's Index (1-D= 0.894) shows high heterogeneity and low dominance among genera. These findings suggest that the UiTM Kuala Pilah Forest supports a structurally heterogeneous and ecologically functional community, highlighting its importance in biodiversity conservation and forest recovery assessment.

Keywords – Vegetative structure, species diversity, lowland dipterocarp forest, basal area, regeneration

RSST012 - COPROLOGICAL AND MOLECULAR INVESTIGATION OF ANIMAL PARASITE IN COW STOOL IN KUALA PILAH, NEGERI SEMBILAN

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ABSTRACT

Animal parasites is one of the significant threat to cattle productivity and public health due to their potential zoonotic risks. This study investigated the presence of *Toxocara* spp., *Cryptosporidium* spp., and *Fasciola* spp. in cattle from three farms in Kuala Pilah, Negeri Sembilan, using both coprological and molecular methods. A total of 30 faecal samples were examined through direct smear, formalin-ether sedimentation and trichrome staining for coprological analysis. Additionally, Polymerase Chain Reaction (PCR) amplification was performed using each parasite-specific primers to detect the DNA. Coprological results revealed *Toxocara* spp. (40%), *Cryptosporidium* spp. (33.33%), and unidentified animal parasites (13.33%), with no *Fasciola* spp. eggs observed. However, PCR did not yield amplification of all the targeted parasite DNA, which may have been due to low infection intensity, the presence of PCR inhibitors, or limitations in primer sensitivity. Interviews with farm managers revealed that deworming practices were inconsistent and management systems varied across farms, including both free grazing and confined feeding conditions, which may contribute to parasite transmission. These findings indicate a possible low prevalence or subclinical fascioliasis among cattle in the study area. To improve detection accuracy, future studies should incorporate validated primers, synthetic DNA as positive controls, and PCR additives. Regular deworming and improved farm hygiene practices are also recommended to manage parasitic risks more effectively.

Keywords – animal parasites, Toxocara spp., Cryptosporidium spp., Fasciola spp., ITS2 region

RSST013 - ADVANCING AI-READY TEACHER EDUCATION: INTEGRATION OF GENERATIVE AI

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ABSTRACT

The integration of Generative Artificial Intelligence (GenAI) into teacher education holds significant potential to enhance academic outcomes, foster engagement, and strengthen communication between educators and learners. This study examines the perceptions of trainee teachers on the integration of Generative AI at the Institute of Teacher Education, Technical Education Campus (IPGKPT). Anchored within global and national policy frameworks including the OECD Learning Compass 2030, UN Sustainable Development Goal 4, Malaysia's Digital Education Policy 2023–2030, and Malaysia TVET Policy 2030 as the research positions GenAI as a catalyst for educational transformation. Employing a descriptive quantitative design, data were collected from a stratified cohort of Bachelor of Teaching (PISMP) trainee teachers via a structured questionnaire adapted from validated instruments and demonstrating high reliability (Cronbach's $\alpha > 0.90$). Descriptive statistical analyses revealed strong positive perceptions of improvement and engagement ($M = 3.59$, $SD = 1.18$), barriers and challenges ($M = 3.37$, $SD = 1.03$) and communication and independence ($M = 3.12$, $SD = 1.02$). Nonetheless, notable concerns were identified, including ethical issues, fairness in assessment, infrastructural limitations, and the risk of diminishing the teacher's role. These findings highlight the need for targeted professional development, clear institutional guidelines, and equitable access to resources to ensure responsible GenAI integration. The study contributes empirical evidence to the growing discourse on AI readiness in teacher education, offering strategic recommendations aligned with Malaysia's national digital and TVET priorities.

Keywords – Generative AI, TVET, Trainee Teachers

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