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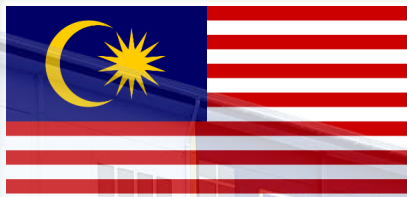
THE 4th INTERNATIONAL MALAYSIA-INDONESIA-THAILAND SYMPOSIUM ON INNOVATION AND CREATIVITY, 2021

**EXTENDED ABSTRACT
24 AUGUST 2021**

UNIVERSITI TEKNOLOGI MARA
PAHANG BRANCH, MALAYSIA

*'Embracing
Innovation & Creativity
in
Industrial Revolutions'*

e-Proceeding

The 4ᵗʰ International Malaysia-Indonesia-Thailand Symposium On Innovation and Creativity 2021
'Embracing Innovation & Creativity in Industrial Revolutions'

Universiti Teknologi MARA
Pahang Branch
26400 Bandar Tun Abdul Razak, Jengka
Pahang, Malaysia

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WELCOMING REMARKS

Assalamualaikum wbt and greetings to all IMIT SIC 2021 participants.

It is a great pleasure to welcome all of you to the 4th International Malaysia-Indonesia-Thailand Symposium on Innovation and Creativity (IMIT SIC 2021). IMIT SIC is an annual program organized in shifts by universities' collaborators, as well as their strategic partners from Indonesia, Malaysia and Thailand. IMIT SIC was successfully organized by UiTM Perlis Branch in 2017, Universitas Riau (UNRI) in 2018 and Princess of Naradhiwas University (PNU) in 2019. Despite the strike of Covid-19 pandemic which has affected our academic institutions, UiTM Pahang branch has endeavoured the challenge by organizing this event via the virtual platform.

2020 and 2021 have been extremely challenging years for all of us. We struggled to keep up with the new norm caused by the pandemic, where the populations of the world were shaken, and still are. Although it has been a tough year, we must continuously move forward and face the obstacles that bring us to the adaptation of new practices.

Based on this creative adaptation approach, the ultimate objective of this symposium is to gather all researchers, scientists, experts and scholars from the Social Sciences, Business Administration, Engineering, as well as the Science Technology communities particularly in the Southeast Asian countries. Besides, it is hoped to be a channel to emphasize and empower the culture of innovation, to prepare a platform for ideas, information, and expertise as well as to expose innovators to potential investors through international partnership opportunities.

My deepest congratulations to the organizer of this important event, especially the Chairman, Associate Professor Dr Wan Mohd Nazri Bin Wan Abdul Rahman and his committee members, who have performed incredible tasks in organizing this event. Besides, I would like to convey my appreciation to all the strategic partners who have given their endless support throughout the process.

I would also like to express my gratitude to all keynote speakers and participants from Malaysia, Indonesia and Thailand. With the theme "*Embracing Innovation & Creativity in Industrial Revolution*", IMIT SIC 2021 could advance the latest developments in social sciences, science and technology, engineering, technology, art and civilization for a better future.

I hope everyone gains advantage from the abundance of knowledge and networking opportunities offered by IMIT SIC 2021. Thank you for your efforts and contributions in making this event a success. All the best, and may you have a fruitful symposium.

Thank you.

Prof. Ts. Dr Mohd Ilham Bin Adenan
Rector
Universiti Teknologi MARA Pahang Branch

WELCOMING REMARKS

Praise and gratitude to Allah SWT for all his graces and blessings.

The 4th International Malaysia-Indonesia-Thailand Symposium on Innovation and Creativity (IMIT SIC 2021) will be held virtually on 24th August by Universiti Teknologi MARA Pahang Branch, Malaysia. This is the first time IMIT SIC is conducted virtually due to Covid-19 pandemic. Hence, it is such a great achievement to have 3 keynote speakers from our strategic partners, and more than 300 products, innovation, designs and idea contributions from all over Malaysia, Indonesia and Thailand.

With the theme "*Embracing Innovation & Creativity in Industrial Revolution*", IMIT SIC 2021 aims to bring together researchers, scientists, scholars, practitioners, and industrialists to share, expose, communicate and commercialize new innovations, inventions, products and ideas as well as research findings in the areas of social sciences, science and technology, engineering, technology, art and civilization to neighbouring countries and also to the international platform.

As the chairperson of 4th IMIT SIC 2021, I would like to express my heartfelt gratitude to the organizing committee members for their unwavering commitment to ensure the success of this symposium. I would also like to convey my sincere appreciation and congratulations to Universiti Teknologi MARA Perlis Branch, Universiti Teknologi Johor Branch, Universiti Teknologi MARA Sarawak Branch, Universitas Islam Riau, Princess of Naradhiwas University, Yala Rajabhat University, Universitas Tanjungpura, Universitas Airlangga and Phuket Rajabhat University as our strategic partners and The Malaysia Solid State Science and Technology Society for supporting this symposium.

This symposium would also not be possible without the generous assistance from the management of Universiti Teknologi MARA Pahang Branch, strategic partners, moderators, judges who have selflessly contributed to the event. I hope everyone will enjoy the content, develop new research linkages and generate more ideas through the symposium. Besides, I hope IMIT SIC will serve as a platform for researchers, scientists, industrialists and scholars in cultivating research, innovation and creativity.

Your participation today will surely strengthen and play the most meaningful role in generating, publishing, and sharing new ideas and knowledge, as well as realizing the theme of IMIT SIC 2021. I am looking at the bright future of IMIT SIC in the years to come, to deliver better than its preceding years. I hope through IMIT SIC, we can continue to synergize, spread the benefits, and gain valuable experience.

Thank you.

Assoc. Prof. Dr. Wan Mohd Nazri Bin Wan Abdul Rahman
Chairman IMITSIC 2021
Universiti Teknologi MARA Pahang Branc

MESSAGE FROM THE EDITOR

It is our pleasure to welcome you to the IMIT SIC 2021 extended abstract proceedings. The proceedings are collections of research reports contributed by researchers, academicians and students from Malaysia, Indonesia and Thailand.

My sincere gratitude goes to the authors, reviewers and technical program committee members for their contribution, hard work and support in promoting IMIT SIC 2021 in Malaysia, Indonesia and Thailand. More than 290 extended abstracts went through a peer review process and each was accepted based on its relevance, innovation and application to the respective field it represents.

The proceedings house a collection of extremely interesting and most current innovations, inventions and research findings, hence would be a valuable source of information and reference for researchers, academicians and students alike.

Thank you

Ruziana Mohamed
Chief Editor

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CARBON BASED NANOFLUIDS

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Keywords: Carbon nanoparticles, Nanofluids, Ultrasound method, Rheology, Longevity.

1. Introduction

Carbon nanofluids are waste to wealth projects. By converting the industrial waste into value-added advanced material, this green-based nanoparticle was mixed with the binary mixture to form carbon-based nanofluids. For this project, a quick study on the application specs using the carbon-based nanofluid as a nano coolant for automotive testing in the real engine, show that the carbon-based nanofluids possessed better properties compared to the commercially available coolant in terms of heating performance and longevity.

2. Methodology

Various concentrations of CNP ranging from 0 vol% - 0.10 vol% were dispersed in a binary mixture which is ethylene glycol and water assisted ultrasound for 60 min to produce nanofluids [1] . SEM, Rheology, UV-Vis and longevity study were performed to investigate the nanofluids properties.

3. Results & Discussion

4. Conclusion

Various concentrations of nanofluids were successfully prepared by using the ultrasonic method. The surface morphology of CNP ranges from 50nm – 100nm. Rheology study indicates that the shear stress improves linearly to the shear rate even with small concentration of CNP. The nanofluids appear to be stable from UV-Vis study. Longevity study proves that the carbon nanofluids have achieved the optimal working temperature within a short time and have the huge potential to be used in automotive application.

Acknowledgments

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Figure 1. (a) SEM image for CNP, (b) Flow curve graph of different CNP nanofluids concentration, (c) Stability study of CNP nanofluids (UV-Visible measurement), (d) Longevity study of temperature against time with different types of fluids.

SIL-PHATE: ANTIMICROBIAL & ALCOHOL-FREE HAND SANIIZER

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Keywords: Alcohol-free, Antimicrobial, Sanitizer, Silver phosphate, Safe.

1. Introduction

The current pandemic of COVID-19 has created a huge awareness on the use of hand sanitizers. Hand hygiene is critical as a preventive measure from the colonization of microbes and subsequently reducing the chances of getting infected, especially in the crowded areas. Now, there are several alcohol-based hand sanitizers in the market. However, repetitive usage of these alcohol-based hand sanitizers might trigger some health issues to those who have dermatological underlying conditions. They may experience skin dryness, itchiness and sometimes can lead to eczema. Thus, Sil-PhaTe, a formulation of hand sanitizer from Silver phosphate (Ag_3PO_4) was produced. Silver phosphate which is found to have an antimicrobial activity is formulated using natural aloe vera gel as its base. The combination provides an alternative to the users who have sensitive-skin. With the tagline of "Safe, User-Friendly, Effective", Sil-PhaTe is a promising product in combating the spread of microbial diseases.

2. Methodology

A specific concentration of Ag_3PO_4 particles (prepared by using precipitation method) with promising antimicrobial efficacy was incorporated into aloe vera gel base to develop a moisturising Sil-PhaTe hand sanitizer. Prior to the preparation of Sil-PhaTe hand sanitizer, Ag_3PO_4 particles were characterized using XRD and SEM; and their antimicrobial activity was investigated through disc diffusion method.

3. Results & Discussion

Figure 1(a) illustrates the XRD pattern of Ag_3PO_4 particles and SEM images exhibit large micro-sized spherical-like particles of Ag_3PO_4 (Figure 1 (b)) [1].
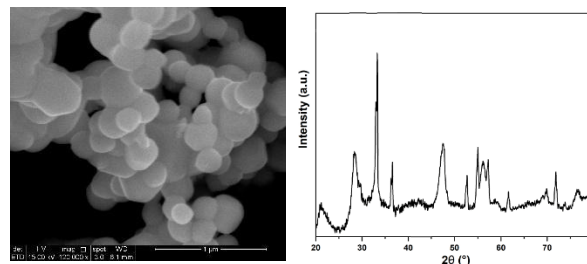
Figure 1. (a) SEM image and (b) XRD pattern of Ag_3PO_4 particles

4. Conclusion

With Ag_3PO^4 as its active antimicrobial ingredient, Sil-PhaTe is formulated to provide an alternative hand sanitizer to the respective consumers.

References

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ECO-ASPHALT: THE GREEN PAVING INNOVATION

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Keywords: Bio-asphalt, Morphology, Atomic force microscopy, Modified asphalt mixture.

1. Introduction

Eco-Asphalt is a new green paving material that has high potential to be implemented in the paving industry. Laboratory performance testings reveal that Eco-Asphalt performs better than conventional mixture over a wide range of temperatures. This innovation is in line with the Sustainable Development Goals and has commercial potential in the road industry.

2. Methodology

Eco-Asphalt was prepared by blending a 60/70 penetration grade bitumen with palm kernel oil polyol (PKO-p) and 2,4-diphenylmethane diisocyanate (MDI). Samples were blended at 110˚C with 2000 rpm for 15 minutes to form a homogeneous binder [1]. Next, the sample was mixed with the designed aggregate gradation to produce the Eco-Asphalt mixture.

3. Results & Discussion

Result shows that the inclusion of PKO-p and MDI has stiffened the bitumen as shown in Figure 1(a) which indicates an improvement in rutting resistance. Higher resilient modulus values were found for the Eco-Asphalt mixture as shown in Figure 1(b), indicating that this novel asphalt mixture can improve the fatigue and permanent deformation at both intermediate and high temperatures. Lower value obtained from the dynamic creep testing indicates that the Eco-Asphalt mixture also improves rutting resistance.
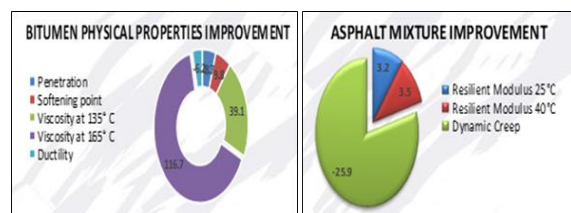
Figure 1(a). Bitumen properties improvement
Figure 1(b). Asphalt mixture improvement

4. Conclusion

Eco-Asphalt is a very promising material to support the development of a safe and green road.

Acknowledgments

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COCONUT WATER AS ADDITIONAL SUPPLEMENT IN ROOT FORMATION OF *C. nutans*

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Keywords: *C. nutans*, Benzyl-aminopurine, Coconut water, Nodal explant, Root growth.

1. Introduction

C. nutans is an herbaceous plant and has been widely used as traditional medicine. To the best of our knowledge, coconut water (CW) effects on *C. nutans* root formation have yet to be reported. Therefore, this study explores CW's potential as an additional supplement for root regeneration.

2. Methodology

Sterile nodal explant was inoculated in Murashige and Skoog (MS) medium + 2 mg/L of Benzyl-aminopurine hormone. After eight weeks, regenerated shoots were excised and cultured on a rooting medium. For root formation treatments, MS medium + with different percentages of CW (0, 5, 10, 15, 20%) and 0.5 mg/L NAA. After six weeks, root growth and performance was measured.

3. Results & Discussion

0.5 mg/L NAA and 10% CW gives no significant difference in root formation percentage from studied explant, 67% and 57% respectively. An increase in CW concentration in MS medium had increased the potential of root formation and growth. Among all CW treatments, the maximum number (5) of roots and maximum root length (8.07 cm) of root per shoot was produced in the MS medium with 10% CW. CW contains many beneficiary compounds e.g. amino acids, organic acids, nucleic acids, vitamins, sugars, sugar alcohols and plant hormones. Adding coconut water provides a simple way to obtain satisfactory growth or morphogenesis [1]
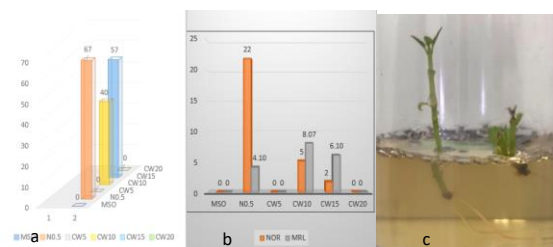
Figure 1. (a) Root formation percentage. (b) Number of root/shoot and maximum root length in centimeter (c) Roots regenerated in MS medium + 10% CW.

4. Conclusion

10% CW was the optimum concentration and significantly affected *in vitro* root growth of *C. nutans*.

Acknowledgments

Reference

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HIGH WATER ABSORBENT CONCRETE FOR DECORATIVE WALL

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1. Introduction

Being in the tropics, Thailand is usually hot and humid yet countries with winter experience a relative humidity of 60%, which is ideal for fungal growth. So, absorbing water is an effective method to remove moisture. Clay has a unique porous structure that allows it to absorb water molecules. As a result, adding clay to cement can improve its absorption qualities. The goal of this project is to improve water absorption properties of concrete.

2. Methodology

The concrete preparation are
1. Mix the clay and cement at a 50:50 weight ratio.
2. Mix all of the ingredients in a mixing bowl to get a uniform mixture.
3. Pour the mixture into the mold and wait for it to dry completely, which should take around 24 hours.
4. Finally, the mold was removed.

Sample characterization tested qualities of the resulting concrete includes:
1. Test for water and moisture absorption.
2. Modulus, which involves pressing the sample and measuring the force with which it was crushed until it fractured.

3. Results & Discussion

Figure 1 shows the concrete characteristics after a 24 hours of curing at a room temperature. The characteristics of concrete are listed in Table 2. Water absorption was 60.6 %, while humidity absorption was 1.51%. The pore structure's propensity where it absorbs water within the structure may have led to such findings. Modulus testing was used to evaluate the mechanical properties. The value was 0.89 MPa.

Figure 1. Cured Concrete

Table 2. Properties of concrete

Properties	Water absorption	Humidity absorption	Modulus (MPa)
Results	60.6(%)	1.51(%)	0.89

4. Conclusion

According to the results, the extremely absorbent concrete has been effectively created. It has a high water absorption capacity as well as a high humidity absorption capacity.

Acknowledgments

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HIGH FLAME RETARDANT ADHESIVE FOR FURNITURE INDUSTRIES

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Keyword: Adhesive, Flame retardant properties, Magnesium hydroxide .

1. Introduction

Glue is a fundamental component as furniture adhesion. It is a semi-liquid combination that binds materials together. Aside from the mechanical qualities, safety after incineration is also significant. Wood is a good fuel for fire, thus creating unsafe conditions. The goal of this study is to increase the flame retardant qualities of adhesives used in furniture manufacturing.

2. Methodology

Firstly, combine 5 g of magnesium hydroxide and 12.5 g RO water. A stirrer was used to mix the sample for ten minutes at 400 rpm. Stir add 50 g of glue, then stir for another 10 minutes to combine the mixed ingredients. Pour the mixture onto a clear plastic sheet. Allow 24 hours for the sample to dry completely at room temperature. Then, the obtained samples investigated the decomposition of glue with the DSC&TGA method. The flame rate was tested by horizontal flame spread mode. The results showed the spreading time at constant distance.

3. Results & Discussion

Figure 1 displays an adhesive with Mg $(OH)_2$ added to it. The cure time increases after adding Mg $(OH)_2$ from 5.16 hr to 5.30 hr. Results of flame retardant testing using DSC & TGA methodologies, which will be taken into account the temperature at which adhesive decomposes. The addition of $Mg(OH)_2$ enhanced the decomposition temperature by 27 °C and from the flame retardant test, the time was lowered from 309.75 °C to 61.05°C. This is due to the elimination of small water molecules in the decomposition process.

Figure 1. Adhesive hardening circumstances**.**

Table 1 A list of adhesive properties.

Materials	Setting time(hr)	Maximum (°C)	Flame retardant (mm/min)
Adhesive	5.16	343.33	309.75
Mg $(OH)_2$	5.30	370.50	61.05

4. Conclusion

The addition of $Mg(OH)_2$ of 10 phr to the adhesive resulted in having higher flame retardant qualities, according to the test results. The speed must be less than 75 mm/min to meet the criteria.

Acknowledgments

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PREPARATION AND NUTRITIONAL ANALYSIS OF STINGLESS BEE HONEY CANDY

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Keywords: Stingless bee honey, Nutrition analysis, Candy preparation.

1. Introduction

Stingless bees are stingless insects. They play an important role in pollination for biodiversity. The products obtained from Stingless bees are honey and propolis.Honey is an alternative source of health products because stingless bee honey has a wide range of biological activities, including anti-microbial,anti-cancer,anti-inflammator, antioxidant and it also has a wound-healing effect.Candy is one product that is consumed by all ages. Unfortunately, most of its ingredients contain sugar and can cause obesity and tooth decay. Nowadays, most people are increasingly interested in health care, whether it is exercise or food consumption.Therefore, processing liquid honey into candies may be an option for easier consumption and storage. It might be an alternative source of healthcare products in the future.

2. Methodology

Honey of *Tetragonula laeviceps* was used for the preparation of candy by mixing ingredients between stingless bee honey and maltodextrin in different ratios, 90:10-10:90, heated at 100, 80 and 60℃ for 15, 30, 45 and 60 min. and freezed for 10-15 min. Honey and candies were analyzed for their nutrition by following AOAC [1].

3. Results & Discussion

The best ratio for candy preparation is 70:30 between stingless bee honey and maltodextrin temperature at 80 °C for 45 minutes. Stingless bee honey candy is solid, brown, with a unique aroma. Nutrition values are shown in Table 1.

Table1. Nutrition analysis of honey and candy

Nutrition	Honey	Candy
%Moisture content	22.38	0.44
%Fat content	-	-
%Protein content	0.03	0.04
%Ash content	0.55	0.45
%Carbohydrate content	77.04	98.47
Energy (kcal/100g)	308.28	395.48

4. Conclusion

Stingless bee honey candy is solid, brown, with a unique aroma. The nutritional value of this candy is quite close to honey. Thus, it may be in demand in the healthcare market because honey has a variety of properties.

Reference

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SERUM DEVELOPMENT BASED ON THE ANTIOXIDANT ACTIVITY AND PHYTOCHEMICAL OF *Etlingera elatior*

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Keywords: Antioxidant activity, *E. elatior*, Natural product, Phytochemical, Serum development.

1. Introduction
E. elatior (EE) or bunga kantan has antioxidant properties and various phytochemicals such as phenols, glycosides, flavonoids, tannins, steroids, saponins and terpenoids [1]. Due to the presence of antioxidant agents in EE, more research is needed as they can be contributed to natural products.

2. Methodology
Extraction of dried EE using Soxhlet extractor and rotary evaporator was made. The percentage yield was calculated using equation (1).

$$Yield\ (\%) = \frac{crude\ extract's\ mass\ (g)}{dry\ sample's\ mass\ (g)} \quad (1)$$

The antioxidant activity of EE was tested using DPPH assay. Phytochemical Screening Tests of EE were conducted such as alkaloid, saponin, carbohydrate, flavonoid, phenol, tannin, glycoside, terpenoid and steroid. In the serum development of the EE stage, simple ingredients were used to develop this serum. Serum was observed after a week.

3. Results & Discussion
3.1 Percentage yield of EE extract
The percentage yield obtained was 29.61%.

3.2 DPPH Assay of EE
Figure 1, shows that EE obtained 79.72% of inhibition nearer to AA at 2×10^4 mg/L. Thus, EE has a good antioxidant activity.
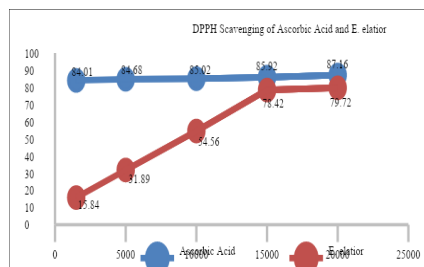
Figure 1. DPPH Scavenging Activity of AA and EE

3.3 Phytochemical Screening Test of EE
Only alkaloid, carbohydrate and glycoside gave negative results.

3.4 Serum Development of EE
The serum produced a fragrance half white colour and has pH value 5.93. The condition of serum in cool temperature is better than in hot temperature.

4. Conclusion
EE is a good antioxidant and has many phytoconstituents thus, can be developed into natural products.

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GREEN SYNTHESIS OF CARBON AND GOLD NANOPARTICLES FROM COCOA POD HUSK FOR POTENTIAL CALORIMETRIC BASED PESTICIDE IDENTIFICATION

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Keywords: Gold nanoparticles, Carbon nanoparticles, Green economy, Cocoa pod husk.

1. Introduction
Carbon based and metal nanoparticles (NPs) are used in many different areas including the agriculture sector. The synergy of nanotechnology with green chemistry offers development of novel and necessary products which benefit both human and environment, and there is an expectation of USD 65.5 billion in revenue generated by these products by the end of 2020. CPH is a byproduct of the cocoa industry [1]. CPH waste extract can be utilized to synthesize carbon dots (CDs) and gold nanoparticles (AuNPs) to be used as a colorimetric identification for various agricultural pesticides.

2. Methodology
2.1. Synthesis
The CDs and AuNPs are obtained with a simple one-step synthesis by utilizing CPH extract.

3. Results & Discussion
The synthesis, structural and optical properties, as well as photoluminescence mechanisms of prepared nanoparticles are reviewed. These NPs also underwent characterization to show its presence by a facile method of reducing CPH into nanomaterials. The characterizations include the UV-Visible spectrophotometer and the Fourier Transform Infrared (FT-IR). The results confirm the presence of these NPs.

Furthermore, the NPs exhibited fluorescence properties when exposed to UV light. To determine the toxicity, the NPs are tested on brine shrimps. It proves that these NPs are non-toxic.

4. Conclusion
Both CDs and AuNPs possess unique optical properties coupled with high extinction coefficient and are suitable for naked-eye colorimetric identification to strive with analytical techniques available like UV visible absorbance. By using CPH as precursors for synthesis of green CDs and AuNPs nanomaterials offer creative solutions for agricultural problems.

Acknowledgments

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CONTACTLESS AND AUTOMATIC HAND SANITIZER BASED ON ARDUINO MICROCONTROLLER AND ULTRASONIC SENSOR (ARDUIZER) FOR COVID-19 PREVENTION

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Keywords: Arduino, ArduiZer, Covid-19.

1. Introduction

Contaminated surface has become an issue during this time of pandemic, as viruses like COVID-19 are proven to be able to linger on mediums like doorknobs, pipes and basins for hours and become one of major sources of infection. Frequent hand-washing and sanitizing are strongly advised to overcome possible virus spreading through hands, but still they require the act of touching the containers of the detergent or sanitizer. To add on and contribute further to the available solutions, we invented an electronic device called *Arduizer*; an automated device that eliminates the need for touching the surface during the hands cleaning process.

2. Methodology

This special innovation detects the hand gesture by using a motion sensor and automatically dispenses a specific volume (2ml) of sanitizer, which is enough to eliminate any viruses caught on the users' hands. The device is controlled by a microprocessor called *Arduino* besides other important components like sensor, pump and power source.

3. Results & Discussion

Figure 1, shows our electronic device which is ArduiZer.

Figure 1. ArduiZer

4. Conclusion

It is very easy to build, very cheap and very user friendly. *Arduizer* also has a very great potential to be used in many other applications with very minor modification on either the hardware or the coding parts.

Acknowledgments

We would like to thank International Islamic University Malaysia (IIUM) and Physics Department, Kulliyah Of Science, IIUM Kuantan for their support.

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THE FORMULATION DEVELOPMENT OF ALGINATE BEADS FOR PROBIOTIC ENCAPSULATION USED IN FOOD PRODUCT APPLICATIONS

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Keywords: Alginate, Probiotic encapsulation, Hydrogel, Rheology.

1. Introduction

Alginate is a highly versatile biomaterials widely researched and utilised in various industries. Properties include biocompatibility, low toxicity and cost effective, chemically set polymer using calcium salt (i.e., Ca^{2+}) [1].

2. Methodology

2.1. Formulation of alginate beads

Alginate beads of various concentrations were developed using an extrusion technique. Sodium alginate solutions (dissolved in phosphate buffer at pH 4) were dripped into 1% (w/v) of $CaCl_2$ for gelation. Fresh beads were collected after 15 minutes, rinsed, and dried on coffee filter papers.

2.2. Rheological pre-studies

Shear rates were applied to each sample on a cone and plate rotational rheometer. Data was collected to construct graphs of shear stress against shear rate (Fig.1.b). Analysis on the evolution of apparent viscosity against its shear rate is performed to investigate beads' rheological behaviour.

3. Results & Discussion

Spheric and clear beads (as in Fig.1.a) were produced throughout the experiment with an average diameter of 4 mm.

Figure 1b shows a persistent decrease in apparent viscosity which indicates the shear-thinning properties of beads. All samples showed the same rheological behaviour as Figure 1b.

4. Conclusion

Alginate beads were produced successfully and possessed shear-thinning properties, a desirable trait to suit oral processing conditions. Further investigations will be performed on its stability, and viability on encapsulated probiotics.

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(a)　　　　　　　　(b)

Figure 1. a) Fresh alginate bead (~3mm ⌀) **b)** Shear stress against shear rate graph

NEW FUNDAMENTAL THEORY IN SOLVING THE ROYALTY PAYMENT PROBLEM

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Keywords: Optimal control, Royalty payment, Shooting method.

1. Introduction
This study focused on the non-classical Optimal Control problem (OCP) where the final state value is unknown [1]. This produces a necessary boundary condition of the final costate value which is not equal to zero. Moreover, the functional performance index is in terms of the royalty function of the unknown state value at the terminal time [2,3].

2. Methodology
In this study, the royalty function that is in terms of the three-stage piecewise function will be applied, and then, the function will be approximated into the continuous approximation of the hyperbolic tangent (tanh) procedure. The modified shooting method which is a combination of the Newton and Golden Section Search method was applied for settling the Two-Point Boundary Value Problem (TPBVP)

3. Results & Discussion
Finally, the results will be contrasted with the discretization techniques which are the Euler, Runge-Kutta, Trapezoidal, and Hermite-Simpson approximations as a validation procedure

4. Conclusion
This will give a huge contribution towards the engineering field such as information engineering and financial engineering where this research will provide useful knowledge in the mathematical form by relating to the OC theory. The knowledge can be applied in problem-solving, and then, reducing the time consumed during the process

Acknowledgments

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NUTRITIOUS MENU SYSTEM FOR MALAYSIAN RELIGIOUS PRIMARY SCHOOL CHILDREN TO IMPROVE GOOD MEMORIES

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Keywords: Balance menu, Binary programming, Menu planning, Optimization, Sensitivity analysis.

1. Introduction
Religious (Tahfiz) school students aged 7-12 need to eat nutritious meals which contain proper calories and nutrients for appropriate development with a specific end goal to repair and upkeep the body tissues. It averts undesired diseases and contamination [1,2,3].

2. Methodology
Serving healthier food is a noteworthy stride towards accomplishing that goal. However, arranging a nutritious and balanced menu manually is convoluted and tedious. This study aims to develop a mathematical model with an optimization technique for menu scheduling that fulfills the whole supplement prerequisite for religious school student, reduce processing time, minimize the budget and serve assortment type of food each day

3. Results & Discussion
The mathematical model with an optimization technique for menu scheduling additionally gives the flexibility for the cook to choose any food to be considered in the beginning and within the process. This is called sensitivity analysis. A recalculation procedure will be performed in light of the ideal arrangement and seven days menu. The data was gathered from the Malaysian Ministry and school authorities. Menu arranging is a known optimization problem.

4. Conclusion
A binary Programming alongside optimization technique and "Sufahani-Ismail Algorithm" utilized to take care of this issue while improving good memories for the children.

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CARBON-FREE ENERGY USING MODIFIED LaSrCoFeO₃ CATHODE NANOPARTICLES FOR PROTON CERAMICS FUEL CELL

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Keywords: Modified cathode, PCFC, Sol-gel, Symmetrical half cell.

1. Introduction

Reducing operating temperatures creates high polarization resistance (R_p) to the Proton Ceramic Fuel Cell (PCFC) system. Thus, in this work, LaSrCoFeO₃ (LSCF) was modified through internal and external approaches. As the reduction in the R_p was observed then the modified LSCF has a good potential to become cathode material for clean energy devices.

2. Methodology

The in-house developed ultrafine *m*-LSCF and BCZY powder were synthesized via modified sol-gel method [1]. A symmetrical half-cell of *m*-LSCF|BCZY|*m*-LSCF was fabricated using dry pressing and spin coating techniques. The surface of LSCF thin film was modified by dipping it into zirconyl chloride solution for 120 seconds and then subjected to electrocatalytic study using EIS.

3. Results & Discussion

The ASR value of the modified cathode was 0.116 $\Omega.cm^2$ in-line as reported by [2]. The surface modification has extended the meeting point between electrolyte, electrode and gas phase and promotes more surface active regions for high electrochemical reaction without segregation of strontium.
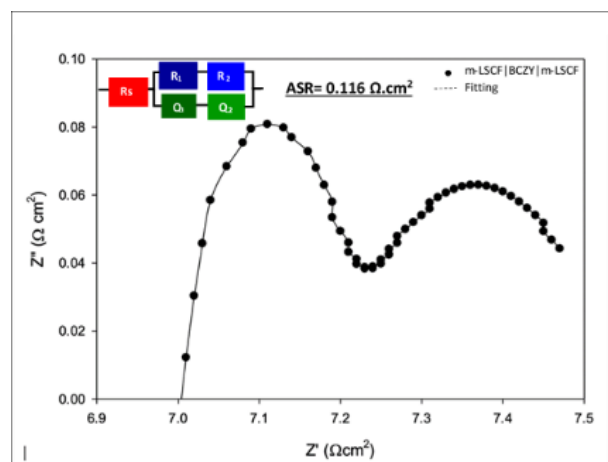
Figure 1. EIS spectrum under air containing atmosphere at 800°C.

4. Conclusion

The fabricated LSCF cathode shows low ASR value of 0.116 $\Omega.cm^2$ due to the high surface-active site available for electrochemical reaction.

Acknowledgments

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FORMULATION AND EVALUATION OF HERBAL LIPSTICK FROM NATURAL OIL

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1. Introduction

Cosmetics have been in high demand since ancient times. Lipstick formulas are primarily employed for improving the beauty of the lips and adding glamor to the make-up. The term "herbal" alludes to a symbol of safety that has no negative consequences. So, natural remedies are becoming increasingly popular among customers. Nowadays, natural lipstick is developed and tested in order to eliminate the negative impacts of synthetic dyes in lipstick formulation and to boost the use of organic compounds colors. The commercial formulation is compared to several parameters of the herbal lipstick.

2. Methodology
2.1. Ingredients and manufacturing procedure (Table 1.)

Table 1. Excipients with their prescribed quantities in the formulation of lipstick

Ingredients	F1	F2	F3	F4
Jojoba oil (ml)	5	11	15	20
Coconut oil (ml)	4	6	6	8
Peppermint oil (ml)	3	3	3	2
Beeswax (g)	5	9	9	4
Zinc oxide (ml)	0.5	0.5	0.5	0.5
Rose extract (ml)	1	1	1	1
Red 40 Lake (g)	12	3	7	5
Red 21 Lake (g)	-	2	-	-
Jasmine rice extract (ml)	15	16	15	15
Phenoxyethanol (ml)	3	3	3	3

2.2 Evaluation of lipstick

The melting point, skin irritation test, aging stability, force of application, pH and color, and texture are all examined.

3. Results & Discussion

Many natural components have been utilized to formulate lipsticks including coloring agents and to explore the effect of various natural ingredients on different assessment factors in the formulation. Evaluation results are shown in Table 2 below. The natural lipstick, F4 was considered to be the best of the three lipstick formulas. As a result of the current analysis, it was determined that this created natural lipstick has minimum and no side effects, resulting in the greatest positive effect on the lips.

Table 2. Evaluation of lipstick and comparing with marketed lipstick

Evaluation parameters	Herbal lipstick (F4)	Marketed lipstick
Melting point	75 °C	62 °C
Skin irritation test	No	No
Aging stability	Smooth	Smooth
Force of application	Good	Good
pH	6.5	6.8
Colour and texture	Red pink and smooth	Red and smooth

4. Conclusion

Among the three lipstick formulations, F4 was the best natural lipstick. Besides, rose extracts can effectively help antioxidants and reduce mouth cracks.

Acknowledgments

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E-MELATI DISCOVERY SYSTEM

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Keywords: E-Melati discovery system, Management, Students, SDLC, UiTM.

1. Introduction

The management of Kolej Melati uses manual approaches that consume time and must undergo several procedures before submitting their daily duty report or checking students' data and current status and managing any college's activity. So, the E-Melati Discovery System was utilized in Kolej Melati to improve management online and it is integrated with the current Universiti Teknologi Mara (UiTM).

2. Methodology

The E-Melati Discovery System follows the Systems Development Life Cycle Model (SDLC) which provides a systematic process for the implementation of software projects. This system also uses PHP language, AJAX JQuery, and MySQL Database.

3. Results & Discussion

The management system is categorized into three modules which are eSRK where it collects the daily duty report of College Resident Staff as shown in Figure 1, eCoupon for the student to monitor their involvement in college activities, and eProgramme that allows the College Representative Committee to manage any progress of the college's activities. Meanwhile, the reporting system is categorized into two which are OFFA reporting which is a feedback form of college activities as shown in Figure 2, and Student Tracking shown in Figure 3.

Figure 1: eSRK system   **Figure 2**: eProgramme system

Figure 3: Student tracking system

4. Conclusion

The E-Melati Discovery System is very efficient as it helps the Management of Kolej Melati to accomplish more in less time and hope to give benefits if applied by all colleges in Universiti Teknologi MARA (UiTM) throughout Malaysia.

Acknowledgments

We would like to express our deepest gratitude to everyone that has been helping a lot in terms of ideas and encouragement along the way of preparing this E-Melati Discovery System.

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SOCIAL DISTANCING MONITORING SYSTEM USING DEEP LEARNING

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1. Introduction

COVID-19 has been declared a pandemic in the world in 2020. The World Health Organization (WHO) reported, one of the ways to prevent the disease from spreading is by keeping distance from other people. This project proposed object detection using a deep learning approach to help the authorities to monitor social distancing in crowded places.

2. Methodology

You Only Look Once (YOLO) v4, Faster Region-based Convolutional Neural Network (R-CNN) and Multibox Single Shot Detector (SSD) which are deep neural network algorithm for person detection are being applied for person detection with Microsoft Common Objects in Context (MS COCO). The system will detect persons in the frame and calculate the distance between them using Euclidean Distance. The risk percentage is then calculated to determine the percentage of violation in the frame.

3. Results & Discussion

In a model testing, YOLOv4 shows the highest mean average precision (mAP) score while SSD is the lowest but within the best speed based on its frame per second (FPS). Table 1 shows the summary of the model performance for person detection using different deep learning algorithms detection for the person COCO dataset.

Table 1. Performance metrics for person detection

	YOLOv4	Faster R-CNN	SSD
Precision	0.77	0.72	0.49
Recall	079	0.75	0.89
F1-score	0.78	0.73	0.31
mAP	82.47%	66.10%	41.34%
FPS	12~17	7~8	49~54

4. Conclusion

YOLOv4 has been chosen to be implemented in the system as it produced the best mAP compared to other detection models with a balanced speed.

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SHROOMAGE: A BUTTON MUSHROOM DETECTION AND MEASUREMENT SYSTEM USING IMAGE PROCESSING

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Keywords: Button mushroom, Deep learning, Detection, Image processing, Measurement.

1. Introduction

Traditional button mushroom cultivation requires the farmers to observe the mushrooms' condition from time to time, which is time consuming and a waste of human resources. In this work, an automated mushroom counting and measurement system is developed that uses image processing techniques to monitor the amount and size of button mushrooms. The system consists of an image processing algorithm based on a deep learning method called convolutional neural network (CNN). Therefore, the growth of the button mushrooms can be monitored from remote locations at any given time that will improve the quality of the button mushrooms and the efficiency of the production management.

2. Methodology
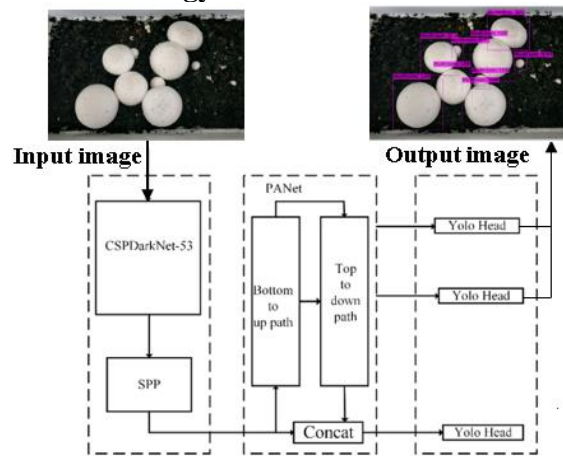
Figure 1. Architecture of the system

Figure 1 shows the architecture of the mushroom detection and measure system based on CNN algorithm models using YOLOv4 real-time object recognition system that can recognize multiple objects in a single image frame, such as button mushrooms.

3. Results & Discussion

Figure 2 shows the output image showing the button mushrooms are detected and labelled. The diameter of all mushrooms has also been measured successfully. The diameter of each mushroom is listed in the text file as shown in the left image.
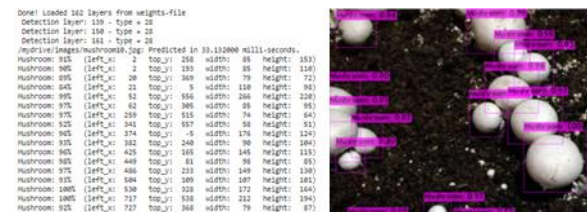
Figure 2. Figure Header

4. Conclusion

The product is predicted to significantly impact the button mushroom cultivation industry by providing automated solutions that can improve production time by automatic growth detection and reduce cost of manpower for mushroom growth monitoring.

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HIGH SELECTIVITY OF ECO-FRIENDLY EPOXIDE FROM PALM OLEIC ACID

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1. Introduction

Polyols can be made from a variety of different feedstocks. At the moment, petroleum is the most commercially viable choice. There are several issues with this feedstock, both in terms of production costs and environmental consequences [1]. Because petroleum sources are dwindling, rising market demand drives up feedstock prices. Petroleum as feedstock has more negative environmental consequences.

2. Methodology

2.1. Materials

Palm oleic acid was purchased from Chung Chemical Sdn. Bhd. Formic acid (2M, concentration: 85%) and hydrogen peroxide (3.5M, concentration: 30, 35, and 40%) were purchased from Merck Sdn. Bhd.

3. Results & Discussion

The ratio of the desired product formed to the undesired product formed is the selectivity of a reaction in chemical engineering. Chemical selectivity refers to a reagent's ability to discriminate between two or more substrates or two or more positions within the same substrate in a competitive attack [2].
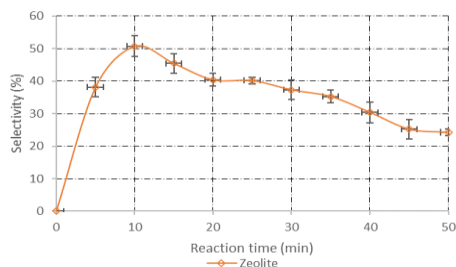
Figure 1: Selectivity of epoxidized palm oleic acid

4. Conclusion

Due to the cost and environmental impact of the feedstock, epoxidized vegetable oil has become increasingly important in recent years. Today, petrochemicals are used as a raw material in the formation of epoxide groups, which has cost and environmental implications.

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FACE MASK DETECTION AND FACE IDENTIFICATION BASED ON IMAGE PROCESSING

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Keywords: Artificial intelligence, Deep learning, Face mask detection, Image processing, Neural network.

1. Introduction

The sudden COVID-19 pandemic outbreak has caused the world to panic on how to counter the virus. Governments all over the world are facing huge problems in making sure the citizens abide by the virus outbreak prevention rules [1]. There are still stubborn people who are roaming in public spaces without abiding the imposed laws during this crisis period causing a rise in the number of COVID-19 cases daily report. The main aim for this project is to detect and identify the identity of human faces wearing a face mask.

2. Methodology
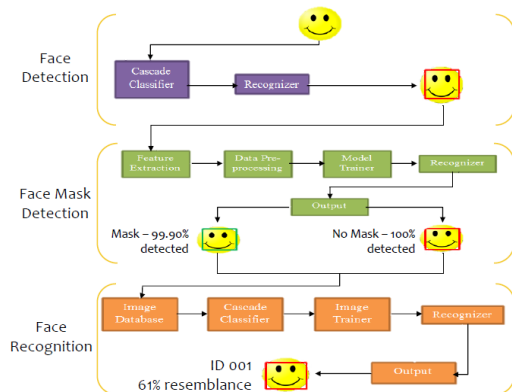
Figure 1. Overview of the proposed system

Figure 1 shows the overview of the proposed system consisting of face detection, face mask detection and face identification systems. The face detection algorithm utilizes a cascade classifier to extract the features of a human face from the input. Then, the detected human face is sent to a face mask detector algorithm based on Convolutional Neural Network (CNN) for face mask detection. The image is sent to a face identification algorithm based on a cascade classifier to identify the person.

3. Results & Discussion

Currently, the work has separately developed the face mask detection and face identification of a subject successfully as shown in Figure 2. Next is to merge both.

Figure 2. Face mask detection (left) and face identification (right)

4. Conclusion

The project is expected to act as a supporting way of reducing the spread of the deadly Covid-19 virus by ensuring people abide by the law.

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WASTE vs. WASTE:
ULTIMATE WASTEWATER TREATMENT PROCESS

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1. Introduction

Metacetaldehyde is a snail bait or molluscicide applied to protect plants from snails [1]. The toxic waste of this element contaminated adjacent water sources (rivers and drainage) and directly affected human beings, animals and plants. This invention proposed a solution to remove this snail bait from the wastewater system by exploiting new wastewater technology. Wastewater is often stigmatized as dirty, smelly, disgusting and polluting; however, in this invention, we reuse waste to treat waste.

2. Methodology
2.1. Materials and methods

Typical-sludge aerobic granules (t-SAG) and enhanced-sludge aerobic granules (e-SAG) were developed from rubber and sugarcane by-product wastewater. The t-SAG and e-SAG were cultivated in a small-scale column in a sequence batch procedure. The aerated sludge from latex wastewater was inserted as a starter to commence the development of t-SAG. Artificial wastewater consisting of different chemicals are mixed and introduced into the small-scale column to feed the microorganisms in the aerated sludge. The t-SAG established from the small-scale column were supplemented with sugarcane by-product, and finally known as e-SAG. The characteristics of SAG (macro and microstructures, biomass concentrations and elimination performances) were monitored.

3. Results & Discussion

The t-SAG and e-SAG successfully removed Metacetaldehyde in wastewater due to the colonization of various microorganisms.

4. Conclusion

A wastewater treatment plant using aerobic granulation technology can be set up near polluted areas to treat the effluent of wastewater containing Metacetaldehyde. This invention is looking forward to providing better pollution management and sustainable development in Malaysia, especially in wastewater treatment prospects.

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ENHANCING USER EXPERIENCE USING AUGMENTED REALITY IN MUSEUM

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Keywords: Augmented reality, Museum, Interactive design, User experience.

1. Introduction

A museum can be a suitable context to experiment with a new interaction technique which guides visitors and improves their experiences for a successful learning environment and also to enrich user experience. Mobile technologies are used to enhance user experience in a cultural environment that offers more information than physically exposed technology [2]. Therefore, the introduction of augmented reality (AR) allows visitors to experience interaction in a way that increases knowledge, learning and gives additional information with any artefact exhibits in the museum.

2. Methodology

The methodology applied in the research is ADDIE Model [1]. This project is designed and developed by applying principles of interactive design consistency, perceivability, learnability, predictability and feedback [3] and evaluated using the principle of user experience. Figure 1 shows the experimental design of this project.

3. Results & Discussion

The result shows most respondents are satisfied, and usage of mobile AR has enhanced their navigation experience during their museum visits. It also gives a lot of new insight of the displayed historical artefact.
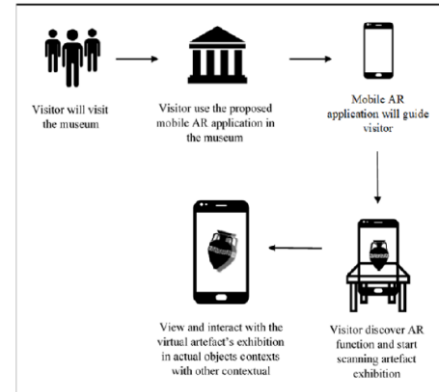
Figure1. Experimental design

4. Conclusion

Augmented reality features can also be improved in future research. This includes having more features to the 3D AR artifacts. Furthermore, the 3D AR artefact can be enhanced to be more realistic.

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DESIGN AND BUILD A WATER HEATING SYSTEM USING A HELICAL TYPE HEAT EXCHANGER BY UTILIZING THE EXHAUST HEAT OF THE AIR CONDITIONER CONDENSER

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Keywords: Air conditioner, Helical type heat exchanger, Water heating system.

1. Introduction

To take advantage of the heat energy wasted from any Air Conditioning (AC) system so that it is not wasted and does not cause global warming, a heat exchanger (water heater) is designed [1]. The form of wasted heat energy utilization is to add pipes from the compressor to the condenser. An Air Conditioner (AC) water heater tube installed in the AC system functions as a heat exchanger to absorb heat from the refrigerant pipe out to the compressor so that the water becomes hot and stored for later use.

2. Methodology
2.1. Equations

$$v = \pi r^2 . t \qquad (1)$$

$$Q = m_{water} . C_{water} . \Delta t \qquad (2)$$

3. Results & Discussion

From the planning, Figure 1 and Table 1 show the results obtained from the copper pipe heating material with a diameter of 0.00635 m, a pipe length of 8 m, and a total of 10 turns.
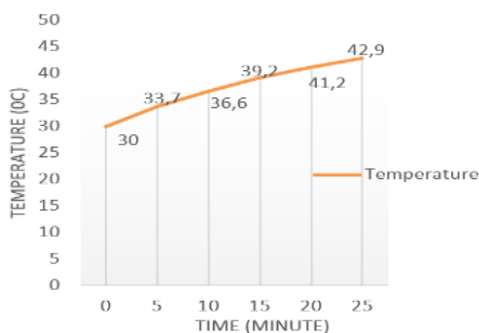
Figure 1. Graph of the Increase in Water Temperature from the use of heat from the AC Condenser

Table 1. Water Temperature Increase

No	Time (Minute)	Temperature (°C)	Current (Ampere)
1	0	30	4
2	5	33.7	4.2
3	10	36.6	4.4
4	15	39.2	4.6
5	20	41.2	4.2
6	25	42.9	4.3

4. Conclusion

From the trial results of the design of the heat exchanger (water heater), it was found that the water temperature increased by 42 liters by 50°C within 60 minutes and can be used for daily needs such as bathing, washing, and others.

Acknowledgments

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SECONDARY SEX CHARACTERISTICS OF ODESSA BARB (*Puntius padamya*)

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Keywords: Odessa barb, Secondary sex, Morphometric.

1. Introduction

Odessa Barb (*Puntius padamya*) is an ornamental fish that was discovered in 2008 in the Ayeyarwaddy irrigation canal in Mandalay, Myanmar. Reproductive aspects of this fish are still not widely found in the literature, one of which is secondary sexual characteristics. The purpose of this study was to determine the secondary sex characteristics of Odessa barb so that it is useful in determining sex for spawning season.

2. Methodology

Secondary sex characteristics is defined by its dichromatism of meristic and body morphometric, dimorphism visualize by red colour in the lateral line and red spot on eyes of male and female fish were measured and observed visually.

3. Results & Discussion

The results of visual observations of male odessa fish shows a red color in the lateral line and red spot on the eyes while the female fish have no red color in the lateral line and eye. The results of morphometric measurements showed that the leanness of male fish was smaller than the females (males 0.37 ± 0.04 and females 0.38 ± 0.03). The size of the male fish head is smaller than the female (0.76 ± 0.08 male and 0.99 ± 0.39 female). The fins of male fish are longer than the female (male 0.10 ± 0.04 and female 0.08 ± 0.03).

Table 1. Morphometric Ratio

Morphometric	Male	Female
Body slenderize	$0.367483\pm$ 0.035566466	$0.38115\pm$ 0.032987312
Head size	$0.758038\pm$ 0.076798657	$0.992121\pm$ 0.389412215
Body size	$1.888975\pm$ 0.300516121	$1.514654\pm$ 0.205101727
Length of pectoral fins	$0.102126\pm$ 0.036539107	$0.082092\pm$ 0.025822707

4. Conclusion

From the observations there are significant differences in male and female Odessa fish seen from the color, body slenderize, head size, and pectoral fin length.

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BRAINWAVE SIGNAL OF COGNITIVE ACTIVITIES FOR DYSLEXIA CHILDREN

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Keywords: Theta, Alpha, Beta, Dyslexia, EEG.

1. Introduction
Neuron activities can be observed using sensitive diagnostic instruments like EEG that calculates brain electricity/ brainwave behavior [1] and tracks variations in milliseconds [2]. EEG calculates voltage fluctuation effects from ionic current inside the brain function application/neurons which has many features. Most neurological signals are in the range of 1–20Hz. Electroencephalogram is divided into four primary key signal types: beta wave, alpha wave, theta wave and delta wave [3].

Figure 1. Flowchart of methodology

2. Methodology
10 dyslexia children under PPD Batu Pahat brain activities were examined. Key signals types: beta wave, alpha wave, theta wave were identified.

3. Results & Discussion

This finding is focused on evaluating data emitted by the subject's brain during cognitive activity for dyslexia signals. The analysis of brainwave signals shows the beta subband is more prominent than alpha and theta subband. The minimum beta subband value is 0.0141db while the maximum beta subband value is 1.1601db. Next, the minimum alpha subband value is 0.0126 db, the maximum alpha subband value is 0.1678 db. Lastly, the minimum value for theta subband is 0.0410 db, the highest value for theta subband is 0.2791 db.

4. Conclusion
The result indicates Beta signals are more dominant than other signals in cognitive function for children with dyslexia.

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THE DEVELOPMENT OF SOLAR POWERED MOTOR GENERATOR FOR STALL HAWKERS (SPMG)

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1. Introduction

The increase of energy demand, stimulated by developing countries and consequent decrease of power sources, leads to an unsustainable future. Thus, renewable and clean energies are necessary. It will also determine the efficiency rate when compared with the other generators already being in the market. This device will have a better efficiency rate and be economical to the hawkers that will be fully modular, which means it can be assembled and disassembled. Thus, it's free and saves electricity cost in our house or even getting much healthier foods in night markets.

2. Methodology

This project will include working with both hardware and software. The hardware will include the materials such as the fan motor, two acid lead battery, Arduino microcontroller, printed circuit board (PCB), alternator and so on. The hardware materials will be purchased either locally or used from our house appliances.

3. Results & Discussion

The procedure of standard operation will explain how SPMG works. The generator is an innovative generator that is designed for the usage of night market hawkers. This is to propose an advanced generator that allows electricity to be generated without using petrol or kerosene to start a generator . Thus, it eases us from any health disease. SPMG will be tested and analyzed. Its finding will determine the rate of efficiencies as to improve its sustainability as well as its convenience for the consumers.

Figure 1. SPMG

4. Conclusion

SPMG is a mini green power plant which converts kinetic energy from the AC Motor into a more usable electrical energy. This device is fully modular. SPMG will solve the problems and reduce air pollution at night markets. SPMG also can be a backup generator when there is a current shortage happening at our houses. Lastly, it is also compact and small and easy to carry wherever we go.

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SECONDARY SEX CHARACTERISTICS OF SILVER RASBORA (*Rasbora argyrotaenia*)

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Keywords: Silver rasbora, Secondary sex, Morphometric.

1. Introduction

Silver rasbora (*Rasbora argyrotaenia*) is a freshwater fish that is commonly found on the islands of Sumatra, Kalimantan and Java. This regulated fish can be used as commodities in the cultivation of consumption fish and ornamental fish. There is not much literature on the secondary characteristics of this fish. The purpose of this study was to determine the characteristics and characteristics of the secondary sex in wader fish so that it is expected to be useful for the sexes in spawning and cultivating wader rays.

2. Methodology

Secondary sex characteristics (dichromatism and dimorphism) in male and female silver rasbora were measured and observed visually. The observed dimorphism characteristics were meristic and body morphometric. The observed dichromatic characteristics were color differences.

3. Results & Discussion

The results of visual observations of male silver rasbora have a pale color and the linea lateralis is not so bright, while the female silver rasbora have a darker color and brighter linea lateralis. The results of morphometric measurements showed several differences, including the slenderness of male fish which was smaller than female fish (0.23 ± 0.007 mm male and 0.42 ± 0.042 mm female). The head size of male fish is smaller than that of female fish (male fish 0.63 ± 0.19 mm and female fish 0.64 ± 0.33 mm). The fins of the male silver rasbora are longer than that of the female fish (male 0.16 ± 0.033 mm and female fish 0.11 ± 0.054 mm).

Table 1. Morphometric ratio

Morphometric	Male	Female
Body slenderize	0.23627± 0.007998541	0.42972± 0.428040201
Head size	0.63920± 0.197342668	0.64682± 0.331723247
Body size	3.02770± 0.172200403	2.88507± 0.391761158
Length of pectoral fins	0.16411± 0.033511659	0.11614± 0.054710442

4. Conclusion

From the observations there are significant differences in male and female wader stingrays seen from the color, body slenderness, head size, and pectoral fin length.

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EFFICACY OF CERAMIC SLUDGE DUST (CSD) STABILISER ON THE STRENGTH PROPERTIES OF STABILISED LATERITE SOIL

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Keywords: Industrial ceramic sludge, Low-Flood plain, Soil stabilization.

1. Introduction
Ceramic is largely used as a raw material in the manufacture of architectural finishes. The production of this material produced a significant amount of waste that is polluting and cumbersome. This study explored the possibility of using ceramic sludge dust as a stabilizer in stabilizing laterite soil, which is commonly used for road pavements and construction foundations.

2. Methodology
Laboratory experiments were conducted to evaluate the engineering properties of stabilized materials after curing for 7, 28, 60, 180, and 365 days. Cylinders of dimension 50 mm in diameter and 100 mm in height were made using locally available laterite soil stabilized with varying mix design composition incorporating industrial wastes. Laterite soils were stabilized with 100% ceramic sludge dust (S_1), a combination of S_1 with traditional binder Portland Cement, S_2 (50:50 and 70:30) ratios and incorporating GGBS in the combination of S_3 (10:40:50 and 20:30:50) ratios using 10%, 20% and 30% dosages.

3. Results & Discussion
The UCS test findings demonstrate that the strength of both S_2 and S_3 systems increases over the curing period. The most significant strength improvement was observed for the S3 system (at 10:40:50). With respect to the strength increase, there is seemingly no substantial improvement of increasing the CSD content for S_2 and S_3. Overall, S_3 systems were observed to show optimal durability performance in the durability index test. It was observed that the S_2 systems exhibited higher linear expansion compared to S_3 systems in the entire stabilizer systems under investigation. The CBR values of the soil sample increased from 7% to 71% for S_2 systems while the maximum value for CBR attained was 125% for S_3 systems.

4. Conclusion
The findings indicate that employing CSD as a blended binder improved the strength of the stabilized materials.

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THE DEVELOPMENT OF ANODE FUNCTIONAL LAYERS TO ENHANCE THE PERFORMANCE OF PROTON CERAMIC FUEL CELL

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Keywords: Functional Layer, NiO-BCZY, BCZY, PCFC.

1. Introduction
In this study, the anode functional layers (AFLs) were introduced into a cell with configuration of NiO-BCZY|BCZY|LSCF by targeting the increment in its performance. The cell's microstructure with and without AFLs were also compared and analyzed.

2. Methodology
2.1 Button cell characterization
The microstructure and electrochemical performance of the fabricated button cell with and without AFLs was studied using Scanning Electron Microscope (SEM) and ZIVE SP2 Electrochemical Workstation, respectively.

3. Results & Discussion
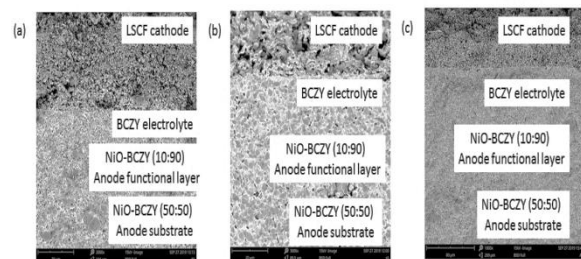
Figure 1. Cross section Images of Button Cell with (a) 1 Layer of AFL (b) 2 Layers of AFL (c) 3 Layers of AFL.
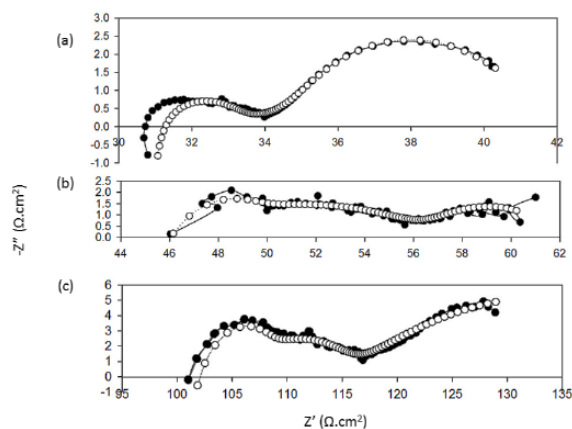
Figure 2. Impedance Spectra of Single Cell with (a) 1 Layer of AFL (Cell A) (b) 2 Layers of AFL (Cell B) © 3 Layers of AFL (Cell C) at 800°C

4. Conclusion
The design of button cells with different AFL thickness gives significant impact on the performance of PCFC as hydrogen energy devices.

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FOUR DIFFERENT GRADING OF AGARWOOD OIL CLASSIFICATION TO IMPROVE THE PERFORMANCE OF MODELLING BASED ON MULTICLASS SUPPORT VECTOR MACHINE

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Keywords: Agarwood oil, Support vector machine.

1. Introduction

Agarwood oil is highly prized for its value functions [1]. However, a review from other researchers' study found that the grading of agarwood oil process has been conducted by using only human sensory panels. With the availability of recent data analysis technology, it can be conducted to their respective grades by analyzing their chemical profiles. This paper is focused on the Support Vector Machine as the main model to classify the agarwood oil to respective grades.

2. Methodology

Figure 1. Block diagram of experimental work

Figure 1 shows a block diagram of experimental work. The simulation of an intelligent model has been conducted by using Matlab software version r2020a to classify four different qualities of agarwood oil.

3. Results & Discussion

Each of the performance criteria in Table 1 have achieved 100% during confusion matrix between predicted quality and actual quality comparison.

Table 1. Performance criteria

	LvsA	MLvsA	MHvsA	HvsA	Avg Acc	Avg Sen	Avg Spec	Avg Pre
Accuracy	100%	100%	100%	100%	100%			
Sensitivity	100%	100%	100%	100%		100%		
Specificity	100%	100%	100%	100%			100%	
Precious	100%	100%	100%	100%				100%

4. Conclusion

By improvising Support Vector Machine using Multiclass classifier and One versus All strategies, findings have revealed product-excellent performance criteria in agarwood oil classification can be achieved.

Acknowledgments

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SECONDARY SEX CHARACTERISTICS IN ROSY BARB (*Puntius conchoniusis*)

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Keywords: Rosy barb, Secondary sex, Morphometric.

1. Introduction

The Rosy Barb Barbir, *Puntius conchoniusis* is cypriniform, a member of the family Cyprinidae, and a tropical aquarium model. Most researchers have only studied female Rosy Barb rather than the males because of the difficulties in distinguishing them. The main objective of the present study was to describe secondary sex characteristics of the Rosy Barb to get information of biological reproduction in spawning of Rosy Barb.

2. Methodology

The observed dimorphism characteristics were meristic and body morphometric, while the observed dichromatic characteristics were the difference in the red coloration of the body and the width of the male and female fish tails.

3. Results & Discussion

The results of visual observations of male Rosy Barbs suggest that the males have a lighter red color and have a wider tail while the females which have a paler color to yellow and have smaller tails. The results of morphometric measurements showed several differences too, including slenderness. The male fish was leaner than females (the male fish 0.27±0.02 cm and the female fish 0.3±0.03 cm). The head size of the male fish is smaller than the female (male fish are 0.71±0.067 cm and female fish are 0.74±0.13 cm). The fins of the male Barbir are longer than the female (the male fish are 0.23±0.03 cm long and the female fish are 0.18±0.02 cm).

Table 2. Morphometric ratio of male and female Barbir

Morphometric Ratio	*Average (male)*	*Average (female)*
Slenderness	0,27±0,02	0,3±0,03
The Head Size	0,71±0,06	0,74±0,13
Body Size	1,4±0,33	1,71±0,1
Pectoral Fin Length	0,23±0,03	0,2±0,02

4. Conclusion

From the observations, there were significant differences in male Barbir and female Barbir in terms of color, body slenderness, head size and pectoral fin length.

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IoT BASED SMART GHAT WITH MOBILE ALERTING WARNING SYSTEM

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1. Introduction

Ghat refers to valley or deathly turns. Malaysia drivers use horn sounds as they are approaching ghat roads to indicate risky curves although signages are available. The problems arise as the signage is hard to see and horns are difficult to hear. Hence, the main intention of this study is to focus on assisting the drivers on the ghat road through the implementation of Internet of Things (IoT) and mobile alerting mechanism to offer warning signs.

2. Methodology

There are three phases involved in the research method to develop the project. Firstly, project initialisation which requires an observation and interview to gather information. This is followed by a project development phase that involves software, coding, assembling of the sensors and hardware, mobile alerting and cloud database. Then, the completed project was evaluated through functionality testing among the selected experienced users.

3. Results & Discussion

The development is equipped with proximity IR sensor to detect the vehicles presence and DHT11 sensor for temperature and humidity readings to detect dense fog on both road sections. The NodeMCU microcontroller will transmit data from the sensors to LED bulbs and smartphones via the Blynk application as a warning sign. The outcome of this project helps to assist vehicle drivers of the oncoming vehicle. Therefore, it will increase road safety and road accident instances would be reduced.
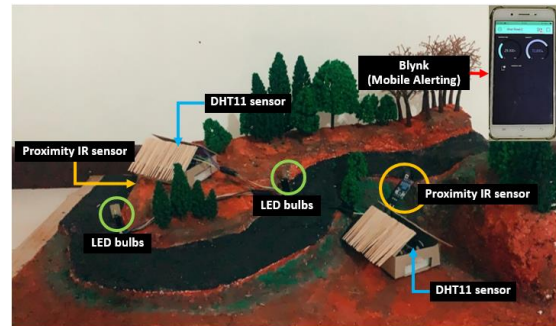
Figure 1. IoT based IoT based Smart Ghat with Mobile Alerting Warning System.

4. Conclusion

In conclusion, the usage of innovative systems will enable the driver to be more alert, reduce collisions and accidents and thus, improve driving efficiency and safety.

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INNOVATION COMPETITION JUDGING SYSTEM (ICJS V1.0)

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Keywords: Judging system, Web-based system, Laravel framework, MVC architecture.

1. Introduction

Innovation is a state of introducing something new or new ideas and methods to any changes made to pre-existing products or concepts. Many institutions have organized a number of innovation competitions to encourage the development of new products. The judging process in these innovation competitions is an important part as this process will determine the winner. Most of the time, the judging process will be conducted manually. Therefore, this study aims to improve the features of the current judging system so that it can assist the innovation competition organizers in managing the judging process effectively.

2. Methodology

The research for the system involved three phases. Firstly, the requirement identification which requires interview and observation from the current system to gather information. Next, the application development involves the system design and coding. Then, the completed prototype of the system was evaluated through functionality testing and Technology Acceptance Model (TAM) among the lecturers of UiTM Perlis Branch.

3. Results & Discussion

The evaluation result shows that the requirements are satisfied, and the majority of the users shows positive reaction towards the overall system operation. This system can help to ensure that the judging process will run smoothly and effectively. Besides, the process also can save time and reduce the use of paper during the evaluation process.
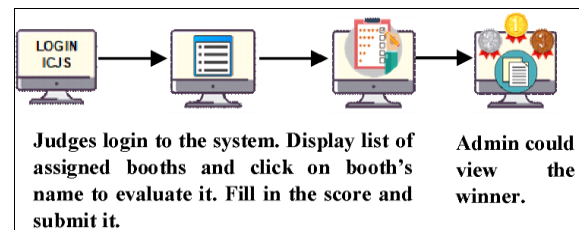
Figure 1. How System Works

4. Conclusion

The ICJS will fundamentally change the way the process of judging is done by managing all the data in a single central database. By using this system, the amount of work time used to achieve the set goal can be reduced.

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MASKED FACE DETECTION USING DEEP LEARNING APPROACH

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Keywords: Covid-19, Face mask, Facial detection.

1. Introduction

The COVID-19 coronavirus pandemic has impacted everyone on a global level. It stifled the global economy's growth [1]. To prevent the virus from spreading, the World Health Organization (WHO) has demanded people to wear face masks. It is critical to implement an automated facemask detection system to provide individual security while also preventing a local epidemic [2]. This project describes how facial detection can be used as a better method to detect face masks automatically. It makes the system's boundaries clear and can identify every person's face with a mask that synced with a universal system time.

2. Methodology

Data collection, training, and face detection were the three key components of this study. Image data of a human face with 4000 total samples mask and unmask was collected. All the samples were trained then executed face detection process so the system can detect mask and unmask face. The system is built with OpenCV, Keras/TensorFlow using deep learning models.

3. Results & Discussion

Figure 1 (a) and (b) show the result of mask and unmask detection with the confusion matrix. It shows that this model is very convenient to be used in the system.
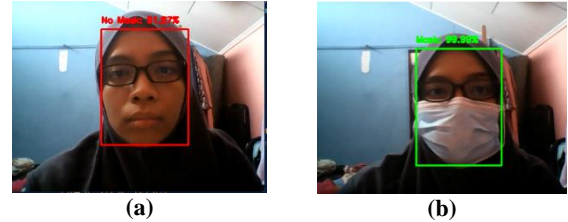
Figure 1. (a) Unmask (b) Mask

Table 1. Confusion Matrix

	Precision	Recall	F1-score	Support
Mask	0.99	1.00	0.99	433
Unmask	0.99	0.99	0.99	386
Accuracy			0.99	819
Macro Avg	0.99	0.99	0.99	819
Weighted Avg	0.99	0.99	0.99	819

4. Conclusion

The development of a large dataset of masked and unmasked faces led to an effective facial detection system that met the system's target accuracy.

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DEVELOPMENT OF SOAP FROM CRUDE EXTRACT OF *Pelargonium radula* WITH CITRONELLA OIL

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1. Introduction

The extraction of *P. radula* and citronella oil were used to develop antibacterial soap due to their antioxidant, antiseptic and bactericidal properties [1].

2. Methodology

2.1. Extraction of *P. radula* plant

The *P. Radula* plant was extracted using Soxhlet apparatus and 95% methanol as solvent. The percentage of crude extract in the sample was calculated.

2.2 Formation of soap

Soap samples were formed with different ratios of *Pelargonium radula* to citronella oil.

Table 1. Ratio and volume of *Pelargonium radula* to citronella oil

Ratio of *Pelargonium radula*: citronella oil	Volume of *Pelargonium radula*: citronella oil
30:70	3 ml: 7 ml
50:50	5 ml: 5 ml
70:30	7 ml: 3 ml

2.3 Physical-chemical evaluation test

Several types of evaluation were tested on the soap samples such as pH testing, % total fatty matter, % moisture content, and foam ability test.

2.4 Antibacterial activity

P. aeruginosa and *S. aureus* used to test antibacterial activity.

3. Results & Discussion

3.1 Percentage yield of *P. Radula* extract

The percentage yield obtained was 14.70%.

3.2 Physical evaluation of soap samples

Table 2. Result physical evaluation test on soap

Soap sample	pH	Moisture (%)	TFM (%)	Foam height (cm)
1	9.35	11.6	70.99	18.0
2	10.50	14.0	74.8	20.0
3	10.77	14.4	81.4	21.5

3.3 Antibacterial activity of soap sample

3.3.1 Soap sample against *S. aureus* and *P. aeruginosa*

Soap samples with ratios 30:70 and 50:50 showed a positive result on the inhibition zone against *S. aureus* and *P. aeruginosa,* in contrast with 70:30 soap samples.

3.3.2 Extract mixture against *S. aureus* and *P. aeruginosa*

The mixture with a ratio of 30:70 showed the highest inhibition zone against *S. aureus* and *P. aeruginosa,* with diameters of 28 mm and 23 mm, respectively.

4. Conclusion

In conclusion, soap from crude extract of *Pelargonium radula* with citronella oil can be used as antibacterial soap since they showed a positive result.

Acknowledgments

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IMPROVING THE PERFORMANCE OF MODELING THE AGARWOOD OIL BASED ON PRINCIPAL COMPONENT ANALYSIS (PCA) AND THE INTELLIGENT OF ANN CLASSIFICATION

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Keywords: PCA, ANN, Training algorithms, Performance measurements.

1. Introduction

Agarwood oil is known as the most precious essential oil which comes from the plant family Thymelaeaceae. Manually, the grading of agarwood oil is based on the human's sensory panel but this technique is inefficient and time consuming. This research proposed Artificial Neural Network (ANN) to grade agarwood oil into high and low quality. The dataset was taken from a previous researcher using PCA technique [1]. The three training algorithms; SCG, LM and RBP were used as classifiers to classify compounds into high and low quality. Finally, the model goes through a process of performance checks using confusion matrix, number of epochs and mean square error (MSE) value in order to accept the model.

2. Methodology

The significant compounds of agarwood oil from PCA [1] were fed into ANN for classification process using *patternnet* function. The hidden neuron was varied from 1 to 10 neurons.

3. Results & Discussion

Table 1. Final Design Parameter of ANN

Parameters	Value
Input neuron	3
Hidden neuron	2
Output neuron	1
Training algorithm	Levenberg Marquardt
Epochs	37
MSE value	1.76x10-10

4. Conclusion

LM algorithm was chosen as the best algorithm to grade agarwood oil.

Acknowledgments

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A NOVEL INTEGRATED APPROACH FOR CONTROLLING GLYPHOSATE-RESISTANT GOOSEGRASS (*Eleusine indica*) BIOTYPE

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Keywords: *Bipolaris bicolor*, Ametryn, Synergistic.

1. Introduction

Goosegrass is one of the world's five most problematic weeds, affecting the productivity of 46 crop species in over 60 countries [2]. It has evolved resistance to various groups of herbicides including glyphosate [1] due to excessive use of the same herbicides. This study aims to examine the potential of fungal pathogen, *Bipolaris bicolor* combined with ametryn for goosegrass control.

2. Methodology

Bipolaris bicolor was isolated from diseased goosegrass plants. Seedlings of glyphosate-resistant biotypes of goosegrass were sprayed with 0.8% Tween 80 + 10% oil solution (negative control), *B. bicolor* spore suspension at 1.7×10^8 spores/mL, ametryn at 1/15 labelled rate or a combination of the spore suspension and ametryn. One week after treatments, the shoot dry weight of goosegrass seedlings was determined.

3. Results & Discussion
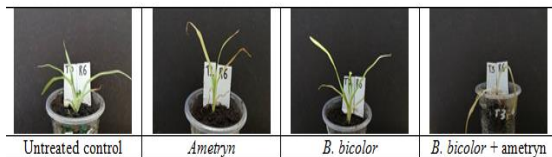
Figure 1: Response of goosegrass seedlings 5 days after treatment

Table 1. Shoot dry weight reduction of goosegrass seedlings at 7 days after treatment

Treatment	Shoot dry weight reduction (%)
Ametryn	49±6 b*
Bipolaris bicolor	30±6 c
Ametryn + *B. bicolor*	87±13 a

*Different letters indicate significant differences at p≤ 0.05

4. Conclusion

An integrated approach combining herbicide and fungal pathogen gave synergistic action against goosegrass seedlings. Future research is needed to see whether the combination of ametryn and *B. bicolor* could control mature goosegrass in the field.

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NICKEL OXIDE NANOPARTICLE: INNOVATIVE APPROACH TO ENHANCE THE PERFORMANCE OF PROTON CERAMIC FUEL CELL

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Keywords: NiO nanoparticles, Composite anode, PCFC.

1. Introduction
Nickel oxide (NiO) with coarse particles is widely used as an excellent electrode for proton ceramic fuel cells (PCFC) due to its natural porosity. As the particle is larger than proton ceramic materials, it will shorten the surface area and subsequently reduce the number of active sites. Hence, in this study, an innovative approach to reduce the NiO particles from micro to nano size was introduced.

2. Methodology
NiO Nps is synthesized by a modified sol-gel method and the pH value of the solutions are varied to pH 1, 7 and 11. The solution undergoes low heating treatment and calcined at 450°C and grinded to obtain NiO Nps powder. The NiO Nps powder is then characterized using FESEM, BET and XRD.

3. Results & Discussion
Single phase of NiO is obtained at pH = 1 as shown in Figure 1. However, a secondary phase of nickel (Ni) is detected at peak $2\Theta = 44.6°$ and $52°$ for solution with pH=7 and pH=11, respectively.
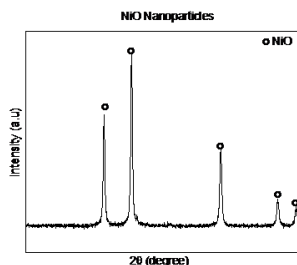
Figure 1. XRD Pattern of NiO Nanoparticles at pH=1

4. Conclusion
The best pH value to synthesize NiO Nps is pH= 1 and it can be used in composite anode to enhance the performance of PCFC.

Acknowledgments

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VISION BASED RECYCLE WASTE DETECTION FOR REVERSE VENDING MACHINE USING YOLO BASED FRAMEWORK

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Keywords: RVM, YOLO, Object detection, Recycle waste.

1. Introduction

Reverse Vending Machine (RVM) is an interactive recycling platform that can identify the deposit recycle items before providing a reward to the user [1]. In this project, a vision-based recycle waste detection system is proposed to detect three types of recyclable material which are aluminum can, PET bottle and Tetra Pak, using You Only Look Once (YOLO)V5 framework [2] for the RVM usage.

2. Methodology

Sample images of the three recycle items consisting of 7409 samples are self-collected and fed to the YOLO V5 framework. Hyper parameters are then rigorously tuned until the model achieves 0.995 mAP@0.5 accuracy. Eventually the optimal YOLO model was tested with a live feed webcam to analyze the real time detection performance.

3. Results & Discussion

In this section, a live feed module assessment is being tested under several conditions and the outcome is depicted in Table 1. It shows that the module is able to accurately detect the recycled items except in low illumination the accuracy only achieved 22%. Sample of the detection process is shown in Figure 1.

4. Conclusion

After the module has undergone various assessments under different conditions, it can be concluded that the accuracy obtained is 97.5% with good illumination. In future, the performance can be improved by training the module with more sample sets.

Table 1. Result after the module has been tested under several conditions

Condition	Accuracy, %
Sequence 10 Class	90
Random Class	100
Moving Camera	100
Illumination	100

Figure 1. Sample result of the detection process for PET bottles, aluminum Can and Tetra Pak.

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DESPlus: NEW INSIGHT ON PLASTIC PACKAGING

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Keywords: Bioplastic, Plasticizer, Crosslinker, DES, Citric acid.

1. Introduction

Recently, it was estimated that 46% of total plastic waste generated came from the packaging sector [1]. This is because most commercial plastics are single-use and persist in the environment [2]. Bioplastic is a suitable biodegradable alternative to synthetic plastic. By adding additives such as plasticizer and crosslinker in bioplastic production, its mechanical properties can be enhanced yet retaining its plastic properties. Hence, this study incorporates deep eutectic solvent (DES) as a plasticizer due to its biodegradability and citric acid as a crosslinker to enhance the mechanical properties of bioplastic production from citrus pectin.

2. Methodology

The bioplastic samples were prepared in the ratio of 3:1:1 for pectin, DES, and citric acid, respectively. No citric acid was added for the control. A tensile test was done to compare the strain, stress, and Young's Modulus for both bioplastic samples.

3. Results & Discussion

The bioplastic samples produced can be observed in Figure 1. The appearance of the sample is transparent/opaque. Figure 2 shows the stress-strain curve for control and 1% citric acid bioplastic. It is shown that the sample with 1% citric acid has higher strain and stress compared to the control group, showing some improvement in the tensile properties.

Figure 1. Bioplastic sample
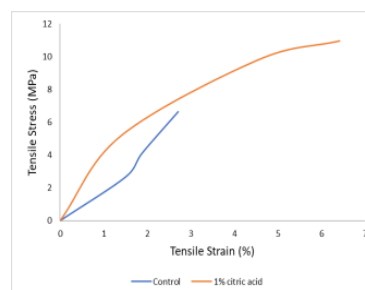
Figure 2. Stress-strain curve of control and 1% citric acid bioplastic

4. Conclusion

Citric acid as crosslinkers enhanced the mechanical properties of bioplastics.

Acknowledgments

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HIGH CONDUCTIVITY OF POLYLACTIC ACID (PLA) BASED POLYMER ELECTROLYTE

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Keywords: Polylactic acid, Polymer electrolyte.

1. Introduction
Polylactic acid (PLA) has the potential to be a material for polymer electrolytes (PE) utilized in storage devices as sustainable, safe, and environmentally acceptable energy resources are currently in high demand. The most important parameters for use in an energy storage device are strong ionic conductivity, and the current study discovered that the ionic conductivity of PE ranges from 10^{-8} to 10^{-3} Scm^{-1} [1]. The goal of these works is to fabricate the high conductivity of polylactic acid-based polymer electrolyte (PLA-PE).

Where Rb is the bulk resistance, l is the thickness of the film, and A is the area of the

2. Methodology
High ionic conductivity PLA-PE was prepared by using solution casting method. The PLA was doped with 50 percent of lithium perchlorate (LiClO4) and 300 percent of propylene carbonate (PC). Polymer electrolyte (PE) film were measured at room temperature 27 °C using an Agilent 4284a Precision LCR meter frequency range of 0.1 Hz to 100 MHz. The reading data were analyzed by using the Zive Smart Manager Software Version 6.54.

3. Results & Discussion
Figure 1 show the Cole-cole plot of PLA-LiClO4-PC polymer electrolyte system. The value of the ionic conductivity was determined using equation 1.

$$\sigma = \frac{l}{R_b A} \quad (1)$$

sample [1]. At room temperature, the conductivity is 1.14×10^{-2} Sm^{-1}. The high conductivity of PLA-PE is achieved as a result of the optimal amount of dopant LiClO4 as the ionic ion in the PLA and PC as the plasticizer aids in the enhancement of ion interactions and the maximization of ion mobility.
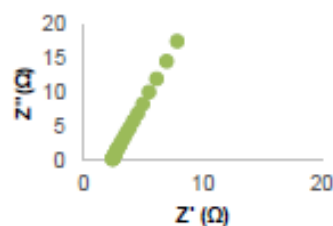
Figure 1. Cole- cole plot of PLA-PE

4. Conclusion
The high conductivity PLA-PE has the conductivity value 1.14×10^{-2} Sm^{-1}.

Acknowledgments

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LOW RPM PERMANENT MAGNET GENERATOR FOR SIMPLE PICO-HYDROPOWER IN REMOTE AREAS

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Keywords: Permanent magnet, Electrical generator, Pico-hydropower.

1. Introduction

Small hydropower stations can benefit from permanent magnet generators. One issue with using a permanent magnet generator to create power is the inability to achieve a high torque with low water content. However, one approach for solving this problem is to twist the magnetic bar placement angle in order to create a rotational force with less water volume, which may be utilized to invent themselves due to the low cost of manufacture [1]. As such, this work aimed to develop innovations for simple hydroelectric power generation for communities in remote areas.

2. Methodology

A generator is a device that converts rotational energy from a water turbine into electrical energy. The AC generator comprised two parts: a stator and a rotor [2]. The stator was made up from 320 turns of SWG20 coil wire, while the rotor consisted of 12 poles of permanent magnets. The generator produced an AC output, which was coupled to a bridge rectifier and converted the AC output into a DC output.

3. Results & Discussion

From the experimental test, the magnet 15° was twisted in order to create a rotating force with a small water volume. This was established when the rotational speed increased, and the power also increased. As shown in Figure 1, the electric generator has the ability to increase its ranges from 100 rpm with a 150.0 W power output to 500 rpm with a 252.6 W power output.
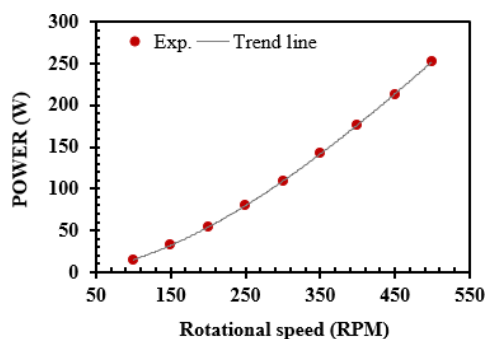
Figure 1. Relationship between generated power and rotational speed.

4. Conclusion

The permanent magnet generator had a maximum output of 252.6 W at 500 rpm; therefore, it would be appropriate for usage in places with limited water resources.

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THE DEVELOPMENT OF A COMPOSITE CATHODE FOR INTERMEDIATE TEMPERATURE SOLID OXIDE FUEL CELLS

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Keywords: Solid oxide fuel cell, Composite cathode, Microstructural, Impedance spectroscopy.

1. Introduction

The act of decreasing the operating temperatures of solid oxide fuel cells (SOFC) benefits the quicker start-up/shut-down and will make SOFC commercialization more feasible. Unfortunately, the performance degrades with the decreasing of operating temperature due to higher polarization resistances caused by electrochemical processes on the electrodes and reduced electrolyte conductivity [1]. Therefore, it is critical to develop a cathode with high performance operating capabilities in the intermediate temperature range.

2. Methodology

$SrFe_{0.9}Ti_{0.1}O_{3-\delta}$ (SF_9T_1) was produced by the glycine-nitrate combustion (GNC) process [2]. SF_9T_1 and $Ce_{0.8}Sm_{0.2}O_{1.9}$ (SDC) were mixed via high energy ball milling. The cross-section image was captured using a scanning electron microscope (SEM). Electrochemical impedance was measured with the potentiostat, and the analysis was fitted by using NOVA 1.0 then plotted with OriginLab 2019b version.

3. Results & Discussion

ASR values of 0.12 Ωcm^2 at 800 °C and 1.20 Ωcm^2 at 600 °C (sintered at 1200 °C) were obtained. This is consistent with the particle size effect on composite cathode performance. SF_9T_1-SDC has successfully improved percolation, reduced phase agglomeration and increased the effective triple-phase boundary length. Delamination of the electrolyte's cathode was avoided because of the enhanced adhesion between the composite cathode and electrolyte.
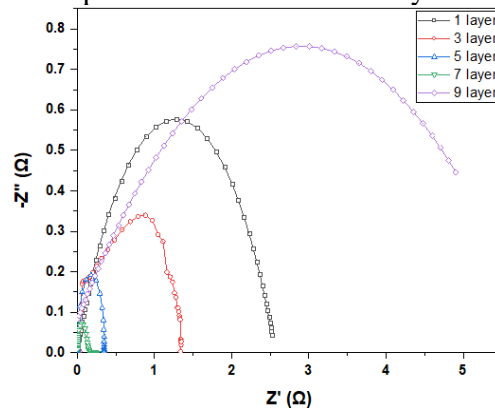
Figure 1. Impedance spectrum of SF_9T_1-SDC symmetrical cell
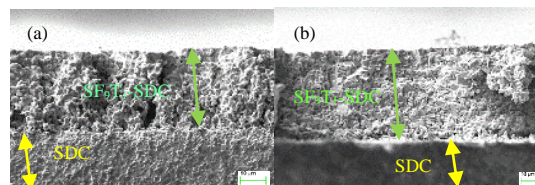
Figure 2. Cross-sectional micrograph for (a) 7-layers and (b) 9-layers symmetrical cell SF_9T_1-SDC

4. Conclusion

SF_9T_1-SDC composite cathode has a high potential as a novel material for cathode intermediate temperature SOFC.

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ACOU@PLAY: IDENTIFY DENTAL ANXIETY AND PREFERENCES MUSIC

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Keywords: Acoustic, Anxiety, Gagging reflex, Music, Smartphone app.

1. Introduction

Dental anxiety is common and a term to describe a fear of dentists, dental procedures and instruments or clinical settings. People with anxiety tend to focus on the negative aspects of a situation and have an increase in the impact of sights, sounds, and sensations [1, 2]. Dental anxiety may cause a gag reflex, an involuntary contraction of muscles of the soft palate or pharynx that proceed in retching [1, 3]. It is confirmed that people with dental anxiety have poor oral health and habits which lead to avoidance behaviours, delay and lack of regular dental care. Recent studies provide a clear view of how music interventions may reduce stress and increase well-being [2, 3].

2. Methodology

ACOU@PLAY was developed and integrated music in managing patients with dental anxiety to ease short and simple procedures. The information regarding the app contents and interfaces are shown in Figure 1.

Figure 1. ACOU@PLAY contents and interfaces

3. Results & Discussion

Let's IdentifyYou, is a section in determining the severity of a patient's anxiety and gag reflex level. All assessments that are built-in to this app are able to category the patients.

Let's Listen, is a section where patients choose the songs based on their music preferences and listen to them during dental treatment.

4. Conclusion

The novelty of this ACOU@PLAY apps as an auditory tranquilizer especially in a clinical setting that may lead to an increase of dental treatment efficacy. Regardless, ACOU@PLAY will be beneficial to other patients in giving comfort and calmness throughout dental treatment.

Acknowledgments

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UTILIZATION OF EMPTY FRUIT BUNCH (EFB) TO PREPARE HYDROXYPROPYL METHYLCELLULOSE (HPMC) AS POTENTIAL PLANT-BASED MEDICINE CAPSULE

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Keywords:Cellulose, Capsule Medicine, Empty fruit bunch (EFB), Hydroxypropyl methylcellulose (HPMC).

1. Introduction

Elaeis guineensis (palm oil tree) was used to produce edible oil. The manufacturing process had left waste such as empty fruit bunches (EFB). The lignocellulose material from EFB can be extracted to obtain the cellulose and further utilized to make hydroxypropyl methylcellulose (HPMC) as a potential plant-based medicine capsule.

2. Methodology
2.1. Cellulose Extraction and Synthesized HPMC

The extractions of cellulose were done using alkali and bleaching treatment. Dimethyl sulfate and propylene oxide are the main chemicals used to synthesize HPMC from treated cellulose. Treated cellulose and synthesized HPMC were weighed to calculate respective yield.

2.2. Analysis of Fourier Transform Infrared (FTIR)

FTIR spectroscopy was used to analyse the functional group of raw, treated EFB and also synthesized HPMC.

3. Results & Discussion

Cellulose yield in alkali and bleach treatment were 62.51% and 61.49%, respectively. The reduction in yield for bleach treatment indicates further removal of lignin and hemicellulose. Meanwhile, synthesized HPMC yield was 174.14% due to the change of cellulose structure. Figure 1 shows the FTIR result for all samples.
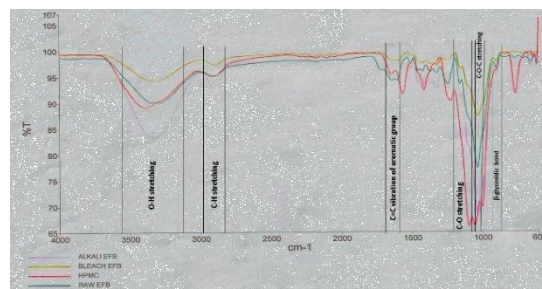
Figure 1. FTIR spectrum of raw EFB, treated cellulose and synthesized HPMC

4. Conclusion

EFB contains high yield cellulose and this cellulose can be further used to synthesize HPMC.

Acknowledgments

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PREDICTORS OF QUALITY OF LIFE AMONG ELDERLY IN 11TH REGIONAL HEALTH, THAILAND

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Keywords: Elderly, Quality of life, WHOQOL – BREF –THAI.

1. Introduction
A decrease in birth fertility and an increased life expectancy lead to elderly population [1]. The study of quality of life (QoL) of elderly is important. This study aimed to investigate the relationship between QoL and demographic-social factors.

2. Methodology
Secondary data based on a cross-sectional study were used. The data were collected from 400 (166 male and 234 female) elderly people of the 11th regional health in 2018. The WHOQOL-BREF-THAI was utilized to measure the QoL. The demographic-social factors were also collected. Cronbach's alpha and multiple linear regression were used to analyze the data.

3. Results & Discussion
A total of 46% of elderly were between ages 70-79. 99% were married and 90% were educated to primary school. About 75% were retailers and 50% had income from business. 90% were living with spouses and 80% used government hospitals for health care service.
Cronbach's alpha was 0.32, 0.65, 0.35, and 0.35, respectively, for the physical, psychological, social, and environment domains, and 0.78 for the total scale. The descriptive statistics of domain scores were shown in Table 1.

Table 1. Descriptive statistics for QoL domains

Domains	Mea	S.D	Skewness	Kurtosis
Physical	19.18	2.06	-0.06	-0.43
Psychological	15.61	2.47	0.43	0.40
Social	9.39	1.63	-0.05	0.20
Environment	25.15	3.16	-0.70	0.70

The multiple linear regression revealed that gender (female) and age (70-79, >80) were predictors for two domains but divorced, education and private hospital were predictors for the only domain. However, occupation (retailer) and income (business) were predictors for four domains.

Table 2. Multiple regression of QoL and its predictors

Variables	PHY	PSY	SOC	ENV
Constant	20.03	16.70	10.04	17.12
Gender (Female)	-	-1.73	-1.30	-
Age				
70-79	-0.77	-	-	-0.73
> 80	-1.35	-	1.13	-
Marital Status (Divorced)	-4.30	-	-	-
Education				
Primary School	-	-	-	6.47
Junior High School	-	-	-	5.44
Bachelor degree	-	-	-	10.39
Other	-	-	-	13.25
Occupation (Retailor)	-1.28	-1.15	-0.85	1.47
Income (Business)	1.35	1.18	1.17	1.46
Hospital (Private)	-	1.10	-	-
R^2	**0.29**	**0.26**	**0.21**	**0.44**

Base Variable = Male, Age 60-69, Single, No education, Agriculture, Subsistence allowance, Sub-district hospital. PHY =physical, PSY= psychological, SOC=social, ENV=environment.

4. Conclusion
Occupation and income are still important factors to QoL in all domains [2]. Thus, relevant agencies should encourage the QoL of elderly.

Acknowledgments

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SEE THROUGH WOOD

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Keywords: Transparent wood, Red meranti, Optical transmission.

1. Introduction

The idea is a see through or transparent wood (TW) lay in the lignin removal and replacement of voids with suitable resin via infusion. TW which combines optical and mechanical performance is an emerging new material suitable for light-transmitting structures in buildings with the aim of reducing energy consumption [1]. This is because wood has low thermal conductivity which would help to keep a building at a more consistent temperature and thus make it easier to reach higher energy efficiency [2].

2. Methodology

Delignification process was done in boiling solution of NaOH and Na_2SO_3 for 3, 6, 9 and 12 h followed by peroxide removal. Samples were then impregnated with epoxy resin, cured and tested for optical transmission.

3. Results & Discussion

Figure 1. Lignin Content and Transmission

As in Figure 1 the optical properties showed improved transmission with increasing time. The lignin removal was proportionally related to time of boiling but gave an up curve after 9h. This is the limit of dissolution and reabsorption for the test condition.

4. Conclusion

Red meranti (*Shorea* spp.) which had undergone three hours showed 35% transmission. The incorporation of wood with suitable resin and correct processing will create a TW.

Acknowledgments

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ETOS: EDUCATION TECHNOLOGY IN ONLINE SYSTEM AS LEARNING APPLICATION INNOVATION

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Keywords: Education, New normal, Learning application, ETOS.

1. Introduction

The Indonesian Minister of Education and Culture has established online learning during the COVID-19 pandemic. One of the main challenges students face during schooling from home are lack of teacher guidance [1]. Due to this, our innovation is The Education Technology in Online System (ETOS). ETOS helps students who have difficulty in learning independently through various creative learning innovations. In addition, this application makes it easier for teachers to conduct online learning and provide assessments that are integrated with the school's assessment system.

2. Methodology

The method is as follows: literature study, problem identification, determining features and menu, application design, and survey related public response for ETOS.

3. Results & Discussion

The public gave positive responses to the implementation of the ETOS application as an alternative to online learning during the COVID-19 pandemic. Based on 207 sample respondents, 64% were interested in the ETOS application as a medium to support online teaching and learning and as many as 66% stated that the ETOS application can support online teaching and learning activities. The features contained in the ETOS application are presented in Figure 1.

Figure 1. ETOS User Interface

ETOS displays special features that differentiate it from the other online based learning applications. This application is designed to connect student's grade history with the school grading system, conduct face-to-face online learning by using conference features, divide students randomly into several groups, give daily learning reminders by displaying notifications on the students' smartphones, and set the time of assignments and exams.

4. Conclusion

ETOS provides solutions related to learning innovation through applications as a form of excellent service for students, in order to achieve the SDGs targets related to quality education.

Acknowledgments

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INSURANCE CONSULTANT (InsTant): AN ANDROID-BASED APPLICATION TO INCREASE PUBLIC KNOWLEDGE ABOUT INSURANCE IN INDONESIA

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Keywords: Innovation application, Insurance consultant, InsTant, Insurance.

1. Introduction

The COVID-19 pandemic has resulted in severe economic impact. With this, Indonesians' awareness of life insurance has increased by 24% [1]. Yet, they still need to be educated on which and what insurance program is suitable according to their income and needs. Therefore, an Android-based insurance consulting application innovation is needed to fill these needs and solve the problems. The application is called Insurance Consultant (InsTant).

2. Methodology

This project starts by conducting a literature study and continues by identifying existing problems. Based on these problems, InsTant is made as an innovation. Then, a survey was carried out and showed the public interest in InsTant applications.

3. Results & Discussion

InsTant main feature is InsTalk. This feature provides insurance consultation between users and credible consultant insurances. In addition, InsTant also has 3 other side features. There are InsCalc which is useful or calculating insurance premiums, InsLink a feature that connects user data with suitable insurance programs, and InsIght which provides various articles and news about insurance. A survey of public interest in InsTant application concludes that 63.3%

of 120 respondents stated that respondents are very interested in this innovative InsTant application.
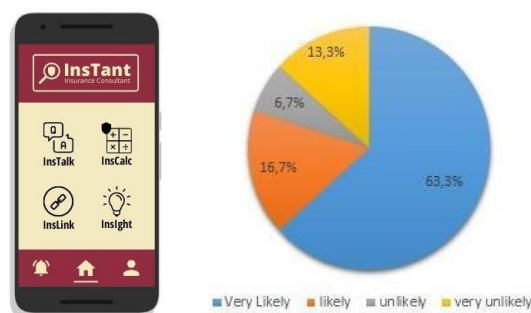
Figure 1. User Interface of InsTant Application and Survey of Public Interest in InsTant Application

4. Conclusion

The InsTant application is a breakthrough in innovation and technology innovation that increases public knowledge about insurance and which is suitable for each consumer.

Acknowledgments

We would like to express sincere gratitude to all who have contributed to this project.

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"Pay-US" APPLICATION BASED ON ANDROID FOR MARKETING OF PROCESSED ELOPS HAWAIIENSIS PRODUCT AS A POTENTIAL OF LEADING VILLAGE NEAR SURABAYA

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1. Introduction

Kepetingan Village is located 14 km from Surabaya and 7.6 km from the Juanda International Airport. This village has poor road access. However, this village has biodiversity properties which is a local potential, named Elops Hawaiiensis [1]. Elops Hawaiiensis has high protein and low calories [2] so Kepetingan villagers process it into several products, one of them is chips. The marketing of this product has not been maximized because there are still many people who do not know this village and its product, so innovation is needed. The innovation of the "Pay-US" application as a form of technology utilization aims to optimize the marketing of this product throughout Indonesia in the hope of increasing product sales and improving the economy of the surrounding community.

2. Methodology
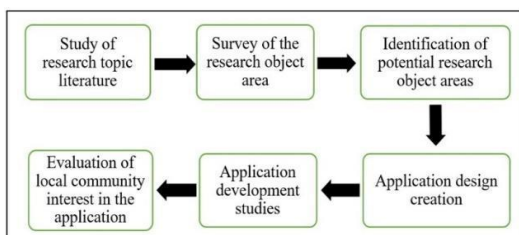
Figure 1. Research and Activity flowchart

3. Results & Discussion

The Pay-US application received a positive response from 157 respondents as shown in Figure 1. The main features of the "Pay-US" application are also shown in Figure 1 below. *Payus Fish* and *Product of Payus Fish* displays information about *Elops Hawaiiensis* and the price of its processed

product so that the users can order it. Moreover, there are also *Another Product* and *Kepetingan Village* features which have information about other processed products and this village. In addition, there is a Scan feature which is useful for purchase transactions.
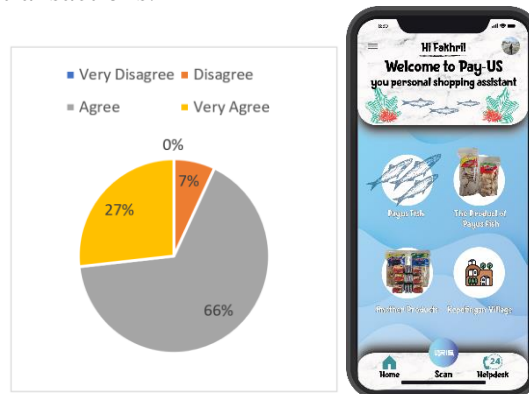
Figure 2. Public Response of "Pay-US" Application and Features of "Pay-US" Application

4. Conclusion

Optimizing the "Pay-US" application as a technological innovation and marketing requires collaboration with the government to facilitate the server maintenance and promotion.

Acknowledgments

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IRIS (ISLAMIC TOURISM) APPLICATION AS CONTRIBUTION IN DEVELOPING INDONESIAN ECONOMIC TO INCREASE PUBLIC INTEREST IN HALAL TOURISM

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1. Introduction

The development of a potential halal tourism hub will be one of the contributors to Indonesia's future economic growth. The development of the tourism industry is one of the steps taken to support the 4.0 industrial revolution by focusing on the use of technology.

Two main points hindering the development of halal tourism in Indonesia, namely public perception and halal certification [1]. The Iris (Islamic Tourism) application is a technological based innovation. It is envisioned as a platform for halal tourism which will develop and support halal tourism in Indonesia. It can be accessed online by tourists and develops the future potential of the halal tourism in Indonesia.

2. Methodology
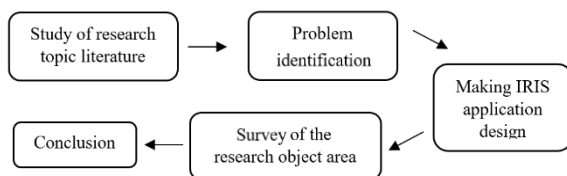
Figure 1. Research Methodology Process

3. Results & Discussion

Based on a survey of 100 respondents, it shows that 33% respondents are very interested and 57% are interested in using the Iris application for halal tourism. Survey respondents are more comfortable using the Iris application as it has complete features, thus, making it easier for halal tourists to be more comfortable visiting Indonesia. Iris has information on health facilities, hotel services, travel agencies, and restaurant dishes that are sharia compliant. The display of the Iris application is presented in Figure 2.

Figure 2. Display of Iris Application

4. Conclusion

Iris application is promoted to increase public literature on halal tourism so that tourists will feel more comfortable visiting and travelling in Indonesia because it guides tourists and travellers to halal places which are in accordance with the sharia principles.

Acknowledgments

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MANUFACTURING PROCESS ABNORMAL SIGNAL(S) ANALYSER

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Keywords: Manufacturing, Abnormality, Root cause analysis.

1. Introduction

To ensure the stability of a manufacturing process, statistical process control (SPC) is often employed to measure and control the process. Total conditional variance (TCV) is a multivariate variability measure in SPC which measures the process and identifies the abnormal signals in the process while determining the factors contributing to the abnormality [1]. Thus, TCV is a great measure to conduct root cause analysis on the abnormal signals of a manufacturing process. Despite the powerful usage of TCV, it is not widely promoted in industries due to the complexity of calculation of multivariate variability measure [2]. This research developed the first computer program that conducts SPC using TCV as the measure to overcome the challenges of manual calculation of TCV, which is the Manufacturing Process Abnormal Signal(s) Analyser.

2. Methodology

The existing algorithm of TCV is modified into an encodable algorithm. The encodable algorithm is converted into a computer program in Python.

3. Results & Discussion

The analyser accepts a data set which has a sample size greater than 30 as an input, and produces the TCV SPC chart, the list of abnormal signals detected, and the indication of the major contributing factor of each of the abnormal signals, as outputs. The efficiency and accuracy of the analyser is examined during the simulation analysis using a simulated data set with pre-set abnormal subgroups with a pre-set major contributing factor of abnormality. The analyser has successfully identified the abnormal subgroups and each of their major contributing factors at 100% accuracy. Therefore, it is an efficient and reliable root cause analysis tool for the manufacturing industry.

4. Conclusion

The analyser could elevate the product quality in the manufacturing industry since it eases the quality control process by generating the SPC chart results while indicating the abnormal signals and sources of abnormality efficiently. Improved efficiency of the quality control process and reduced cost to eliminate the sources of abnormality would enhance the stability of a manufacturing process, hence improving the product quality of the manufacturing industry.

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UTILIZATION OF SNAIL MUCUS AS AN ALTERNATIVE NON- ALCOHOLIC HAND SANITIZER LIPUTAN (*LENDIR SIPUT* HAND SANITIZER)

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1. Introduction

Hand sanitizer is a hand cleanser that has antibacterial ability to inhibit and kill bacteria. Most hand sanitizers contain alcohol which is widely used as an antiseptic for disinfecting clean skin surfaces, but not for injured skin. However, alcohol has irritating properties on the skin, and also increases viral infections that trigger inflammation of the digestive tract. Thus, alternative ideas for hand sanitizer products without alcohol are needed. So, the alternative hand sanitizer product that our team offers is made from snail mucus (*Achatina fulica*) with the combination of betel leaf. There are three components that can repair skin cell tissue, namely fibrinolytic enzyme, glycolic acid, and antimicrobial in snail mucus and betel leaf [1]. This is the advantage of our innovative products compared to other hand sanitizers. This innovation is called LIPUTAN (*Lendir Siput* Hand Sanitizer).

2. Methodology

The methods related to LIPUTAN in sequence are; collecting facts and information, problem identification, market analysis, survey, product and cost analysis, production, marketing and sales.

3. Results & Discussion

LIPUTAN is the main product in the form of alternative hand sanitizer ready for sale and it has positive response from consumers according to the data below.
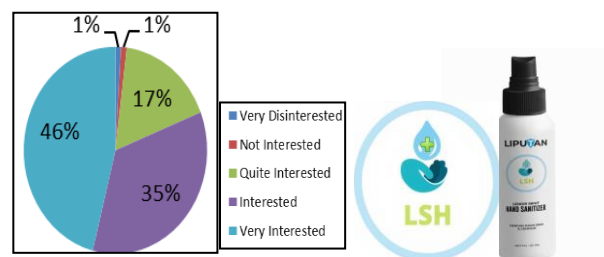
Figure 1. From Left to Right are Customer Responds, Logo Product, and the Example of the Product

LIPUTAN can be obtained through Instagram (@lsh.liputan) and website (http://www.lendirsiputhandsanitizer.blogspot.com). For only IDR 13.000/bottle of 60ml size, the business potential of this product can be promising and feasible to be developed.

4. Conclusion

LIPUTAN (*Lendir Siput* Hand Sanitizer) is a hand sanitizer made from snail mucus with the combination of betel leaf. LIPUTAN contains ingredients such as fibrinolytic enzyme, glycolic acid, and antimicrobial. This content can protect the skin from damage, infection, dryness and UV rays. Thus, LIPUTAN has more advantages compared to other similar products. Its price is also affordable and gets a positive response from consumers.

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HEALO: HEAT-HEALABLE RUBBER TILE

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1. Introduction

Healo rubber tile was formulated mainly of microwave de-vulcanize EPDM waste. Microwave devulcanization destroyed the three-dimensional network of EPDM waste rubber [1]. The destroyed network allows rubbers to flow, remolded and mixed with new polymeric materials [2]. Hence, resulting in better self- healing performance as rubber chain diffusion ability increases as heat is introduced [3].

2. Methodology

2.1 Characterization, mechanical and self-healing properties of EPDM waste

Grind EPDM (G-EPDM) will be microwave de-vulcanize for 5 minutes at 450 watt (M-EPDM) before going through characterization testing of sol fraction, crosslink density and devulcanization percentage using Soxhlet Extraction method. Meanwhile, self-healing properties will be analysed for the EPDM waste/ natural rubber blends before and after self-healing.

3. Results & Discussion

In Table 1, M-EPDM shows a higher sol fraction (3.07%) but lower in crosslink density (0.99×10^{-5} mol. cm^{-3}) compared to G-EPDM. Hence, resulted in a devulcanization percentage of 35.71 %. M-EPDM also have a 47.0% of self-healing percentage capability resulting from lower tensile strength and elongation at break but higher in young modulus.

Table 1. Soxhlet Extraction Result

Sample	Sol Fraction (%)	Crosslink Density	Devulcanization (%)
G-EPDM	1.84	1.54	
M-EPDM	3.07	0.99	35.71

Table 2. Self-healing properties

Sample	Tensile Strength	Elongation at Break	Young Modulus
Before Healing	10.49	181.83	6.53
After Healing	4.93	89.11	8.04

4. Conclusion

Self-healing and efficient devulcanization process of rubber was successfully achieved.

Acknowledgments

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CUSTOMER SATISFACTION ANALYSIS USING QUALITY FUNCTION DEPLOYMENT ON MALAYSIAN DOMESTIC AIRLINES

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Keywords: Customer satisfaction, Quality function deployment, Service quality.

1. Introduction

In this age of globalization, airline service quality has become a popular issue in the global air transportation industry [1]. Due to the intensely competitive market situation, an airline company is required to focus on the passenger's satisfaction and expectations. Therefore, this study attempts to determine the customer satisfaction analysis by using quality function deployment on Malaysian domestic airlines which are AirAsia, Malaysia Airlines and Malindo Air.

2. Methodology

Quality function deployment is an effective management technique to provide a visual connective analysis that focuses on the customer's requirement throughout the total development cycle process. This technique is widely used to measure customer satisfaction of a product. However, it will be adopted to measure customers' satisfaction with the service quality by the integration of three different statistical methods. These are association analysis, text mining technique and the house of quality. The combination of these fundamental and statistical approaches can be beneficial to the measurement of intangible factors in the different service industries.

3. Results & Discussion

The findings of association analysis concluded that there is a significant association between the service attributes and customer recommendation in three Malaysian domestic airlines. The "Service" recorded the overall distribution of major words which most frequently appears in passenger's reviews by using text mining technique. While for the house of quality, the priority of the customer's requirements were closely related to value for money and the priority of technical requirements. These were derived based on their high relationship with the priority customer requirement that were concluded as "Functional, annual and international civil aviation organization training".

4. Conclusion

In this study, all of the service attributes play a vital role in customer satisfaction. It can be concluded that a significant association exists between the service attributes and customer recommendation in three different Malaysian domestic airlines.

Acknowledgments

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MONITORING THE WATER DENSITY THROUGH MODELLING OF SURFACE WATER SALINITY OVER SUNGAI MERBOK, KEDAH

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1. Introduction

The spatial interpolation methods have been recently used by many environmentalists to assess the environmental data [1]. This research is carried out to investigate the pattern of water salinity at Sungai Merbok, Kedah. The outcome of the research supports the 2030 agenda on the Sustainable Development Goal 14 (SDG14): Life below water.

2. Methodology

The development of the map utilized the Inverse Distance Weighted (IDW) interpolation methods. This invention used the Geostatistical analyst tool in the ArcMap software for the development of the model.

3. Results & Discussion

The model has been successfully developed using the IDW interpolation method. Statistical information based on the cross-validation processes is presented in Table 1.

4. Conclusion

The research has demonstrated the innovativeness of the product which could help agencies to construct strategic policies and monitoring plans.

Acknowledgments

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Table 1. The summary information on prediction errors

Variables	Data
Optimum Power	2.3784383608880106
Predicted Regression Function	0.803804657306779 * x + 5.13480812949103
Error Regression Function	-0.196195342693221 * x + 5.13480812949104
Mean Prediction Error	0.19754657393606992
Root Mean Square Prediction Errors	1.9674629474922356

MONITORING THE ECOSYSTEM HEALTH THROUGH MODELLING OF SURFACE WATER DISSOLVED OXYGEN OVER KUALA PERLIS, PERLIS

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1. Introduction

To date, there has been no information on the spatial and temporal variation of dissolved oxygen (DO) at Kuala Perlis for the assessment of ecosystem health.

2. Methodology

The spatial data of DO was developed by using the IDW methods as shown in Figure 1. Figure 2 shows the underlying relationship.
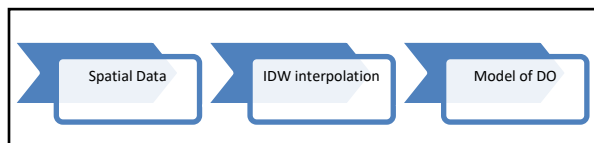
Figure 1. Methodology
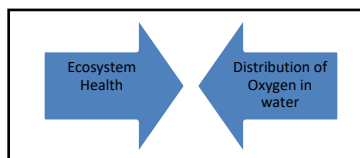
Figure 2. Relationship between ecosystem health by knowing the level of oxygen in the water.

3. Results & Discussion

The colder the water, the more oxygen the water can hold [1]. Oxygen generally becomes dissolved in surface waters because of diffusion from the atmosphere [2] and aquatic-plant photosynthesis [3]. In general, dissolved oxygen is consumed by the degradation of organic matter in water [4].

4. Conclusion

The avoidance of these dead zones in the study area can be made by implementing the system for an early detection. The developed map produced low error (RMSE 0.608).

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MONITORING THE WATER IMPURITIES THROUGH MODELLING OF TOTAL SUSPENDED SOLIDS FOR SUNGAI MERBOK, KEDAH AND KUALA PERLIS, PERLIS

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Keywords: Sungai Merbok, Kuala Perlis, Total suspended solids.

1. Introduction

This research is carried out to develop a system to monitor the surface water total suspended solids. The system will be tested at two locations namely Sungai Merbok, Kedah and Kuala Perlis, Perlis.

2. Methodology

Gravimetric analysis was used for the determination of TSS in samples of water. Development and validation of data were carried out using the ArcMap application. Figure 1 shows the methodology and testing system developed for both rivers.
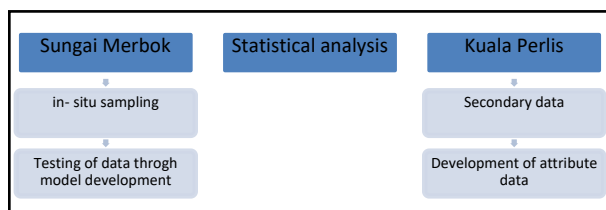
Figure 1. Methodology

3. Results & Discussion

The system determines that suspended solids for both locations are affected by anthropogenic activities. For Kuala Perlis, the majority of suspended solids are from plastics. Many pollutants can be attached to TSS, which is not good for the aquatic habitat and lives [1]. High suspended solids also prevent sunlight from penetrating water [2]. The presence of synthetic organic chemicals added bad tastes, odours and colours to fish and aquatic plants in the low amount [3].

4. Conclusion

The system produced a low error for Sungai Merbok (RMSE= 62.688) and for Kuala Perlis (RMSE= 162.167) in predicting TSS. The model can be used for monitoring systems for both rivers.

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MONITORING THE EFFECTS OF OCEAN ACIDIFICATION THROUGH MODELLING OF SURFACE pH OVER PULAU TUBA, KEDAH

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Keywords: Ocean, Acidification, pH, Pulau Tuba, Modelling.

1. Introduction
This research is carried out to investigate the pH pattern of surface water at Pulau Tuba, Kedah. Here, we proposed a system in the form of a spatial map for the early detection of ocean acidification processes.

2. Methodology
The sampling activities were done by lowering the pH meter to 1m. Development of the model was done using the spatial interpolation method of IDW. Figure 1 below shows the methodology for the experiment.
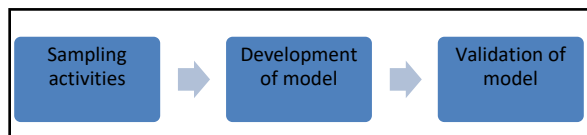
Figure 1. Development of model

3. Results & Discussion
The model has been developed successfully using the IDW interpolation method. Statistical information revealed that the mean prediction error and root mean prediction error were recorded at 0.041 and 0.668 respectively. The study also found that the pH level is affected by spatial-temporal variations.

As a concern, the aquatic organisms are affected if the pH of the water body is too high or too low [1]. The animal systems will be under stress while hatching rates and survival rates will significantly reduce if the pH levels move away from the favourable range [2]. As for the big impact on the environment, the unusual pH of the water can lead to ocean acidification [3]. An influx of dissolved carbon dioxide will cause ocean acidification [4].

4. Conclusion
The distribution of pH on the surface water of Pulau Tuba is found to be normal. The developed model can be used for early detection of pH rises.

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MONITORING THE ESTUARINE ACIDIFICATION THROUGH MODELLING OF SURFACE WATER pH OVER KUALA PERLIS, PERLIS

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1. Introduction

Estuarine acidification could happen at the surface water due to the introduction of toxic in water or caused by weathering processes due to acid rains. At present, the baseline information of water pH at Kuala Perlis is found to be limited. We proposed a model for an early detection of river acidification.

2. Methodology

An accuracy assessment was carried out after the integration data of the spatial information stage and validation of the model stage was done (see Figure 1).
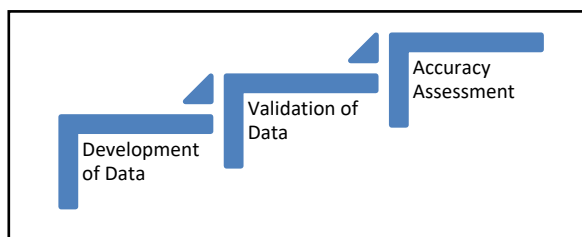
Figure 1. Methodology

3. Results & Discussion

The model has been developed successfully using the IDW interpolation method. The research found that the mean prediction error and root mean square prediction errors were found at 0.009 and 0.294, respectively.

The pH directly measures the activity of the hydrogen ion (H) [1]. The lower the pH, the higher the (H) activity and the more acidic is the water [2]. Streams and rivers transporting large quantities of humic materials containing colloidal suspensions are generally acidic in nature [3]. The pH values change from acidic to alkaline when colloidal particles mix with seawater and become coagulated. The pH level was found to be normal despite the location of the study area being close to restaurants and ports.

4. Conclusion

The research had produced the map of pH. The product can be utilised to monitor the estuarine acidification at Kuala Perlis, Perlis.

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MONITORING THE SALT-FRESH TRANSITION ZONE THROUGH MODELLING OF SURFACE SALINITY OVER PULAU TUBA, KEDAH

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Keywords: Spatial interpolation, Salinity, Transition zones.

1. Introduction
The integration of spatial information allowed environmentalists to produce spatial information on salt fresh transition zones in the study area of Pulau Tuba. There has been much research conducted using the same methods [1].

2. Methodology
The salt fresh transitional zones could be determined using the relationship as presented below:
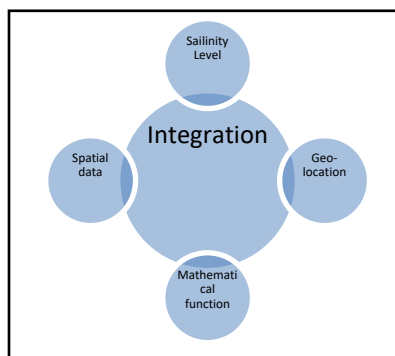
Figure 1. Relational model

3. Results & Discussion
The mathematical function used in this research produced low errors. The data indicates that the inner part of Pulau Tuba is experiencing a brackish environment while the outer part is experiencing the dominant saltwater condition.

A brackish environment has less pH value indicating less salt when compared with the sea or coastal areas [2]. The transition zone between the sea and estuarine zone is remarkably interesting to be studied as animals and plants that lived here need to withstand the sudden change of salt content as the tidal activity can be another factor that governs this area [3].

4. Conclusion
The research has concluded that the inner part of the islands has a moderate brackish environment while the open sea condition dominates the eastern part.

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MONITORING THE EFFECTS OF GLOBAL WARMING THROUGH MODELLING OF SURFACE WATER TEMPERATURE OVER PULAU TUBA, KEDAH

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1. Introduction

The global scale of determining the sea surface temperature has lacked accuracy, especially when dealing with an area that has a high canopy of mangrove ecosystems. The researcher is trying to build a system based on a map to detect the effects of global warming on the surface temperature of Pulau Tuba, Kedah.

2. Methodology

The surface water temperature was sampled using the YSI probe and lowered to 1m. Figure 1 shows the integration of attribute data for the development of the temperature model.
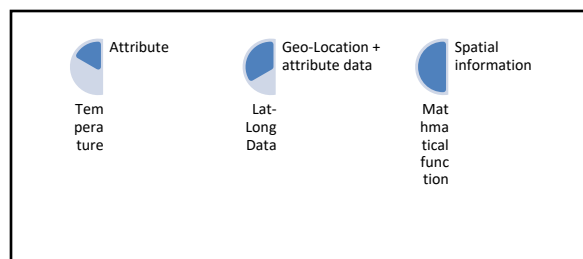
Figure 1. Methodology

3. Results & Discussion

The result indicates that the temperature is distributed normally around the island. Furthermore, the integration of the attribute data and the mathematical function allows one to better understand and visualize the distribution of temperature.

The research outlined that different species of fish have different needs for an optimum temperature and tolerances of extreme temperatures [1]. Many of the physical, biological, and chemical characteristics of a river are directly affected by temperature [2]. Most waterborne animal and plant life survive within a certain range of water temperatures, and only a few of them can tolerate extreme temperature changes.

4. Conclusion

The hottest time can be experienced during noon as tropical weather dominates the area's coastal ecosystem.

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MONITORING THE IMPACT OF HYPOXIA THROUGH MODELLING OF SURFACE WATER DISSOLVED OXYGEN OVER SUNGAI MERBOK, KEDAH

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1. Introduction

To support the 2030 agenda on the Sustainable Development Goal 14 (SDG14): Life below water, the research has an intention to analyse the spatial and temporal distribution of dissolved oxygen (DO) at Sungai Merbok, Kedah.

2. Methodology

Figure 1 shows the variables involved in the development of the model for the detection of hypoxia zones where DO is at 0 mg/L.
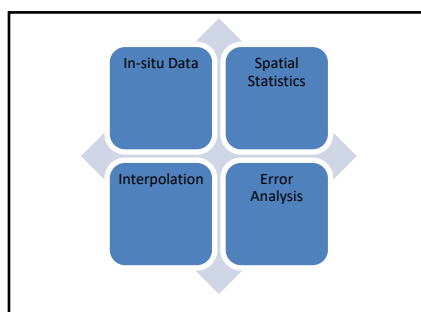
Figure 1. Elements of methodology

3. Results & Discussion

Our study has found that some areas have indicated a low reading of DO level. However, this result has not reached the stage where the hypoxia condition was met.

Maintaining good water quality is very crucial and compulsory as bad water quality will have huge effects and impacts, not only on humans but also on the environment we live in [1]. Unfortunately, bad water quality often occurs due to pollution caused by the human being itself [2]. Water pollution occurs when harmful substances such as chemicals or microorganisms contaminate the water bodies like the sea, river, and lake [3]. The harmful substances may come from the oil spilt on the sea by ships, the untreated wastewater from factories, fertilizer runoff from the farm, trash dumping into the river and many more in lowering the DO level.

4. Conclusion

The research indicates that with low mean prediction error (0.004) and the root mean square prediction error (1.207). The model has high accuracy.

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MONITORING THE CLIMATE CHANGE IMPACTS THROUGH MODELLING OF SURFACE WATER TEMPERATURE OVER SUNGAI MERBOK, KEDAH

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Keywords: Climate change, Temperature, Sungai Merbok.

1. Introduction

Climate change can adversely affect the marine environment by adding more heat to the water. We proposed a system to alert the temperature fluctuation in water especially at Sungai Merbok, Kedah, where socioeconomic sectors are found to be important and promising.

2. Methodology

We proposed an alert system for climate change effects on the sea surface temperature for Sungai Merbok. Figure 1 shows the components for the development of an alert system.
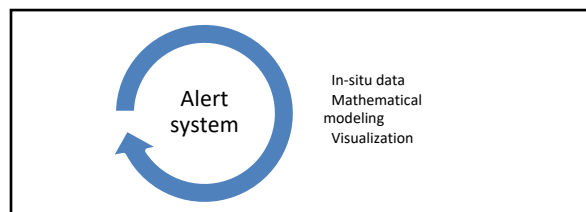
Figure 1. Components for the alert system for sea surface temperature

3. Results & Discussion

The temperature along the river is found to be normal. However, the decreasing temperature can be observed from upstream to downstream. The upstream of the river has abundant mangrove trees which will shade the water and reduce the temperature [1].

Temperature variation is usually influenced by the influx of warm water from tributaries and the resulting decrease in salinity.

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MONITORING THE AEROBIC BIOLOGICAL PROCESS THROUGH MODELLING OF SURFACE WATER BIOCHEMICAL OXYGEN DEMAND OVER SUNGAI MERBOK, KEDAH

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Keywords: Aerobic biological, Mathematical functions, BOD.

1. Introduction

A biological process by microorganisms could degrade biochemical oxygen demand required in any water environment. At present, there is no information on the status of Biochemical Oxygen Demand (BOD) at Sungai Merbok, Kedah.

2. Methodology

The DO meter was used to measure oxygen level in taken samples for five days. The statistical function was integrated for the prediction of BOD. Figure 1 shows the process diagram.
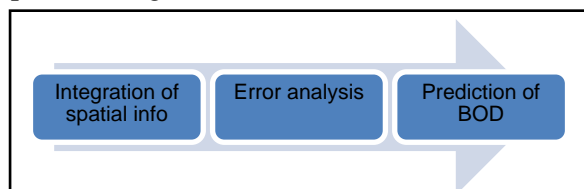
Figure 1. Process diagram

3. Results & Discussion

The root mean square prediction error was determined at 1.503 for the current system. The system must exhibit low error reading to ensure high prediction accuracy.

BOD determines the strength of pollutants in terms of oxygen required to stabilize domestic and industrial wastes. A minimum of two to seven mg/L of dissolved oxygen level is to be made consistent during the experimentation or should be available in natural waters for the reduction of oxidizable organic matter to start [1]. BOD also determined the amount of food for bacteria found in water [2]. The BOD test provides a rough idea of how much biodegradable waste is a sample [3]. Based on the research, the BOD in the study area was at normal levels.

4. Conclusion

The map produced can be used by the agency to protect the water environment at Sungai Merbok, Kedah. We proposed the system to be used for monitoring aerobic biological processes.

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MONITORING THE EUTROPHICATION PROCESS THROUGH MODELLING OF SURFACE WATER AMMONIA OVER PULAU TUBA, KEDAH

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1. Introduction

Eutrophication is caused by the excessive introduction of ammonia into the water. To date, there has been no information on the status of eutrophication at the coastal waters of Pulau Tuba, Langkawi.

2. Methodology

Detection of ammonia was done using a UV-VIS spectrophotometer. Data were interpolated using the IDW method. Figure 1 shows the process diagram.
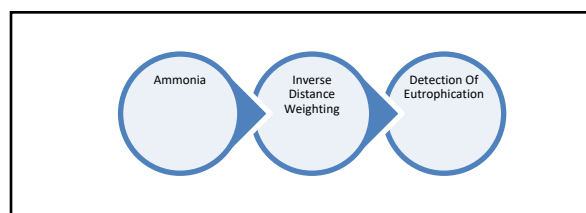
Figure 1. Methodology

3. Results & Discussion

The error regression function was determined as $0.386*x+0.0571$. The error Regression function was determined as $-0.614*x+0.057$. The mean prediction error and root mean square prediction errors were determined at -0.034 and 0.193, respectively.

Ammonia contains high toxic contents, and it is present everywhere in the marine water systems [1]. The entering of ammonia into seawater include some sources from industrial wastes, effluent ions of sewage, fuel consumption, conversions and fuel refinement, and from the agricultural vicinity where the application of the commercial fertilizer is placed. From the study by [2], the ammonia entering the seawater process is a product of natural biological degradation that comes from organic matter. When calcium hardiness ascends, ammonia toxicity will descend at constant pH [3].

4. Conclusion

The product can be used as guidance to monitor the eutrophication process at Pulau Tuba, Langkawi, Kedah.

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MONITORING THE WATER CLARITY THROUGH MODELLING OF TOTAL SUSPENDED SOLIDS AND TOTAL DISSOLVED SOLIDS OVER PULAU TUBA, KEDAH

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1. Introduction
This research is carried out to investigate the pattern of surface water Total Suspended Solids (TSS) and Total Dissolved Solids (TDS) at Pulau Tuba, Kedah by proposing a water clarity system.

2. Methodology
Gravimetric analysis was used for the measurement of TSS, and TDS was measured using a TDS meter. Figure 1 shows the development of the water clarity system for Pulau tuba, Langkawi.
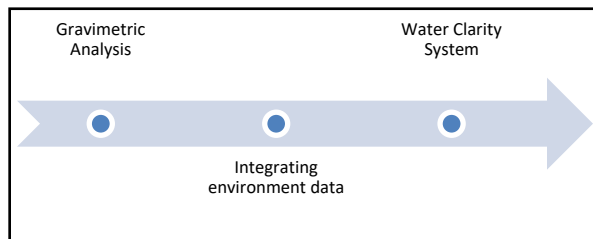
Figure 1: Methodology

3. Results & Discussion
The system produced the mean prediction error of 1.24 and root mean square prediction of 263.127 for TSS and TDS, the mean prediction error recorded at -658.702 and the root mean square prediction error of 6801.111. The majority of solids were contributed by high sedimentation during rainy seasons or wet seasons [1]. Soil erosion considers the source of suspended solids that comes from the surrounding area caused by human activities [2].

The TSS level usually increased at the middle of the estuary and further downstream due to wastewater disposal and an influx of run-off from the upper reaches [3]. TDS levels have been affected by the mixing of estuarine and seawater ecosystems.

4. Conclusion
An evaluation system of water clarity is possible since the model produced a low error and can be used to monitor the river.

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MONITORING THE DEAD ZONES THROUGH MODELLING OF SURFACE WATER DISSOLVED OXYGEN OVER PULAU TUBA, KEDAH

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Keywords: Dead Zones, Dissolved oxygen, Pulau Tuba.

1. Introduction
The Dead zones are considered areas with extremely low or no dissolved oxygen at all due to anthropogenic activities. Here, we proposed a model to detect the dead zones using concentrations of Dissolved Oxygen (DO) at Pulau Tuba, Langkawi.

2. Methodology
Integration of data involved the spatial data and *in situ* concentration of DO. Figure shows the relationship of each parameter to develop the system.
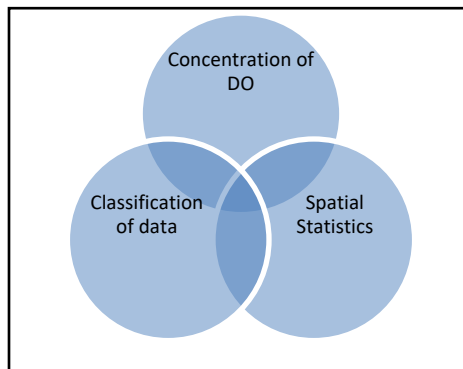
Figure 1. Relationship model

3. Results & Discussion
DO refers to the oxygen content in the water body [1]. Oxygen that goes into the water bodies literally comes from the aquatic plants and the atmosphere [2]. The oxygen content that is present in running water is higher compared to the still water [3]. The fast-accelerating stream will dissolve higher concentration of oxygen than a lake or pond [4]. Microscopic algae are the primary source of oxygen for a water body. The dead zones can be predicted using the model as it contains low mean prediction error (-0.014) and the root mean square error (0.674). The results indicate that Dead Zones are not found around the coastal waters of Pulau Tuba, Kedah.

4. Conclusion
The developed IDW model for DO could help monitor dead zones for Pulau Tuba, Kedah.

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SIC

MONITORING THE RIVER ACIDIFICATION THROUGH MODELLING OF SURFACE WATER pH OVER SUNGAI MERBOK, KEDAH

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Keywords: pH, Acidification, GIS, Sungai Merbok.

1. Introduction
This research is carried out to investigate the pattern of water pH at Sungai Merbok, Kedah for assessment of the river acidification processes. The research used the Geographic Information System (GIS) for the development of the spatial-temporal model [1].

2. Methodology
The system started by collecting data on water pH using a pH meter. Integration of data was carried out using the spatial interpolation method of the IDW method. Figure 1 shows the methodology.
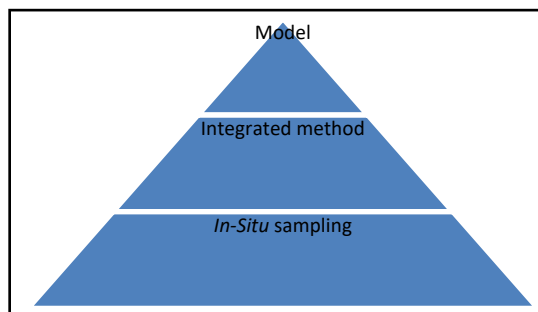
Figure 1. Methodology

3. Results & Discussion
The cross-validation processes indicated that the mean prediction error was found at -0.011 and the root mean square error was found at 0.947. The results show increasing pH value from upstream to downstream of Sungai Merbok, Kedah.

The sources that can influence the pH of the water can be both natural and man-made [2]. Examples of natural sources are limestone and carbonate materials which can neutralize pH by combining with both hydrogen and hydroxyl ions [3]. An example of a man-made source of pH fluctuations is acid rain which is related to pollution.

4. Conclusion
The research has produced a map of pH that has a lower value of the mean prediction error and the root mean square error of prediction. The model can be used as fundamental data for the early detection of river acidification.

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MONITORING THE ALGAE BLOOM PHENOMENA THROUGH MODELLING OF SURFACE WATER CHLOROPHYLL AND AMMONIA OVER SUNGAI MERBOK, KEDAH

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Keywords: Ammonia, chlorophyll-*a*, Algae bloom.

1. Introduction
The rapid bloom of algae in the freshwater and marine ecosystems can cause many problems. This research is carried out to investigate the pattern of surface water chlorophyll-*a* and ammonia at Sungai Merbok, Kedah.

2. Methodology
Detection of Chlorophyll-*a* and Ammonia was done using the UV-VIS spectrophotometer. Mapping was done using ArcMap applications and IDW methods. Figure 1 shows the method of the study.
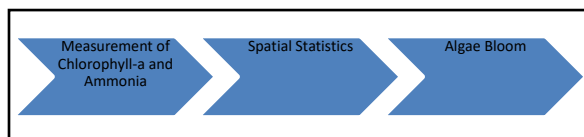
Figure 1. Method

3. Results & Discussion
Chlorophyll-*a* is one of the vital components for plants to conduct photosynthesis [1]. The colour reflected by chlorophyll-*a* is usually green and yellow thus making the phytoplankton appear in green or yellow colour [2]. Diatoms, cyanobacteria, and dinoflagellates are the few that carry chlorophyll-*a* [3].

The solubility of ammonia in water is high. Ammonia is preferable by algae to nitrate as extra energy enables it to decrease nitrate to ammonia [4]. The development spatial model can predict algae bloom conditions at Sungai Merbok, Kedah.

4. Conclusion
With low error (RMSE= 0.063), the map can be used for the prediction of ammonia and chlorophyll-*a* at Sungai Merbok, Kedah.

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POLYESTER-MCC BIO PRIMER COATING

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Keywords: Polyester, Microcrystalline cellulose, Primer, Bio filler, Corrosion.

1. Introduction

Corrosion occurs due to the failure of the coating and primer process that is one of the many parts of a coating system [1]. Polyester (UPR) is one of the materials used in primer coating which has low tensile, high shrinkage and brittle material [2]. Microcrystalline Cellulose (MCC) is a bio filler that has a high crystalline region in the structure which can improve the mechanical properties and is also environmentally friendly [3]. Therefore, the main purpose of this study is to identify the effect of MCC loading into the UPR/MCC primer coating.

2. Methodology

Microcrystalline cellulose (MCC) filler was weighted according to loading percent (2%, 4%, 6%, 8%, and 10%) poured and mixed with the polyester (UPR) in a vial bottle. It was dispersed over a period of 60 minutes in an ultrasonicator at a constant temperature of 27°C. UPR/MCC was added with MEKP for the curing process. The composite was coated on the metal substrate and underwent a 7 days curing process before testing.

3. Results & Discussion

The 4% of loading showed improvement in mechanical properties from H grade to 4H grade and has also recorded there is a massive improvement of adhesion test from 0B grade to 4B grade which is less than 5 % pulled. Low corrosion rate and high polarization resistance were also recorded for 4% loading compared to other loading.

Table 1. Hardness and adhesion results

Samples (%)	Hardness Result	Adhesion Result
Control	H	1B
2	4H	4B
4	4H	4B
6	3H	3B
8	3H	2B
10	3H	3B

4. Conclusion

4% of MCC loading improved the hardness and adhesion properties of the coating and improved the corrosion resistance of the coating.

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MONITORING THE EUTROPHICATION ACTIVITY THROUGH MODELLING OF NITRATE AND PHOSPHATE OVER PULAU TUBA, KEDAH

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Keywords: Nitrate, Phosphate, Pulau Tuba.

1. Introduction

Due to the increasing anthropogenic activities, we proposed a system to be used as a monitoring tool for nitrate and phosphate in the water of Pulau Tuba, Kedah.

2. Methodology

Samples were collected using Niskin Water Sampler and immediately transferred for laboratory assessment. Figure 1 shows the methodology for the experiment.
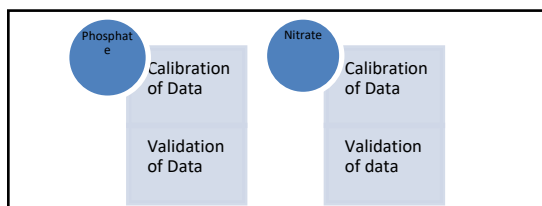
Figure 1. Method

3. Results & Discussion

Statistical information revealed that the root mean squared prediction error for nitrate is 0.078 and for the phosphate, the root mean square prediction error was found to be at 0.095.

The concentration level of nitrate is low in seawater. Nitrate is used as a basic source of nitrogen by phytoplankton [1]. The plant growth will achieve its limit when the concentration of nitrate is low in the aquatic vicinity. The problem becomes worse if the high quantity of nitrate can cause eutrophication [2].

A high amount of phosphate in seawater will cause an excessive amount of plant development in the environment [3]. When the concentration levels of phosphate were high in seawater, an algal bloom will occur in the vicinity [4].

4. Conclusion

The nitrate and phosphate compounds were found to be normal in the Pulau Tuba, Kedah.

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MONITORING THE OXIDIZABLE MATERIALS THROUGH MODELLING OF SURFACE WATER CHEMICAL OXYGEN DEMAND OVER SUNGAI MERBOK, KEDAH

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Keywords: COD, Organic waste, Sungai Merbok.

1. Introduction
The chemical oxygen demand (COD) can be used to measure the level of oxidizable materials in water, especially in rivers and estuarine ecosystems. The level of Sungai Merbok, Kedah COD is currently unknown.

2. Methodology
We used a geostatistical wizard in the ArcMap application to map the COD level. Mapping allows us to understand the current level of COD from a space-time perspective. Figure 1 shows the method for the detection and prediction of COD.
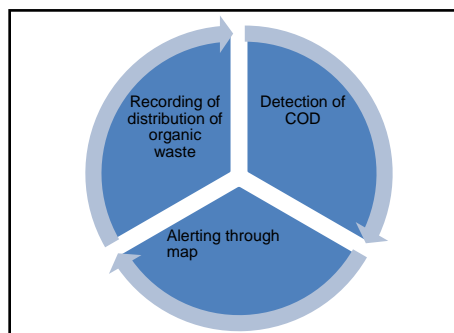
Figure 1. Methodology

3. Results & Discussion
The COD test is commonly used to measure the amount of organic and inorganic oxidizable compounds in water [1]. Most applications of COD determine the amount of total oxidizable pollutants found in surface water, making COD a useful measure of water quality [2]. It indicates the mass of oxygen consumed per litre of solution [3].

Based on the system, the COD level was found to be high in the middle of the Merbok river since there is an abundant organic waste in the form of dead leaves and falling branches. The model tabulated error is at 0.761 (RMSE).

4. Conclusion
The developed spatial model can be used for the monitoring of organic waste at the river.

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MONITORING THE WATER NUTRIENTS THROUGH MODELLING OF SURFACE WATER PHOSPHATE OVER SUNGAI MERBOK, KEDAH

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1. Introduction

The environmentalists used the spatial interpolation model to assess the environmental data. There has been no information on the distribution of phosphate at Sungai Merbok, Kedah.

2. Methodology

Here, we proposed the stages for modelling water phosphate. It is described using a flow chart as seen in Figure 1.
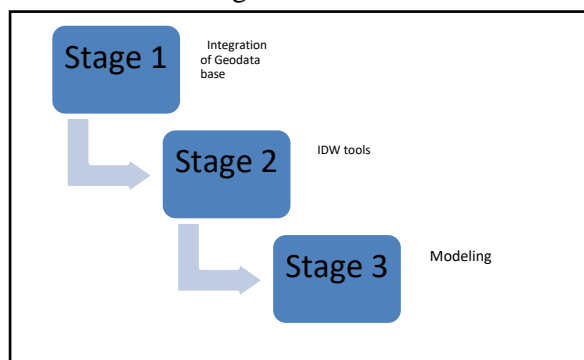
Figure1. Method

3. Results & Discussion

The optimal amount of phosphate concentration in seawater to stimulate plant growth is higher than 0.03 mg/L [1]. The man-made sources such as septic systems, the running off of fertilizers and the wastewater that get improper treatment can automatically cause a high level of phosphate in seawater [2]. Moreover, phosphate can enter seawater as some incidents that have happened, for example surface run-offs and bank erosions [3]. Besides that, the rising of nitrate levels in water is the factor of the addition of phosphate levels [4]. Where most biologists go in research involving the surface water, the seawater nutrients have been completely exhausted. In addition, the high or low concentrations of nutrients can control the development of plants in seawater. The phosphate in the water of Sungai Merbok was found to be normal.

4. Conclusion

The mean prediction error (0.00023) and the root mean square prediction error (0.0621) were found to be low and can be used for the prediction of phosphate at Sungai Merbok.

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MICROPLASTIC ACCUMULATION ON SEAGRASS BEDS IN TAK BAI RIVER, TAK BAI DISTRICT, NARATHIWAT PROVINCE, THAILAND

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1. Introduction

This study aimed to investigate the accumulation of microplastics on seagrass beds in Tak Bai River, Tak Bai District, Narathiwat Province, Thailand between September 2019 to February 2020. In this study, a *Halodule pinifolia* bed in Tak Bai River was selected to determine whether microplastics accumulated in seawater sediment can adhere to seagrass blades.

2. Methodology

Seagrass blades were collected using a quadrat (1 m ^{2}) by cutting at the base of blades with 3 replicates across 3 transect lines. 3 sediment samples were collected from each transect line to 5 cm depth using sterile glass jar. Seawater samples were collected using a plankton net tow (20 μm) along the transect line in both direction
(Following method from Jones *et al*., 2020)

3. Results & Discussion

There were 215 total particles of microplastics observed, 54 particles on seagrass blades, 116 particles in seawater and 45 particles in sediment. The discovered microplastics were mainly composed of fragments (47%) followed by fibre (43%) and flake (10%), respectively. Eight colours of microplastics were found. The dominant microplastics were blue (27%), followed by white (18%) and red (17%). The reason that ST3 area had more micro fragments than other studied areas was fishing, and tourism activities and fishing gears which were mostly blue.
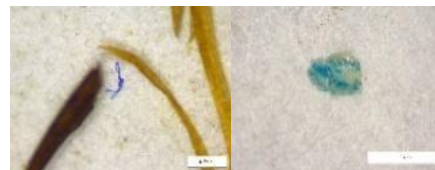
Figure 1. Example of microplastic found at Tak Bai River

Table 1. The number of microplastics found on seagrass blades, seawater and sediment at Tak Bai River

ST	No. of microplastic on seagrass blades (pieces/ blade)	No. of microplastic in seawater (pieces/liter)	No. of microplastic in sediment (pieces/ kg. dry weight)
1	0.44 $\pm$ 0.90	3.33 $\pm$ 6.21	2.91 $\pm$ 5.82
2	0.24 $\pm$ 0.73	4.44 $\pm$ 7.35	4.85 $\pm$ 9.79
3	0.31 $\pm$ 0.67	8.33 $\pm$ 15.26	6.79 $\pm$ 10.18

4. Conclusion

Our study has provided early evidence of microplastics on seagrass beds in Tak Bai River, Narathiwat Province. There were microplastics found in all sample types. Furthermore, future studies should focus on investigating microplastic contamination in the marine biota.

Acknowledgments

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MONITORING THE SEDIMENT QUALITY THROUGH MODELLING OF ORGANIC MATTER AND pH FOR THE STRAIT OF PULAU TUBA AND DAYANG BUNTING, KEDAH

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Keywords: Organic matter, Soil, pH, Pulau Dayang Bunting.

1. Introduction
The sediment quality and pH play important roles in determining the bottom sediment's fauna. The research measures the level of the organic matter (OM) and pH at the Strait area of Pulau Tuba-Dayang Bunting.

2. Methodology
Sediment samples were collected using a Van Veen Grab sampler. Figure 1 shows the general method of the experiment.
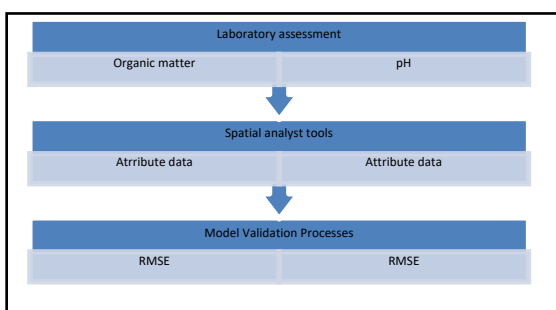
Figure 1. Method

3. Results & Discussion
The RMSE for OM were determined at 0.752. For the pH, the RMSE was found at 0.350.

Organic matter in transitional waters is a mixture originating from allochthonous and autochthonous sources [1]. An increase in eutrophication will increase the rate of organic matter production in an ecosystem [2]. High sedimentation rates can reduce the contact time between organic matter and dissolved oxygen in the water column, and therefore can contribute to higher concentrations of carbon [3]. The organic matter was in the form of mangrove litter.

Estuarine sediment usually has higher pH than the coastal area. The pH in sediment is contributed by the dissolved effects of coral and shellfish. pH was found to be normal.

4. Conclusion
The research has produced maps that could predict the distribution of OM and pH in sediment to explain the sediment quality.

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BIMETALLIC Au-Cu/TiO₂ CATALYST – ENABLING SUPERIOR CATALYTIC PERFORMANCE FOR NITROPHENOL REDUCTION

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Keywords: Au-Cu nanoparticles, Bimetallic, Nitrophenol.

1. Introduction
This research highlights the preparation of bimetallic Au-Cu on TiO₂ as the heterogeneous catalyst for *p*-nitrophenol (*p*-NP) reduction. Conventional Au-Cu is in colloidal form which experiences difficulty during catalyst recovery resulting in the loss of the catalyst. Thus, this research proposes the immobilization of Au-Cu on anodic TiO₂ by spin coating technique and evaluates the catalysis in *p*-NP reduction.

2. Methodology
2.1. Synthesis of Au-Cu on TiO₂
The TiO₂ membrane was fabricated via electrochemical method as reported [1]. The preparation of Au-Cu is according to [2]. The effect of the capping agent, hexadecylamine (HDA), was also varied during the synthesis of colloidal Au-Cu.

2.2. Catalytic reduction of *p*-NP
The Au-Cu/TiO₂ (1 mg) was put in a cuvette containing *p*-NP (0.05 mM, 1.5 mL) and NaBH₄ (15 mM, 1.5 mL). The activity is studied kinetically and monitored by UV-Vis.

3. Results & Discussion
Figure 1 shows the photograph of anodic TiO₂, Au-Cu/TiO₂ H1 and H2. The deposition of Au-Cu on TiO₂ is confirmed by FTIR analysis. Meanwhile, the activity of the prepared catalysts over *p*-NP reduction illustrates fast reduction of high rate constant value (*k*) as in Table 1.
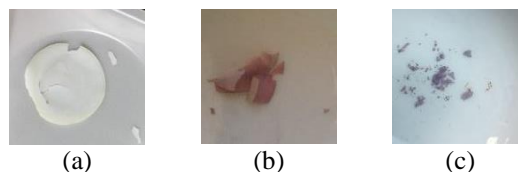
Figure 1. Photograph of (a) TiO₂, (b) Au-Cu/TiO₂ H1 and (c) Au-Cu/TiO₂.

Table 1. The *k*-value of catalyst for *p*-NP reduction

Catalyst	k-value (s⁻¹)
Au-Cu/TiO₂ H1	3.45×10^{-5}
Au-Cu/TiO₂ H2	1.00×10^{-4}

4. Conclusion
Heterogenous Au-Cu/TiO₂ catalysts of superior activity have successfully been prepared for *p*-nitrophenol reduction.

Acknowledgments

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POTENTIAL OF DES AS A CATALYST FOR REDUCING ACID VALUE OF NEEM BIODIESEL

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Keywords: Deep Eutectic Solvent (DES), Acid value.

1. Introduction

The biodiesel manufacturing from vegetable oil is currently a successful approach for generating energy to substitute fossil fuels while maintaining environmental sustainability. Neem seed capability to yield up to 40% oil, makes it ideal for biodiesel production. However, the oil's high acid value (AV) is a major concern, leading to saponification resulting in low biodiesel yield. As more research has been made to produce more sustainable production technologies, Deep eutectic solvents (DES) have gained widespread recognition as a catalyst. Hence, this study aims to determine the effect of DES in reducing AV and biodiesel yield.

2. Methodology

Neem oil, methanol and catalyst (DES) were esterified at varying temperatures ranging from 60 - 90 ℃, catalyst loading 2 wt%, 2 hours reaction time, and methanol-to-oil molar ratio from 3 to 12.

3. Results & Discussion

The effect of methanol to oil ratio and temperature on acid value and biodiesel yield was tabulated in Table 1.

Table 1. The effect of Temperature and MeOH:Oil on AV and Biodiesel Yield (%).

MeOH:Oil Temp.	3:1 AV	Yield	6:1 AV	Yield	9:1 AV	Yield	12:1 AV	Yield
60°C	16.27	5.2	10.66	5.2	7.29	6	2.81	28
70°C	10.1	14	10.1	14	8.42	28	8.42	28
80°C	9.15	12	8.98	12	7.85	14	3.93	18
90°C	10.66	14	8.98	14	8.77	15.2	7.29	19

At 60°C, the acid value decreased significantly from 16.27 to 2.80 mgKOH/g with the increase of methanol-to-oil ratio from 3:1 to 12:1. The AV was slightly reduced in the increase of MeOH: oil ratio at a higher temperature (70°C-90°C). The highest FFA conversion (86.07%) was produced at a catalyst loading of 2wt% of DES, temperature of 60°C, and methanol/oil molar ratio of 12:1.

As for the biodiesel yield, it increased with the increase of temperature and MeOH:Oil ratio. The highest yield obtained was 28%, at 70°C with 9:1(MeOH: Oil), and it remained constant after the methanol was added to the 12:1 methanol to oil ratio. The trend at 60℃, 80℃ and 90℃ shows a slight increase with the increase in MeOH:Oil ratio.

DES was, therefore, able to reduce the AV from 20.19 to 2.8 mgKOH/g, increasing the yield up to 28%. Liu and Wang [1] prove the ability of the postulated DES (P-DES) by yield 98.66 % biodiesel under optimal conditions: 8% P-DES catalyst, 8:1 MeOH: Oil ratio, and 110°C

4. Conclusion

DES is capable of reducing the AV of Neem biodiesel.

Acknowledgments

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LSTM VS GRU IN PREDICTING GOOGLE STOCK PRICE

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Keywords: LSTM, GRU, RNN, Deep learning.

1. Introduction
Recurrent neural network (RNN) is a type of feed-forward neural networks connection that connects the output of hidden-layer neuron as an input to the same hidden-layer neuron that allows previous time-step taken [1]. RNN helps in solving almost all world problems such as in the industry of automotive & transportation, healthcare & medicine, retail and more [2].

2. Methodology
Models of LSTM and GRU were constructed in Python programming. They were trained and tested by using 6 years of daily observation of Google stock price.

3. Results & Discussion
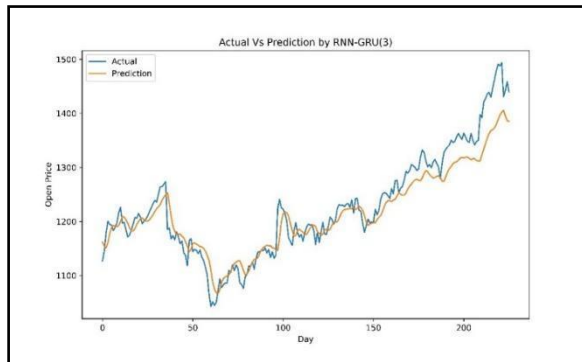
Figure 1. Prediction by RNN-GRU(3) model

Figure 1 shows the plot of RNN-GRU(3) prediction model on the Google Stock Price. The value of prediction is close to the actual values which means that the models are able to capture the movements and directions of the stock price. The performance measurement of the model showed excellent results which are

1.92 value of MAPE and 24.36 value of MAE which indicated good performance of the model compared to other models.

4. Conclusion
It can be concluded that model RNN-GRU(3) is the best model in capturing dependencies by giving the prediction value of stock price close to the actual value.

Acknowledgments

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APPROACHING REVIEW OF SNAPCHAT APPLICATION USING SENTIMENT ANALYSIS

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1. Introduction

Sentiment analysis is a type of study which enables the researchers or product developers to analyze users' comments, opinions or expressions towards certain products or services [1]. Sentiment analysis is performed to extract opinion and subjectivity knowledge from user generated text content without the need to monitor the reviews manually and help to define the user's review in polarity to differentiate the user opinion[2]. Sentiment analysis works better on text that has a subjective context than it does on text with only an objective context since subjective text contains an expression of human feeling or emotion lying under the text.

2. Methodology

The analytical library of Polarity Classification with VADER, Naïve Bayes Classification, Word Cloud Visualization, Random Forest, and confusion matrices as the performance measurements of the models.

3. Results & Discussion

Based on the performance measurement, it is found that the model of Multinomial Naïve Bayes classification model was slightly better than the Random Forest in predicting rating by users with 0.5495 value of accuracy, and weighted average precision, recall and F1-score value for Multinomial Naïve Bayes are slightly better than the Random Forest.

4. Conclusion

The results indicated that the performance of Multinomial Naïve Bayes is better than the Random Forest in classifying ratings by Snapchat's users.

Acknowledgments

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MULTIDIMENSIONAL NETWORK ANALYSIS OF STOCK MARKET BEHAVIOUR DURING COVID-19 OUTBREAK: BURSA MALAYSIA

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Keywords: Multidimensional stock analysis, Centrality measure, Granger causality test.

1. Introduction

The stock market is a complex system due to the interrelationships among the stocks. They are complicated and unpredictable [1]. As Covid-19 pandemic may affect the Bursa Malaysia, multidimensional network analysis is applied to the top 100 capitalized stocks of Bursa Malaysia to investigate their behaviour during the Covid-19 outbreak.

2. Methodology

The data before Covid-19 outbreak is collected from December 2018 to November 2019, while from December 2019 to July 2020 represents the period of the pandemic outbreak. To obtain the complete information of the Bursa Malaysia stock network, the similarities between multidimensional stocks are quantified by using RV coefficient while minimum spanning tree and centrality measures are applied to determine the behaviours of the stocks from the network. Then, the stocks connected with dominant stock are further investigated for their causal relationship using the Granger causality test.

3. Results & Discussion

The network before and during Covid-19 outbreak are displayed in Figure 1 and Figure 2 respectively. In the figures, the stocks are coloured according to the economic sectors. The dominant stock before Covid-19 outbreak was IJM, but the stock market was not monopolised by the construction sector. Meanwhile, MBSB and ABMB from the financial services sector play a crucial role and has bidirectional Granger causality relationship with many sectors during Covid-19 outbreak
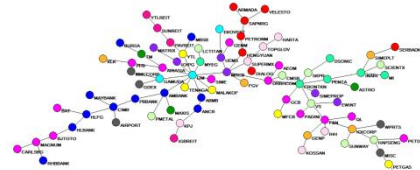
Figure 1. Forest of all possible MSTs of Top 85 Bursa Malaysia before Covid-19 outbreak
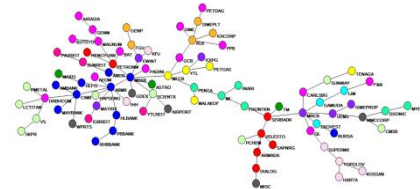
Figure 2. Forest of all possible MSTs of Top 85 Bursa Malaysia during Covid-19 outbreak

4. Conclusion

In conclusion, the financial services sector plays a vital role and has bidirectional Granger causality relationship with other sectors during Covid-19 outbreak. Thus, it is recommended to improve on the financial services sector as it is the key sector during the pandemic.

Acknowledgments

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STOCHASTIC MODELLING OF TRAFFIC ACCIDENTS IN SKUDAI, JOHOR, MALAYSIA

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Keywords: Daily accidents, Fatal accidents, Fatal victims, Accidents hazard level, Goodness-of-fit test.

1. Introduction

Road traffic accidents are uncertain events, sudden and catastrophic. Poor comprehensive public transportation development in Skudai, Johor led to a high number of registered vehicles. Therefore, road accidents are increasing. This study focuses on the application of stochastic modelling on traffic accidents in Skudai with the purpose of having a better understanding of the road accidents occurrences.

2. Methodology

Three types of data were provided by the Northern Johor Bahru Police headquarter, Skudai from 2015 to 2019, which are the number of daily accidents, number of daily fatal accidents, and number of daily fatal victims. Data visualization and descriptive statistics were used to analyse the pattern and summarize the daily accidents. To estimate the accident parameters which are the daily accident rate, daily accident hazard level, probability of daily fatal accidents, and daily fatal victim rates, the method of moment was applied by using three stochastic models. They are Generalized Poisson (GP) distribution, Generalized Poisson-Quasi Binomial (GPQB) distribution, and Generalized Poisson-Generalized Poisson (GPGP) distribution [1]. The goodness-of-fit test was applied to investigate whether those models significantly fit the data.

3. Results & Discussion

The findings showed that the overall accident rate has increased and the accident hazard level has slowly increased, but the probability of fatal accidents and fatal victims rate has decreased in Skudai. The findings also showed that the GP model significantly fit only to the 2017 and 2019 data while the GPGP model significantly fit to the 2017 data. For the GPQB model, it does not significantly fit with all of the years.

4. Conclusion

Since the stochastic modelling in the road accidents field has only a little research, it can be further studied to test or modify to be applied in a specific locality by using the latest accident data. If the models are suitable to be applied in the latest data, it may be embedded into software analysis tools to facilitate the calculations for future analysis.

Acknowledgments

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PROTOTYPE OF PORTABLE HYPOCHLOROUS ACID PREPARED FROM PATTANI SALTERN

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Keywords: Sodium chloride salt, Hypochlorous acid, Electrolytic cell, Electrolyzed acid water, COVID-19.

1. Introduction

Hypochlorous acid (HOCl) destroys the COVID-19 virus faster than alcohol in only 10 seconds and it is non-toxic. Hypochlorous acid can be prepared by using an electrochemical reaction to salt. This sweet salt is abundant in Pattani province salt-farms and contains many minerals. This research is to create a portable hypochlorous acid. Therefore, it is designed as a ready-made bottle that can be added salt and prepared in daily life.

2. Methodology

2.1. Equations

Based on the electrolytic cell, Hypochlorous acid can be prepared by using the following equation:

$$Cl_2 + H_2O + OH^- \longrightarrow HOCl + Cl^- + H_2O \quad (1)$$
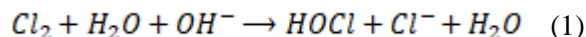
3. Results & Discussion

The concentration of hypochlorous acid was determined by argentometric methods. We found that 1.0 g salt with 1000 mL tap water under the 12 V electricity and 23 A for 10 min produced around 55-277 mg/L of hypochlorous acid concentration.

All elements in Pattani salt-farm were analyzed by XRF and results showed there are 69.88% Cl, 15.55% Na, 9.11% O, 3.73% Mg, 0.59% S, 0.55%, K and 0.30% Ca. The sodium sulphate $(Na_2S_2O_3)$ compound available in the Pattani salt-farm is as shown in Figure 1.
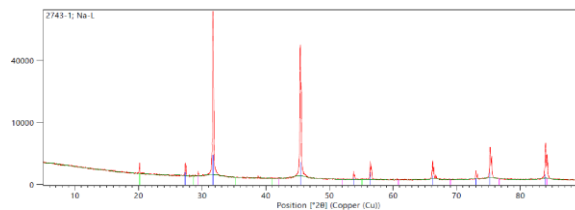
Figure 1. XRD pattern of Pattani salt-farm

4. Conclusion

The variety of ions allowed for a better preparation of hypochlorous acid and this is the reason Pattani salt is usually called sweet salt.

Acknowledgments

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ISHA: IMPROVE SURFACE COATING AND HIGH ADSORPTION ON WASTEWATER TREATMENT

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Keywords: Adsorption, Environment, Industry, Photocatalyst, Wastewater.

1. Introduction

Photocatalysis process for wastewater remediation is now becoming challenging due to the treatment process of a thousand liters wastewater per hour as well as inconsistency of solar irradiation [1]. An improved smooth surface and extremely high adsorption of immobilized TiO_2 photocatalyst (ISHA) was developed to solve the problem in the wastewater treatment process. The uniqueness of ISHA is that it will undergo extremely high adsorption of dye, which is 19 times faster compared with normal TiO_2 and treatment process will continue by replacing with new ISHA while adsorbed ISHA with dye will undergo cleaning process by using UV light irradiation prior reused for the next cycle.

2. Methodology
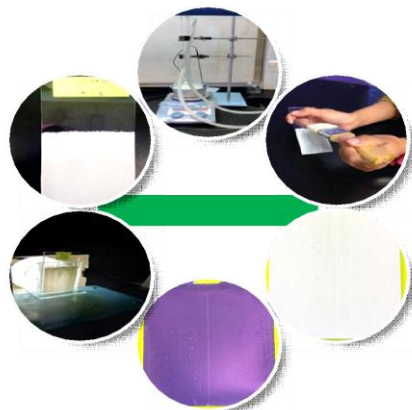
Figure 1. The operation setup in preparing ISHA

3. Results & Discussion
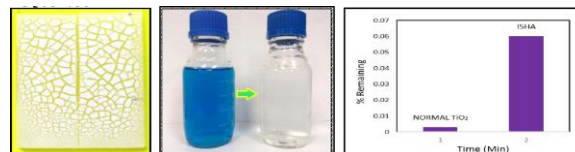
Figure 2. The pictures of a) normal TiO_2 immobilized coating b) MB dye before and after treatment and c) percentage MB dye removal

- Reduce one of the environmental problems using ISHA.
- Able to adsorb high concentration dye with less time consuming, 19 times faster compared to normal TiO_2.
- High volume of wastewater can be treated with low cost.
- Extremely high adsorption and reusable product.
- Less time for recovery and adsorption.
- Able to compete with commercial TiO_2 and activated carbon adsorption processes.

4. Conclusion

Better surface coating of TiO_2 on the plate enhances adsorption rate at high concentration of dye.

Acknowledgments

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CONVERTING AGRIWASTE TO WEALTH: CASSAVA PEEL AS NATURAL ORGANIC PRE-EMERGENCE HERBICIDE

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Keywords: Ageratum conyzoides, Cassava peel, Cyperus distans, Eleusine indica, Manihot esculenta.

1. Introduction

Excessive use of herbicide could lead to environmental pollution, human health concern [1] and weed resistance [2]. An environmental friendly strategy is needed for sustainable weed management. This study aims to examine the potential of cassava (*Manihot esculenta* L.) peel residues against three weed species and to identify bioactive compounds of peel residues.

2. Methodology

The experiment examined cassava peel residues against *Ageratum conyzoides*, *Eleusine indica,* and *Cyperus distans.*

2.1 Peel residues experiment

Cassava peel residues were dried, ground to powder form (<2mm) and applied as mulch at rates of 0, 1, 2, 4 or 8 ha^{-1} against weed seeds on soil surface in the greenhouse.

2.2 Germination bioassay

Germination of each weed species was tested in 500 ml/L concentration crude fractions of ethyl acetate on the Petri dish and incubated in the seed germinator.

2.3 Identification of active compound

The crude fractions of ethyl acetate extracts were identified by LC-MS (Liquid Chromatography-Mass Spectrometry analysis.

3. Results & Discussion
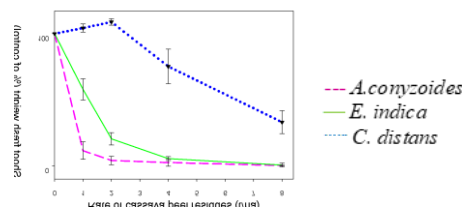
Figure 1. Phytotoxic effects of cassava peel residues on shoot fresh weight of weeds
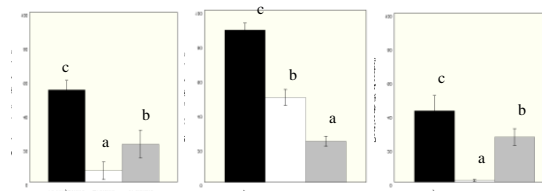
Figure 2. Germination bioassay of ethyl acetate fraction against three weed species.
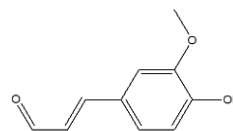
Figure 3. Structure of Trans-feruladehyde. Allelochemical compound detected in cassava peel.

4. Conclusion

Cassava peel residue could be formulated as novel and eco-friendly natural pre-emergence herbicide to suppress weeds.

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PERFORMANCE STUDY OF 180 WP TYPE SOLAR PANEL BASED ON THE AIR COOLING SYSTEM AND THE BOUNDARY LAYER THICKNESS ON THE PANEL SURFACE

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Keywords: Air speed, Boundary layer, Efficiency, Solar panels.

1. Introduction

When converting light into electrical energy, the performance of the solar cell decreases due to the emergence of heat from the surface of the solar panel. The efficiency of the solar cell decreases to 0.5% for every 1ºC increase as a result of heat energy [1]. Cooling the panels using an appropriate forced cooling method can partially solve these problems. The method used in this research was forced cooling through air above the panel surface and the study analyzed the effect of boundary layer thickness on the performance of solar panels.

2. Methodology

This study used 4 monocrystalline solar panels of type 180 WP with 3 panels with a cooling system with variations in fan air speed of 2.3 m/s, 3.106 m/s and 3.6 m/s and one panel without a cooling system. The data taken in this study were the panel efficiency value based on the value of I-V characteristics and solar radiation. Data was recorded every hour from 09:00 am to 04:00 pm with the help of a pyranometer.

3. Results & Discussion

Figure 1 shows the efficiency value of four solar panels. Solar panels that used a cooling system with an air velocity of 3.6 m/s had the highest efficiency value. Hence that the cooling system was very influential on the performance of the solar panels.
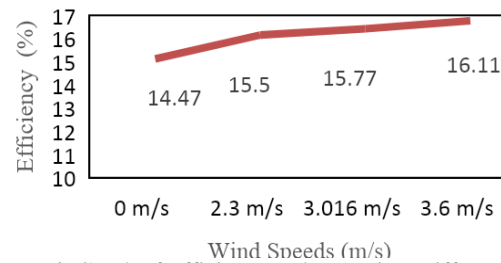
Figure 1. Graph of Efficiency Value Against Different Wind Speeds

Table 1. Data from Calculation of Boundary Layer Thickness

Testing (m/s)	Boundary Layer Thickness (m)
0	0
2.3	0.01707
3	0.01488
3.6	0.01358

4. Conclusion

Solar panels that used a cooling system with an air velocity of 3.6 m/s had a low boundary layer thickness and were very effective in increasing the efficiency of solar panels.

Acknowledgments

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Gracilaria changii & *Gracilaria salicornia* TO BIOPLASTIC FILM – KEY FUTURE FOR ECOLOGICAL AND COMMERCIAL IMPORTANCE

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Keywords: Algae, Bioplastics, Commercial, Red seaweed, Seaweed.

1. Introduction

The increase in the global demand for plastic materials has resulted, especially in marine pollution of plastic waste [1]. Since red seaweed is harvested in the sea, it does not compete with terrestrial crops, arable land, food, and freshwater [2], and is more suitable to be transformed into bioplastic materials.

2. Methodology

A survey was conducted to understand the respondents' opinion regarding seaweed as a bioplastic film and their awareness of plastic pollution.

3. Results & Discussion

The questionnaire was answered by 62 respondents using the Google Form application. The demographic data show 75.8% of the respondents were female, 50% were between the ages of 21-23, 82.3% had tertiary level education, 79% were students and 54.8% were living in an urban area.

In the second section of the questionnaire, most of the respondents have not heard about bioplastic made from algae (58.1%), but most of them have tried products that are made from algae (seaweed) (58.1%). 72.6% of respondents know that Malaysia is listed as one of the countries with the highest consumers of plastic in Southeast Asia. 96.8% of the respondents agreed that seaweed farming should be expanded to produce more bioplastic films. 85.5% of the respondents said they would like to change from synthetic to bioplastic film from algae. Finally, 91.9% of them agreed that bioplastic from algae is the key in improving the economic opportunities and our environment.

4. Conclusion

The findings have shown that seaweed has opportunities to improve the income of the rural area. Besides, the biodegradability of these species would reduce pollution, especially the microplastic pollution that can harm human health and the ecosystem.

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IMPLEMENTATION OF INTERNET OF THINGS IN WATER USAGE MONITORING APPLICATION FOR BOARDING HOUSES AND RENTED HOUSES

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Keywords: Internet of Things, Monitoring, Water usage.

1. Introduction

Nowadays, there are many businesses in the field of rented boarding houses and rented houses, where some owners do not have the means to know and control the amount of water used by the tenants. The cause of excessive use of water tends to stem from the idea that water will always be there and will not run out. If there is no control in limiting the use of water, it can lead to a water crisis. There are many implementations of Internet of Things in various domains such as transportation, healthcare, personal, social, and smart environment [1,2]. In this study, Internet of Things technology was used to identify excessive use of water and automatically alerted the owner and tenants. The application also allows the owner and the tenants to monitor the monthly water usage.

2. Methodology

In the sensing layer, several water flow sensors were used to report the water usage of each room. Each sensor was calibrated using a measured volume of liquid. The water flow sensors were connected to a NodeMCU ESP8266 which were connected to the application server via WLAN in the network layer. In the service layer, the water flow data collected was analyzed and reported back to the owner and the tenants via web application in the interface layer.

3. Results & Discussion

The web application produces historical data on water usage as shown in Figure 1 as well as notifies the owner and the tenants when the water usage exceeds the maximum threshold.

Figure 1. Water usage report

4. Conclusion

This application will help increase public awareness for not using water excessively.

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DEVELOPMENT OF BIO-FERMENTED CLEANING AGENT OF FRUIT PEELS RESIDUES

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1. Introduction

Normally, developed countries have a lot of waste produced by humans. The waste generated in the community is organic solid waste. The increase of organic waste is influenced by the increase in the consumer demand for vegetables and fruits in the community. This research focused on increasing the value of fruit peel residues by using them in an environmentally friendly cleaning product. This study supports the approaches to environmental management in the community by creating an innovation from waste materials for sustainable development.

2. Methodology

The study focused on the properties of the fruit peel residues such as the lemon, pineapple and grapefruit peels to be developed into a bio-fermented cleaning product. The effectiveness of the cleaning agent was assessed using standard plate count and swab method.

3. Results & Discussion

The bio-fermented cleaning agent was developed using fruit peel residues from 3 types of fruits; pineapple, grapefruit and lemon. The results show that pineapple peel was the best treatment for a bio-fermented cleaning agent; it had good physical characteristics, milky white color, sour aroma of the fruit, and can be biodegradable. The pH, conductivity and the efficiency of the removal of stains of pineapple peel were 3.92±0.42, 152.19±6.53, and 91.78%, respectively. Next, grapefruit peel produced a brownish yellow colour, sour scent and partially degradable. The pH and conductivity were 3.65 ± 0.38 and 134.74±2.17 μS/cm respectively. The efficiency of removing stains of grapefruit peel was 89.28%. Finally, lemon peel had a light green colour, it had a floating ceiling on top and was the least effective. The pH, conductivity and the efficiency of the removal of stains of lemon peel were 3.63±0.31, 149.60±3.20 μS/cm and 79.10%, respectively. Pineapple peel produced the best result as it contains bromelain enzymes of decomposition proteins, which can reduce odor, eliminate fat stains, and kill germs more than grapefruit and lemon peels.

4. Conclusion

In summary, the efficiency of stain removal of the pineapple grapefruit and lemon peels were 91.78%, 89.28% and 79.10%, respectively indicating that pineapple peel residues are the best in the development of a bio-fermented cleaning agent.

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JACKFRUIT SEED STARCH-PVA BLEND BASED POLYMER ELECTROLYTE

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Keywords: Conductivity, Jackfruit seed starch, Polymer electrolytes, Polyvinyl alcohol.

1. Introduction

Polymer electrolyte (PE) is a crucial material for the development of modern electric devices such as high energy density batteries, sensors, fuel cells and electrochromic displays. The majority of PE is composed of non-degradable synthetic materials. This resulted in the contribution of electronic garbage (e-waste), which releases hazardous compounds into the atmosphere, impairing the ecosystem's sustainability. To mitigate the environmental impact of e-waste, biomaterials such as jackfruit seed starch (JSS) were used as the potential host for PE. Thus, the purpose of this work is to fabricate the jackfruit seed starch-polyvinyl alcohol (JSS-PVA) blend polymer electrolyte and determine its conductivity.

2. Methodology

JSS-PVA blend based polymer electrolyte was prepared using solution casting method. JSS-PVA with the ratio (5:5) mixed 6 wt% zinc oxide and 7 wt% polypropylene carbonate (PC) was prepared by using solution casting method. The sample conductivity was measured using an Agilent 4284a Precision LCR meter frequency range of 0.1Hz to 100 MHz.

3. Results & Discussion

The conductivity of fabricated sample is $8.95 \times 10^{-5} \, Scm^{-1}$. Conductivity was determined using formula 1.

$$\sigma = \frac{l}{R_b A} \qquad (1)$$
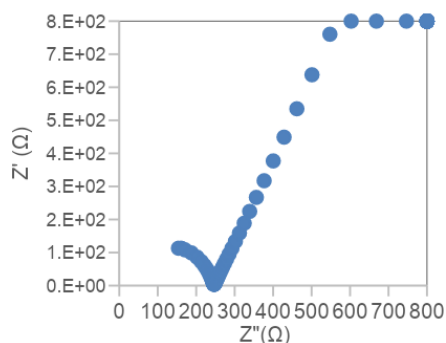
Figure 1. Cole-cole plot of JSS-PVA blend polymer electrolyte

where l is the electrolyte film thickness, R_b is the bulk resistance and A is the area of sample surface[1]. The R_b value obtained from the Cole-cole plot graph as Figure 1.

4. Conclusion

JFS-PVA blend polymer electrolyte was successfully fabricated, and the conductivity value is $8.95 \times 10^{-5} \, Scm^{-1}$

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HIGH CONDUCTIVITY OF POLYLACTIC ACID (PLA) BASED POLYMER ELECTROLYTE

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Keywords: Polylactic acid, Polymer electrolyte.

1. Introduction

Polylactic acid (PLA) has the potential to be a material for polymer electrolytes (PE) utilized in storage devices as sustainable, safe, and environmentally acceptable energy resources and is currently in high demand. The most important parameters for use in an energy storage device are strong ionic conductivity, and the current study discovered that the ionic conductivity of PE ranges from 10^{-8} to 10^{-3} Scm^{-1} [1]. The goal of these works is to fabricate the high conductivity of polylactic acid based polymer electrolyte (PLA-PE).

2. Methodology

High ionic conductivity PLA-PE was prepared using a solution casting method. The PLA was doped with 50 percent of lithium perchlorate ($LiClO_4$) and 300 percent of propylene carbonate (PC). Polymer electrolyte (PE) film was measured at room temperature $27°C$ using an Agilent 4284a Precision LCR meter frequency range of 0.1 Hz to 100 MHz. The reading data was analyzed using the Zive Smart Manager Software Version 6.54.

3. Results & Discussion

Figure 1 shows the Cole-cole plot of the PLA-$LiClO_4$-PC polymer electrolyte system. The value of the ionic conductivity was determined using equation 1.

$$\sigma = \frac{l}{R_b A} \quad (1)$$

where R_b is the bulk resistance, l is the thickness of the film, and A is the area of the sample [1]. At room temperature, the conductivity is 1.14×10^{-2} Sm^{-1}. The high conductivity of PLA-PE achieved as a result of the optimal amount of dopant $LiClO_4$ as the ionic ion in the PLA and PC as the plasticizer aids in the enhancement of ion interactions and the maximization of ion mobility.
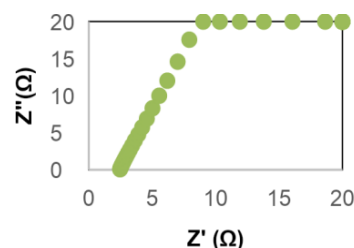
Figure 1. Cole- cole plot of PLA-PE

4. Conclusion

The high conductivity PLA-PE has the conductivity value of 1.14×10^{-2} Sm^{-1}.

Acknowledgments

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"MuzeAR" AN AUGMENTED REALITY ANDROID BASED APPLICATION FOR UNIVERSITAS AIRLANGGA HISTORY AND CULTURE MUSEUM COLLECTION

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1. Introduction

The museum is a tourist attraction as well as a place to store valuable archives and artistic works of the community regarding history [1]. The Airlangga University History and Culture Museum is one of the museum collections owned by Airlangga University which stores a collection of historical objects. The museum, located at the Faculty of Science and Culture, Airlangga University, also has a collection from Chinese civilization which has a high historical value and is also vulnerable if it has to be moved during exhibition. Due to these problems, MuzeAR gives an augmented reality experience for the museum visitors to view and study the collection without having to bring the collection to the exhibition.

2. Methodology

The application was developed using Agile Software Development Life Cycle (SDLC) method which has seven phases: (i) Literature Study of journals on Augmented Reality application development, (ii) Requirement Analysis about the software and hardware used for the project, (iii) System Design (UI storyboard and UML implementation), (iv) Implementation of the program (using Unity 3D and Vuforia SDK), (v) System Testing, (vi) System Deployment, Conclusions and Suggestions [2].

3. Results & Discussion

MuzeAR is an android-based application that gives an opportunity for the museum visitors to view and study museum collections. This application works by scanning the marker provided and then a 3D object will appear and a brief description of the object. Besides, this application provides a complete description such as the origin and history of the museum objects.

Figure 1. Product Demo

MuzeAR has been validated by media and material experts. The validation score is 93% by the media expert and 100% by the material expert. System testing was carried out by museum visitors represented by 10 information systems students and 10 historical students from Airlangga University, and obtained a score of 90%. MuzeAR has obtained a very good criterion value and is worthy of being used by the museum visitors.

4. Conclusion

MuzeAR can be an alternative medium in the introduction and learning of museum objects so that museum objects that are vulnerable do not have to be moved during exhibitions and MuzeAR can represent visual and written information of the museum objects.

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THE DEVELOPMENT OF BIODEGRADABLE STRAW FROM THE LOCAL WEED FOR COMMERCIALIZATION

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Keywords: Biodegradable straw, Environmental friendly products, Krajood.

1. Introduction

Krajood is a well-known weed that often causes wildfires in the peatland area of Narathiwat. It has a long and thin stem with a central hole which is interrupted by a number of membranes. The eradication of fine Krajood is achieved by transforming it to handicraft products. However, the rough part remains in the land as fuel. By removing the membranes and trimming of the rough Krajood to a specific length using simple home-made tools, we can produce biodegradable straws that can be commercialized. This will increase the income of the local people, promote sales of the manufacturer and reduce wildfire.

2. Methodology
2.1. Materials and Methods

The cutting jig (Figure 1) was simply made by assembling pieces of wood. It was equipped with a sharp dissecting blade which can trim a long Krajood to a fresh biodegradable straw. The straws then underwent the removal of the membranes using a standardized bamboo stick.

3. Results & Discussion

The length of fresh straws trimmed using the cutting jigs were 24 centimeters and their diameters were between 5-7 centimeters (Figure 2). After drying under sunlight, the straws became slightly shorter and narrower. The texture of some dried products were segmental which was undesirable to the manufacturer and customers.

Figure 1. Cutting jigs made from pieces of wood

Figure 2. Fresh straws (left) and dried straws (right)

4. Conclusion

The fresh and dried straws were trimmed using a cutting jig to meet the requirements of the manufacturer.

Acknowledgments

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DEVELOPMENT OF AUGMENTED REALITY MOBILE APPLICATION AS A LEARNING MEDIA FOR ANATOMY AND BLOOD CIRCULATION IN THE HUMAN HEART FOR JUNIOR HIGH SCHOOL

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1. Introduction

Learning the anatomy of the human heart among junior high school students is problematic due to the lack of appropriate learning media that can be used to visualize the heart. Currently, the way of teaching human heart anatomy and blood circulation is by using 2D pictures resulting in the difficulty to visualize the human heart. This study aims to develop an Android-based Augmented Reality (AR) application as a medium for learning the anatomy of the human heart and heart blood circulation.

2. Methodology

There were five phases in this research method; Requirement Analysis (Interview with junior high school science teacher and medical doctor), System design using waterfall method. System Implementation using UNITY 3D and Vuforia SDK, System testing using user acceptance testing.

3. Results & Discussion

AR for the human heart has two media; the first is the android application and the second is the QR code as a marker to show the human heart in 3D when the camera in the human heart app scans it as shown in Figure 1.

Figure 1. Product Demo

User evaluation using User Acceptance Testing was obtained through questionnaires distributed to 81 8th grade students of Junior High School 2, Jombang, Indonesia as shown in Figure 2.

Figure 2. User Acceptance Test Result

The result for the average percentage of suitability to task category is 88.09%. The result for the average percentage of self descriptiveness category is 87.45%. The average percentage of the controllability category is 87.04 %. The average percentage result for the suitability for learning category is 85.73%, which means that all four categories are included in the very good category.

4. Conclusion

The result of the overall system average is 87.07% which means the overall system is included in the very satisfied list based on the likert scale. From the result, we can conclude that AR Human Heart can help students in studying human heart anatomy and blood flow.

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VISION BASED RECYCLE WASTE DETECTION FOR REVERSE VENDING MACHINE USING YOLO BASED FRAMEWORK

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Keywords: Object detection, Recycle waste, RVM, YOLO.

1. Introduction

Reverse Vending Machine (RVM) is an interactive recycling platform that can identify the deposited recyclable items before providing a reward to the user [1]. In this project, a vision-based recycle waste detection system is proposed to detect three types of recyclable materials which are aluminum can, PET bottle and Tetra Pak, using You Only Look Once (YOLO)V5 framework [2] for the RVM usage.

2. Methodology

Sample images of the three recyclable items consisting of 7409 samples were self-collected and fed to the YOLO V5 framework. Hyper parameters were then rigorously tuned until the model achieved 0.995 mAP@0.5 accuracy. Eventually the optimal YOLO model was tested with a live feed webcam to analyze the real time detection performance.

3. Results & Discussion

The results of a live feed module assessment tested under several conditions are depicted in Table 1. It shows that the module was able to accurately detect the recyclable items except in low illumination where the accuracy achieved was only 22%. The sample of the detection process is shown in Figure 1.

Table 1. Result after the module has been tested under several conditions

Condition	Accuracy, %
Sequence 10 Class	90
Random Class	100
Moving Camera	100
Illumination	100

Figure 1. Sample result of the detection process for PET bottles, aluminum Can and Tetra Pak.

4. Conclusion

After the module has undergone various assessments under different conditions it can be concluded that the accuracy obtained is 97.5% with good illumination. In future, the performance can be improved by training the module with more sample sets.

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AIRLANGGA CARE FOOD WASTE: FOOD WASTE MANAGEMENT TO SUPPORT SDGs IN ELIMINATING HUNGER AND RESPONSIBLE CONSUMPTION AND PRODUCTION IN KOTA SURABAYA

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1. Introduction

The United Nations through the World Food and Agriculture Organization in 2013 has reported that 1.3 billion tons of food produced and fit for consumption became food waste. The amount of food waste was even worse at the beginning of the Covid-19 pandemic because food consumers for the restaurant and hotel sector fell by more than 60%. Surabaya has the potential to produce quality food both during normal and pandemic conditions considering that it has 276 hotels and 64 restaurants. Hotels and restaurants produce leftovers but not all are food waste. Therefore, in this study, a start-up service provider for processing leftovers was built named Airlangga Care Food Waste (ACFW). ACFW supports reducing the potential for food waste from the city of Surabaya with a food waste treatment system that distributes leftovers that are fit for consumption to 100 orphanages. In addition, unfit food is processed into compost and fodder intake for poultry in Sidoarjo Regency. So with the ACFW that supports the achievement of the second and twelfth SDG goals.

2. Methodology

This research used a literature review method that is a well-planned review which used database searches to retrieve results of the research, using a systematic and explicit methodology to identify, select, and critically evaluate results of the studies in the literature reviewed.

3. Results & Discussion

Surabaya has 276 hotels and 64 restaurants throughout the central, north, east, south, and west parts of Surabaya City which are sources of food waste. Hotels and restaurants in the city of Surabaya produce leftovers of 1072.49 kg/day and 217.56 kg/day, respectively [1]. However, 33% of them are still fit for consumption and the rest become waste [2]. The food waste reduction strategy proposed is that food waste that is still fit for consumption is distributed to orphanages throughout the city of Surabaya so that on average each orphanage gets 5.36 kg/day. Food waste can be processed by scavengers and areas in poverty so that they can produce an average of 657.59 kg/month of compost products and 2263.18 kg/month of animal feed.

4. Conclusion

The proposed food waste management is expected to support the second and twelfth SDG goals, which are zero hunger and responsible consumption and production in Surabaya.

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DEVELOPMENT OF THERAPY MACHINE FOR KNEE AND ELDERLY PATIENTS

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Keywords: Knee therapy machine, Motor drive, Stepping motor.

1. Introduction

Osteoarthritis is a common condition in the elderly and tends to increase steadily. Physical therapists spend a lot of time doing each physical activity. This sparked the idea and creation of a therapy device for knee and elderly patients for the purpose of reducing the physiotherapist's working time and increasing knee flexion range for early-onset and elderly patients.

2. Method

Figure 1 shows the therapeutic apparatus for knee and elderly patients that uses a stepping motor as a drive controlled by an Arduino. All moving steps will be displayed on the screen. The scope of this machine can be angled 4 levels 10, 40, 90,120 degrees and can support the weight of the patient's legs up to 20kg. It can also be adjusted according to the length of the patient's legs.

Figure 1. Therapeutic apparatus for knee and elderly patients

3. Results & Discussion

The result of the motion angle of the therapy machine can be obtained by comparing the degree values measured with the degree measured by the goniometer as in Table 1.

Table 1. Comparison of the angle obtained from the therapeutic machine

Angle measured from the machine (degress)	The angle measured by the goniometer (degress)					Average	Standard Deviation
	1st	2nd	3rd	4th	5th		
10	10	10	10	10	10	10.00	0.000
20	20	20	19	20	20	19.80	0.447
30	30	30	29	30	30	29.80	0.447
40	41	39	40	40	40	40.00	0.707
60	60	59	59	61	60	59.80	0.836
90	90	90	89	91	90	90.00	0.707
100	100	99	101	102	98	100.00	1.581
120	120	121	118	119	120	119.60	1.140

4. Conclusion

The therapy machine for knee and elderly patients can help increase the degree of stretching and bending of the patient's legs. It also reduces time for physiotherapists and reduces the cost of importing expensive medical devices. This machine can work faster than conventional methods that are being used by physical therapists.

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3D (THREE-DIMENSIONAL) LUNG CANCER DETECTION AND IDENTIFICATION BASED ON MIXED REALITY

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Keywords: Lung cancer, 3D, Mixed reality.

1. Introduction

Based on data from the Global cancer statistics (Globocan) 2020, deaths due to lung cancer in Indonesia increased to 30,843 people with new cases reaching 34,783 cases [1]. In the treatment of lung cancer, it is necessary to observe with imaging to support the diagnosis by doctors and the imaging modality that is most frequently used is CT scan. However, the results from the CT scan are still two-dimensional and the cancer will be analyzed manually by the doctor. If the doctor is tired, it can cause misinterpretation which will affect the treatment actions taken. Therefore, to streamline observation time and increase the accuracy of the cancer picture on the patient's body so that doctors can more accurately plan treatment actions, a mixed reality CT scan was developed. The innovation of CT scan using 3D based on mixed reality can produce more detailed and accurate cancer images, making it easier for doctors to find out the location of cancer during observation.

2. Methodology

The methodologies related to Three-Dimensional (3D) Lung Cancer Detection and Identification in sequence were collecting data retrieval from CT Scan, lung cancer segmentation, algorithm 3D image processing, and analyzing visual results of lung cancer with Mixed Reality Headset.

3. Results & Discussion

Figure 1. Lung cancer analysis process using Mixed Reality

This CT scan uses a 3D algorithm for the cancer detection process and interprets cancer more realistically based on mixed reality technology. The innovation of CT scan using 3D based on mixed reality can produce more detailed and accurate lung cancer images, making it easier for doctors to find out the location of cancer during observation.

4. Conclusion

3D lung cancer detection and identification based on mixed reality aims to improve the accuracy of early detection and identification of cancer, hence making it easier for doctors to analyze lung cancer, make medical decisions, and describe medical conditions to patients.

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CONTINUOUS PASSIVE MOTION THERAPY DEVICE FOR ELBOW PARALYZED AND POST TOTAL ELBOW ARTHROPLASTY PATIENT

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1. Introduction

Ulnar nerve palsy may occur after coronoid fixation. This is partly due to dissection and treatment of nerves during surgery and partly due to trauma sequelae (swelling, scarring, callus formation, contractures). The development of ulnar nerve palsy usually leads to a setback in the patient's rehabilitation, including reduced elbow movement and increased pain [1]. Total Elbow Arthroplasty (TEA) is a common surgical procedure used in the management of advanced, post-traumatic rheumatoid arthritis, osteoarthritis, and irreparable fractures in elderly patients [2]. Patients from this clinical treatment will experience difficulty in moving their elbows, therefore a device is needed that can train elbow movements so that the elbows are not passive during the healing process. In helping to improve the movement of the body's joints, medical robotics plays an important role not only in assistance, but also in rehabilitation and therapy.

2. Methodology

Training will be provided according to the postoperative period. The longer the time frame, the more repetitions and speed gains will be made.
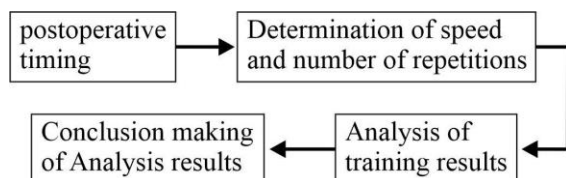
3. Results & Discussion

By doing passive motion exercises continuously, it is hoped that the patient's elbow can get used to movements that are in accordance with the Range of Motion (ROM).

4. Conclusion

Continuous Passive Motion (CPM) Therapy is performed with the help of a 1-DOF robotic arm and is based on training carried out by expert therapists. This will make it easier for patients because they can do training without having to go to the hospital or to a therapy center.

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BIOMASS DOWNDRAFT GASIFIER SYSTEMS AS SOLUTION FOR GENERATING ELECTRICITY

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Keywords: Biomass, Electric, Gasification, Syngas.

1. Introduction

Biomass is a collection of organic and inorganic materials mostly consisting of bi-products and wastes from agriculture. Meanwhile there are large amounts of various biomass as a renewable energy source in Indonesia. Biomass conversion to electricity particularly for rural areas gets much attention at this moment. A common technique for the conversion of biomass to electrical energy is steam power plants. One of the technologies involved in energy production using biomass is gasification. Gasification is the process of converting carbon-containing compounds to change both liquid and solid materials into flammable gases (Syngas). The gaseous fuel from biomass gasification might reduce the consumption of diesel.

2. Methodology

This research used a downdraft type gasifier to produce syngas. At this stage the fuel prepared was biomass like coconut shell. The material was cut into the size of 6x6cm with a mass of 10 kg for combustion. The combustion process was carried out until a gas that can be burned or has a temperature of around 800°C was produced. Syngas produced before testing the composition with a gas detector BH-4S Portable Multi-gas Detector.

3. Results & Discussion

Characteristics of gasification tests using biomass are reported in Table 1.

Table 1. Characteristics of gasification tests

Composition	Volume (vol%)
H_2	11.4
CO	21
CH_4	5.5
C_2H_4	0.15
C_2H_6	1.33
CO_2	18.6
N_2	42.6

The table shows the optimal syngas composition for RCCI (Reactivity controlled compression ignition) diesel combustion.

4. Conclusion

The syngas composition which can drive an electric motor is H_2, CO, CH_4, C_2H_4, C_2H_6, CO_2, and N_2, each of which measures 11.4%, 21%, 5.5%, 0.15%, 1.33%, 18.6%., and 42.6% with a power output of 5 kW.

Acknowledgments

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A SMART HYDROPONIC SYSTEM USING INTERNET OF THING (IoT)

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Keywords: Internet of Things (IoT), Smart hydroponic system, Thing speak platform.

1. Introduction

The Movement Control Order (MCO) enforced by the government during COVID-19 pandemic stops farmers from going to their hydroponic farms as usual. Because of this, this project aims to develop a Smart Hydroponic System using Deep Flow Technique (DFT) hydroponic system. This smart system uses Internet of Things (IoTs) technology.

2. Methodology

The main part of the smart hydroponic system is the DFT hydroponic set itself, which is available in the market. Sensors such as Total Dissolved Solids (TDS) meter, pH sensor, DS18B20 temperature sensor and DHT22 are connected to the TTGO LoRa ESP32 transceiver. The collected sensor data are transmitted using LoRa communication to the LoRa base station, which is connected to the internet via Wi-Fi. This internet connectivity allows the sensor data to be stored on the Thing Speak as the cloud platform. Next, the sensor data can be retrieved using a developed mobile app that allows farmers to view it using their smartphone. Figure 1 shows the overall architecture of the developed smart hydroponic system.
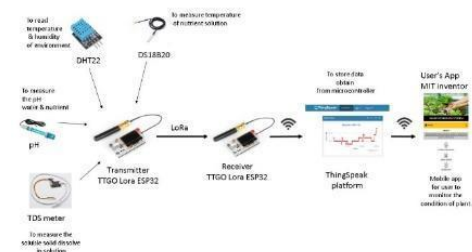
Figure 1. Overall architecture of the smart hydroponic system

3. Results & Discussion

Figure 2 shows the collected sensor data that are displayed on the developed mobile app.

Figure 2. The collected sensor data are displayed on the developed app

4. Conclusion

The Smart Hydroponic System uses Internet of Things (IoTs) technology that allows farmers to still monitor their farms from home during MCO.

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LORACRN: IMPLEMENTING A COGNITIVE RADIO NETWORK TESTBED BASED ON LORA WIRELESS TECHNOLOGY USING RASPBERRY PI

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Keywords: Cognitive Radio, Internet of Things, LoRa, LPWAN, Raspberry pi.

1. Introduction

Connecting IoTs on the platform of Low-Power Wide Area Network (LPWAN) allows long distance transmission with efficient power utilization [1][2]. Unfortunately, more connections in wireless applications and devices lead to network congestion. In addition, unbalanced spectrum utilization may arise due to the current fixed spectrum assignments. Thus, implementing a Cognitive Radio Network (CRN) testbed on LoRa network to evaluate network performance is presented in this paper. This allows further analysis from the findings. Therefore, the problem stated can be evaluated and analysis results for CRN network on LoRa network can be improved for better network performance.

2. Methodology

LoRaCRN is composed of LoRa end devices, a gateway, The Things Stack server, user web application and a laptop as the monitoring device. Figure 1 shows the topology where nodes are configured and developed on the LPWAN platform using Python. The gateway relay messages between end-devices and application server; and then Things Speak captures and analyzes the data that allows a single-hop link communication. Based on the analysis, the network topology will be improved in terms of distance, power used, as well as spectrum utilization.
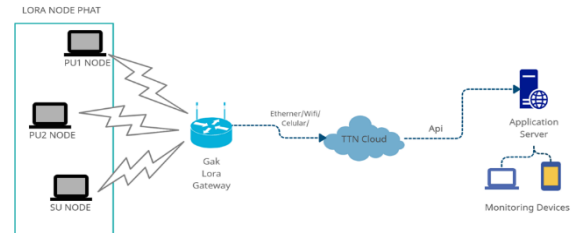
Figure 1. LoRaCRN Implementation

3. Results & Discussion

The network connectivity test among each device was successful which confirmed that the network system was functional. Data transferred among the secondary user can be monitored in terms of routing efficiency and end-to-end delay.

4. Conclusion

LoRaCRN can easily be set up and can be implemented with a single or multiple LoRa gateway that is able to utilize the same or different channels according to the selected frequencies.

Acknowledgments

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USING SELECTED PROBIOTIC AS A STARTER CULTURE FOR FERMENTED RICE SAUSAGE IN YALA CITY, THAILAND

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1. Introduction

Starter cultures are individual selected strains when different concentrations were added to the fermented feed product, giving it a unique appearance [1]. This concept was applied to improve the process of producing traditional fermented rice sausage. The use of probiotic lactic acid bacteria as a starter culture could be described as viable cells that are able to multiply themselves inside fermented rice sausage products, increasing their controlling, hygienic safety, improving quality and consumer acceptability.

2. Methodology

Preparation of Probiotic lactic acid bacteria [2]. 1%v/w (10^6 CFU/ml) of inoculum was added to rice sausages. Develop rice sausage products using starter culture compare 1% v/w of AJ11 and AJ31(selected probiotic). Sensory test of product by 30 people; Sensory evaluation was performed using on a hedonic 5-point scale [3].

3. Results & Discussion

The development of the isolates of the two isolates showed that the cultures had a good ability to produce lactic acid resulting in a lower pH and a sour product (Table 1).

Table 1: pH of AJ11 and AJ31

Time (hr.)	pH	
	AJ 11	AJ31
0	7.40±0.10	7.26±0.12
24	4.84±0.11	4.57±0.21
48	4.56±0.01	4.28±0.10
72	4.23±0.01	4.10±0.12

Sensory testing of fermented rice sausage in terms of general characteristics, color, odor, flavor and texture found that there is a preference for AJ11 over AJ31 because AJ31 was too sour and AJ11 tasted good. (Figure 1)

Figure 1. Sensory test

4. Conclusion

Developing rice sausage products using starter culture with 1% v/w of AJ11 that are able to multiply themselves inside fermented rice sausage products results in good taste and is accepted by consumers.

Acknowledgments

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REFRESHEDGE: A SMART DEVICE FOR ASSESSING MANGO FRESHNESS

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1. Introduction

Mango quality varies almost daily, and it is impossible for the consumer to determine during purchase. As a result, it is critical to correlate all major quality parameters in such a way that the fruit's size, shape, colour, and aroma reveal the fruit's overall quality [1]. Mango farmers rely on unskilled manual labour to sort the mangoes' quality, which is frequently unreliable and prone to errors [2]. Therefore, this project was created to demonstrate the feasibility of automated mango sorting based on its skin color. The project is heavily influenced by the philosophy of smart farming and makes use of Deep Learning to visually differentiate mango quality

2. Methodology

The project implemented Deep Convolutional Neural Network based on MobileNet on Embedded computing to perform automatic mango quality classification.

3. Results & Discussion

The resulting prototype as depicted in Figure 1 can distinguish between fresh and non-fresh mango with an accuracy of 87 percent when subjected to varying lighting conditions.
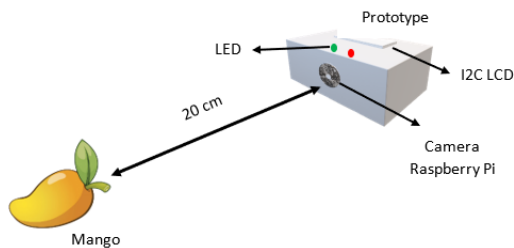
Figure 1. Prototype of ReFreshEdge

4. Conclusion

ReFreshEdge has great potential to be further developed to include other mango quality parameters not limited to size, shape, and weight.

Acknowledgments

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DRESS4CLASS: DRESS CODE CLASSIFICATION SYSTEM

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Keywords: Dress code, Dress code enforcement, Deep learning, Edge computing, Smart device.
.

1. Introduction
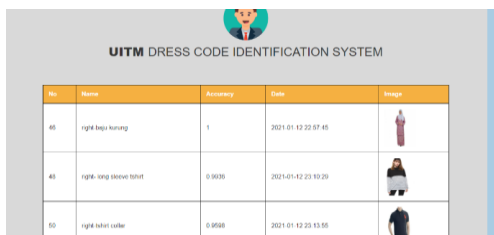
The student dress code has always been a point of contention in the university. From the management perspective, instilling proper dress code promotes a sense of formality and communicates professional appearance among students [1]. However, some students flaunt dress code rules and wear clothing which is in opposition to the university's spirit [2]. Enforcing the dress code manually takes a lot of effort as there are many students to monitor. Therefore, to overcome this problem, we have proposed to develop a smart device which can identify students who are not wearing proper dress code.

2. Methodology

The project implements Deep Convolutional Neural Network based on MobileNet on Embedded computing to perform automatic dress code identification using active scanning with camera.

3. Results & Discussion

The resulting prototype can distinguish between proper or improper clothing articles worn by students with 96.7% accuracy on a validation dataset. Figure 1 depicted the Dress Code Classification system displaying the result of camera scans.

Figure 1. User interface of the Dress Code Classification System.

4. Conclusion

The initial Dress4Class prototype has shown promising results as it is able to distinguish between a person who is adhering to the dress code and those who do not. Future work of the project should concentrate on expanding the dataset and field-testing the device outside of lab conditions.

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S-CalmMind: A SMART MOBILE STRESS INTERVENTION FOR STUDENTS USING PRINCIPLES OF CALM TECHNOLOGY

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Keywords: Pulse Sensor, Mobile application, Stress Intervention.

1. Introduction

Academic stress is the most prevalent mental stressor or behavioural disorder encountered by students during their studies. According to Fairbrother and Warn (2003) as cited in [1], college is the primary source of stress for students. Therefore, overcoming the problem using a technological approach is essential as most of the students often experience stress. A Smart Mobile Stress Intervention for Students using the Principles of Calm Technology (S-CalmMind) application focuses on easing the stress experienced by students by emitting calm sounds such as zikr once a higher heartbeat was detected by the pulse sensor.

2. Methodology

This study adapted and simplified System Development Life Cycle methodology into a three-phase Model in designing and developing the system. The three phases were analysis, development, and evaluation. Each phase carried specific activities to accomplish the aim of this study and successfully delivered the Smart Mobile Stress Intervention for Students.

3. Results & Discussion

Figure 1 summarizes the findings from the user acceptance test (UAT) conducted with undergraduate students. The overall mean for each question was used to analyse each of the criteria. The results indicate positive acceptance with a 4.94 mean score for perceived usefulness, respondents strongly agreed that this mobile application is easy to use and useful as a stress intervention for students.
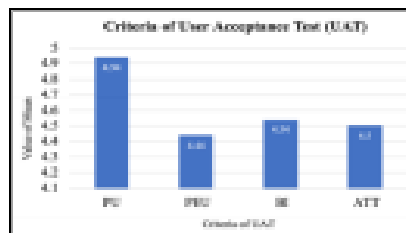
Figure 1 Result of Criteria for UAT with Students

4. Conclusion

In conclusion, S-CalmMind is acceptable as a stress intervention app as the majority of the respondents believed that it is extremely beneficial to assist students in calming the mind. The app suggests a zikr audio once S-CalmMind detects the presence of stressful moments. This app also benefits the communities who are always under stress.

Acknowledgments

Reference

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A TIME SERIES ANALYSIS ON PERFORMANCE TOWARDS THE FOOD, BEVERAGES AND TOBACCO MANUFACTURING IN MALAYSIA

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1. Introduction

The food, beverages and tobacco manufacturing industry is one of the main sectors contributing to Industry Revolution 4.0 and the economy in Malaysia [1]. The manufacturing industry performance could be affected for a long time due to the COVID-19 pandemic outbreak and the implementation of the Movement Control Order (MCO). This study aimed to perform a time series analysis on the future performance of the food, beverages and tobacco manufacturing in Malaysia.

2. Methodology

Three performance indicators which are the manufacturing sales value, number of employees engaged and salaries paid in the food, beverages and tobacco manufacturing were used in the analysis. These data were time-series data from January 2019 to October 2020 and collected from the official website of the Department of Statistics Malaysia. Autoregressive Integrated Moving Average (ARIMA) and time series regression were used to predict the sales value based on the other indicators from November 2020 to December 2021. All analysis was performed by using R version 4.0.2.

3. Results & Discussion

All indicator time series data were transformed by second differencing to achieve time series stationary. Among all possible ARIMA error models for the time series regression, ARIMA(0,2,1) reveals the lowest AICc value which is 364.78 and used to fit the time series regression model. Figure 1, shows the forecast of the sales value from November 2020 to December 2021. It is expected the future sales value is increasing and mainly influenced by salaries and wages paid in the manufacturing sector.
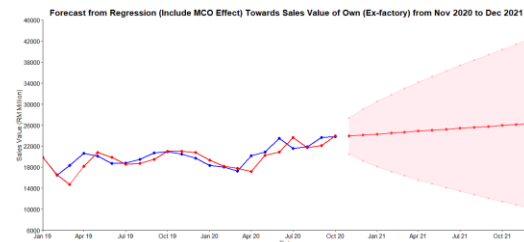
Figure 1. Forecast of Sales Value

4. Conclusion

The future sales value of the food, beverages and tobacco manufacturing industry in Malaysia would be expected to increase despite the implementation of MCO during the COVID-19 pandemic.

Acknowledgments

Reference

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CR-COVID-19: DEVELOPMENT OF COUGH RECOGNITION FOR COVID-19 USING AN EDGE DEVICE

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1. Introduction

COVID-19 has infected millions of people worldwide. One of the major clinical symptoms of COVID-19 is dry cough [1]. Cough, one of the noticeable early COVID-19 symptoms, provides an opportunity for better diagnosis since the current conventional test (rRT-PCR) has flaws in terms of result wait time and cost. Thus, this research intends to promote a computer-aided medical diagnostic tool for COVID-19 through the cough recognition technique.

2. Methodology

The research methodology used in developing a model of cough recognition for COVID-19 (CR-COVID-19) involved three phases, which are Project Initiation, Design and Development, and Evaluation. The tasks for each phase are listed as shown in Figure 1.
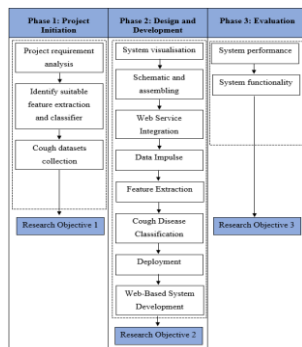
Figure 1. Cough Recognition for COVID-19

3. Results & Discussion

The main objective of this research is to detect people who are with COVID-19 cough by using the cough recognition technique. Therefore, the accuracy of this system in detecting cough diseases class is presented in the confusion matrix table as shown in Table 1.

Table 1. Confusion Matrix of System Performance Testing of CR-COVID-19

Class	Accuracy (%)	Uncertain (%)
Normal	73.20%	15.10%
Positive	73.00%	17.70%

4. Conclusion

In conclusion, the CR-COVID-19 development has managed to achieve an overall accuracy of 73.08%. Nevertheless, the system performance can be improved by using an SVM classifier for a more accurate result.

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HYPERSPECTRAL AND LiDAR (HYPERLiD) FOR SPECIES RECOGNITION, ABOVE-GROUND BIOMASS AND CARBON STOCK ESTIMATION

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Keywords: Above-ground biomass (AGB), Carbon stock, Hyperspectral, LiDAR, OBIA.

1. Introduction

The increase in the earth's temperature is due to the destruction of forests with many tree species caused by irresponsible groups. Therefore, this problem must be addressed immediately by identifying endangered tree species and identifying forest health levels by estimating above-ground biomass (AGB) and carbon stocks. This innovation uses remote sensing technology and hyperspectral imagery with LiDAR point cloud to identify tree species and estimate AGB and carbon stock in tropical rainforests.

2. Methodology

Object-based image analysis (OBIA) method with two classifiers (random forest & support vector machine) was used to classify tree species and LiDAR was used to extract the crown projection area (CPA) and tree height to estimate AGB and carbon stock.

2.1. Equations

The equation developed by [1] was used to estimate AGB and carbon stock:

$$\ln\ln S_c = -5.963 + 3.130\ln\ln h_L + 0.524\ln\ln CPA \quad (1)$$

$$\ln\ln S_c = -4.022 + 0.870\ln\ln h_F + 2.026\ln\ln DBH \quad (2)$$

3. Results & Discussion
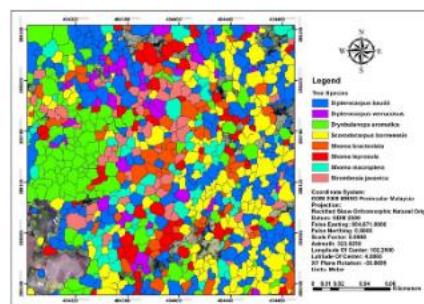
Figure 1. Tree species map

Table 1. Total AGB and carbon stock in study area

Above-ground biomass (AGB)	Carbon stock
317.641 t/ha^{-1}	172.892 t/ha^{-1}

4. Conclusion

Using this combined innovation between LiDAR and hyperspectral can save time, cost, and workforce to identify tree species and estimate AGB and carbon stocks at the large area in a tropical rainforest.

Reference

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IoT-ML: WATER QUALITY MONITORING SYSTEM

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Keywords: Artificial neural network, Internet of Things, Monitoring system, Smart system, Water pollution.

1. Introduction

The standard method of water quality monitoring is no longer completely trustworthy, necessitating a manual study by scientists [1]. As a result, it poses several health concerns, including skin issues. To address the issue, this research offers an automated monitoring system based on IoT and Artificial Neural Networks (ANN). This system will use a combination of sensors and a Telegram Bot to monitor the water quality, which will be fed into an ANN prediction of contamination.

2. Methodology

The project uses IoT and Artificial Neural Networks to create an automated monitoring system (ANN). The system will use a series of sensors to monitor the water quality and use machine learning to anticipate pollution. By utilizing the system Telegram Bot users are able to check the quality status in real-time and get alert notifications.

3. Results & Discussion

The resultant prototype uses dashboard view to provide users with real-time updates on the cloud platform. The system displays the current state of each parameter, such as pH, Turbidity, and the water's status based on the measurement. Also, users can use the Telegram Bot to directly monitor the system, for example, by opening it on their smartphones. These data will also be included into the AAN prediction model. Figure 1 shows the dashboard view in Thinger.IO for real-time system monitoring.
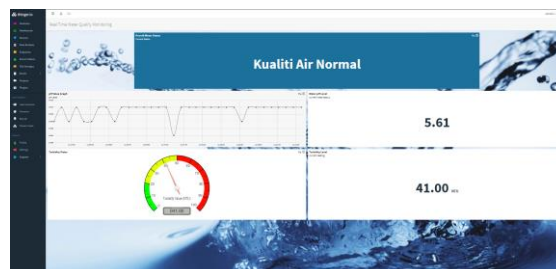
Figure 1. Dashboard view in Thinger.IO

4. Conclusion

In conclusion, this project proposed using IoT technology and an Artificial Neural Network to monitor water quality in real-time. Users can check the current water quality using the Telegram Bot, which provides a daily update on the water they consume, perhaps saving them from drinking contaminated water. This method is anticipated to benefit all people, particularly those who live in rural areas where rivers are still their primary source of water. As a consequence, our health will be improved, we will be more environmentally conscious, and able to utilise clean water daily.

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PYTHON-BASED: SELF-DIAGNOSIS OF DIABETES DISEASE USING FUZZY EXPERT SYSTEMS

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Keywords: Diabetes, Diabetes diagnosis, Diabetes prediction, Fuzzy expert system, Python, Rule based.

1. Introduction

In Malaysia, an estimated 3.9 million individuals aged from 18 and above have diabetes; an increase from 3.5 million in 2015 [1]. As a result, it is worthwhile to introduce the diabetes diagnosis system in order to address this problem. It is a rule-based program based on a fuzzy expert system that gives expert advice such as decisions, recommendations, or solutions to the end users/patients. This system can also be used to replace the need for patients to visit or schedule an appointment with a doctor because they may be able to diagnose themselves. This system contributes to the construction of complex medical applications utilizing the Python programming language, notably in the case of diabetes.

2. Methodology

To conduct self-diagnosis of diabetic disease, the project employed a Fuzzy Expert system that programmed on the Python computer language. Random blood glucose, fasting blood glucose, rapid weight loss, polyphagia, dizziness, tiredness, and impaired vision were the nine symptoms used to make the diagnosis. The output of this system included diabetic illness stage, suggestions, and remedies.

3. Results & Discussion

The prototype shows the diagnosis outcome based on nine patient inputs. Figure 1 shows the Diabetes Diagnosis system presenting the Fuzzy Expert system's output.
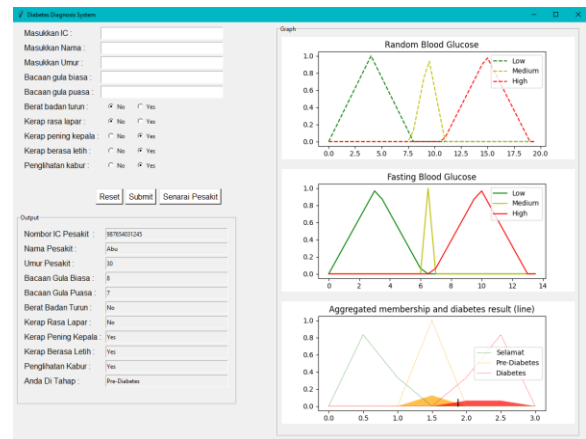
Figure 1. User interface of the Diabetes Diagnosis System.

4. Conclusion

Finally, using Python programming, this project offers a self-diagnosis of diabetes disease. The Diabetes Diagnosis prototype has demonstrated promising results based on the present research, as it can diagnose a person's diabetes state based on the nine symptoms obtained from them.

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MODELLING OF STANDARD PENETRATION TEST VALUE ESTIMATION BASED ON THE SOIL PROPERTIES

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1. Introduction

The Standard Penetration Test (SPT) is a complex in-situ penetration test designed to provide information about geotechnical properties of soils and to obtain the standard penetration resistance, generally called the N-Value. SPT measures the penetration resistance provided by soil at different depths and is used in several empirical geotechnical engineering formulas [1]. However, the SPT is difficult to carry out in a swampy and peaty area where the soils have high organic content, inaccessible by vehicle and generally waterlogged. In order to discard SPT due to time constraint and budget limitation, a model using MINITAB 14 was used to estimate the soil properties in a preliminary analysis before designing any structure and also can predict the soil properties in the desired depth of soils.

2. Methodology

The interpretation of soil data from the soil investigation report was carried out to obtain the subsoil engineering characteristics and physical properties of soils. The correlation of SPT N-Value with soil properties was derived from the result of N value from SPT and the data gathered from soil laboratory testing. The correlation between SPT Value and soil properties parameters were analysed using MINITAB 14. From these analyses, modelling for the prediction of SPT was successfully analysed. Response Surface Methodology was required to test all of the variable's evaluation and make the laboratory test stage more efficient.

3. Results & Discussion

The present correlations as shown in Figure 1, can be used as a prediction of soil properties value in desired depth of soil.

Sample No.	Depth		Particle Size Distribution, %				Soil Classification
	From	To	Gravel, > 2 mm	Sand, 0.06 – 2 mm	Silt, < 0.06 mm	CLAY	
D1	6	6.45	0	1	37	63	Sandy CLAY
D2	7.5	7.95	0	2	36	62	Sandy CLAY
UD2	9.5	10.5	0	3	37	60	Sandy CLAY
D5	12	12.45	0	5	35	60	Sandy CLAY
UD3	15.5	16.5	0	16	34	50	Sandy CLAY
D8	18	18.45	0	6	35	59	Sandy CLAY
D10	21	21.45	0	8	35	58	Sandy CLAY
D12	24	24.14	17	25	37	21	Sandy SILT
D15	30	30.06	29	27	30	14	Sandy SILT

Figure 1. Composition and Classification of Soil Data.

4. Conclusion

The development of a new model for SPT in the prediction of soil properties value at different depths.

Reference

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A MODELLING OF SOFT SOIL BASED ON ELECTRICAL RESISTIVITY WITH REGARD TO MOISTURE CONTENT

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1. Introduction

Construction on the soft ground often gives rise to several geotechnical issues especially that are related to strength and moisture content [1]. To overcome these problems an attractive geophysical technique Electrical resistivity method (ERM) is suitable for subsurface profile characterization over a larger area [2]. The current study focused mainly on the geophysical method where the main objective was to develop a model's resistivity to estimate moisture content for three (3) different construction sites using MINITAB 14 software based on electrical resistivity results obtained. This approach is considered useful in assisting the design engineer in arriving at a satisfactory estimation on shear strength of subsoil based on soil moisture in existence.

2. Methodology

The study began with a review through soil properties data obtained from soil investigation reports and followed by a desktop study. This ensured that all relevant information pertaining to subsoil conditions in different site studies were compiled and collated. Then on this basis, the relationship between theoretically predicted subsurface parameters with those observed at the site was established. In addition, all the data obtained were analysed using MINITAB 14.

3. Results & Discussion

Figure 1 shows that electrical resistivity (R) is directly proportional to soil moisture content (w) i.e., $R\alpha w$ where peak electrical resistivity coincides with the highest soil moisture content determined.
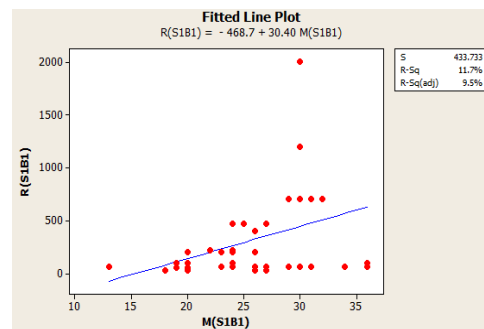
Figure 1. Resistivity vs moisture content

4. Conclusion

The new model Electrical Resistivity significantly influenced by the moisture content of the soil is successfully established.

References

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DESIGNING OF MICROWAVE METAMATERIAL BIOSENSOR FOR WATER POLLUTION MONITORING

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Keywords: Dielectric constant, Metamaterials, Microstrip ring resonator, Microwave, Sensing, S21 parameter.

1. Introduction

Metamaterials (MTMs) as engineering materials are well known for their negative refractive index and near-zero relative complex permittivity [1]. In this paper, a resonator will be developed as a biosensor based on the most commonly used topology of MTMs, which is Microstrip Ring Resonator (MRRs). MRRs is used to determine microwave substrate properties such as permittivity and loss tangent [2]. The principle of MTM sensors for detecting materials is based on the changes in the resonant frequency by the effect of dielectric characteristics.

2. Methodology

2.1. Equations

The width of the microstrip line, effective dielectric constant, and the mean radius of the ring resonator are based on Equation (1), (2), and (3), respectively.

$$w = \frac{v_0}{2 f_r} \sqrt{\frac{2}{\varepsilon_r + 1}} \tag{1}$$

$$\varepsilon_{reff} = \frac{\varepsilon_r + 1}{2} + \frac{\varepsilon_r - 1}{2} [1 + 12 \frac{h}{w}]^{-\frac{1}{2}} \tag{2}$$

$$r = \frac{nc}{2\pi f_r \sqrt{\varepsilon_{reff}}} \tag{3}$$

3. Results & Discussion

The proposed microstrip ring resonator was fabricated. The transmission coefficient response of the resonator was observed with different materials under test, as shown in Figure 1.
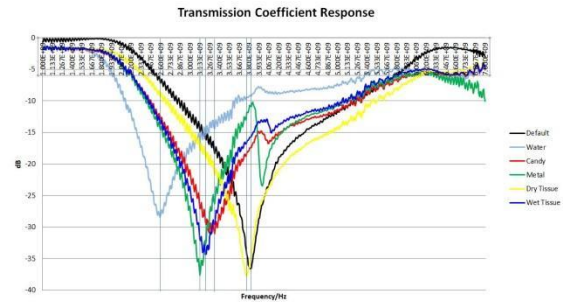
Figure 1. Transmission coefficient response, S_{21} of different MUTs.

4. Conclusion

The fabricated microstrip ring resonator has distinguished each MUT by shifting resonant frequency. In future work, the metamaterial-based microstrip ring resonator could be used to predict residue in our clean water to minimise the risk of drinking polluted water.

Acknowledgments

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ADHIKARI – AUTOMATIC RICE DRYER TECHNOLOGY BASED ON THE INTERNET OF THINGS (IOT) TO OPTIMIZE AGRICULTURAL RESOURCES IN COVID-19 PANDEMIC TIME

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Keywords: ADHIKARI, Agricultural, Dryer, IoT, Rice.

1. Introduction

The Covid-19 pandemic has affected the economic sector in Indonesia. One of the ways to withstand the damage due to the Covid-19 pandemic is by enhancing the agricultural sector. The evidence found from the data released by BPS (2020) shows that the contribution of the agricultural sector to the national Gross Domestic Product (GDP) has increased amid the economic contraction in the second quarter of 2020. This condition should be maximized to strengthen the agricultural sector as an effort to recover the national economy. The agricultural sector is strongly influenced by the technology of processing products such as drying food products. Therefore, we have developed a food drying technology that focuses on reserving all kinds of grains including rice. The product is called the ADHIKARI.

2. Methodology

ADHIKARI was developed using the Research and Development (R&D) method. The R&D method is used to produce a specific product and test the effectiveness of the product.

3. Results & Discussion

ADHIKARI works by using a heater as the main system of this product. The heater sensor is the main machine input, namely the temperature sensor.

Table 1. Water Content in 100 Kg Rice Using Grain & Seed Moisture Tester

	Type	Temperature	Time	Humidity
1	Conventional	25°C - 35°C	8 h	23,5 %
2	ADHIKARI	50°C	5 h	13,1 %

The rice sample used in each experiment; the sun or using ADHIKARI, was 100 kg. The drying temperature using sunlight was more uncertain, which ranged from 25°C to 35°C. Conventional drying was carried out at 8 AM – 4 PM, and after being tested using the Grain and Seed Moisture Tester it was still around 23.5%.

4. Conclusion

ADHIKARI is expected to encourage the agricultural sector as well in optimizing rice productivity to support SDG 2040.

Acknowledgments

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AL-FURQAN ISLAMIC BOARDING SCHOOL PROMOTION USING AUGMENTED REALITY

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1. Introduction

Al-Furqan Islamic Boarding School was founded in 1986. Augmented Reality is a technology that allows people to visualize the virtual world as part of the real world, i.e. making the virtual world as if they can connect to the virtual world and interaction can occur [1]. By promoting the Al-Furqan Islamic Boarding School using Augmented Reality technology, prospective students can find out the description of the classrooms, dormitories and the outside environment of the Al Furqan Islamic Boarding School.

2. Methodology

2.1. Data Collection

The data taken were in the forms of information and objects of the male and female students' dormitory buildings, classes, and prayer rooms.

2.2. Making 3D Object

3D objects were created using the Blender application which consists of 2 stages; making objects and giving textures or colors.

2.3. Making User Interface

User interfaces were developed using the unity application with the markerless AR Core library techniques. The finished 3D objects were imported into the unity application and built into an application so that it can run on android.

3. Results & Discussion

The stages of making the 3D object of the mosque building are shown in Figure 1.

(a)   (b)   (c)
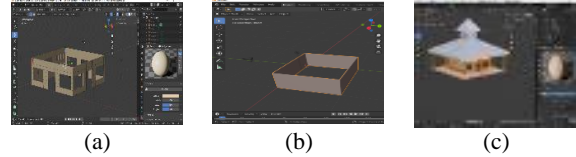
Figure 1. (a) Making object, (b) Coloring 3D Objects, (c) View of the 3D object of the mosque building

The development of user interfaces is shown in Figure 2.

(a)   (b)
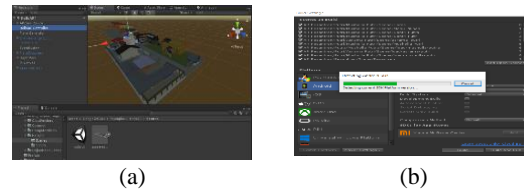
Figure 2. (a) 3D objects are imported into the unity application, (b) Build process to application

The overall view of the building object is shown in Figure 3.

Figure 3. View of the building object

4. Conclusion

The Al Furqan Islamic boarding school promotion application was successfully developed, it is recommended to add a view in the form of a Point of View (POV).

Reference

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MODELLING OF SOFT SOIL REINFORCED WITH INFILLED PREFABRICATED VERTICAL DRAIN (IPVD)

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1. Introduction

Construction on soft soil with low permeability will induce prolonged consolidation settlement to occur. Massive settlement of the soil foundation also is a vast problematic issue. Prefabricated Vertical Drains (PVD) have been widely used in Malaysia for an acceleration of the consolidation. However, the usage of the vertical drain does not reduce the total settlement. Geosynthetic encased stone columns have been found to shorten the time required for consolidation settlement [1]. The application of infilled encased small circular vertical drain introduced in this study is a state-of-the-art for the ground improvement method.

2. Methodology

A modified Rowe Cell test was set up to predict the settlement and stress distribution of reinforced soft soil with two different column conditions: sand column (SC) and encased sand column (ESC) aka infilled PVD. The test also determined the radial consolidation process around the composite vertical drain (column) in soft soil. The results were verified with finite element analysis using Plaxis 2D.

3. Results & Discussion

Results show that the effective vertical stress concentrated is higher in the column than in the surrounding soft soil. The vertical stress of surrounded soft soil is reduced when the distance approaches towards the outer layer.

For the settlement of the composite structures, it is also proven that infilled PVD (iPVD) has the lowest and faster settlement compared to stone column (SC).
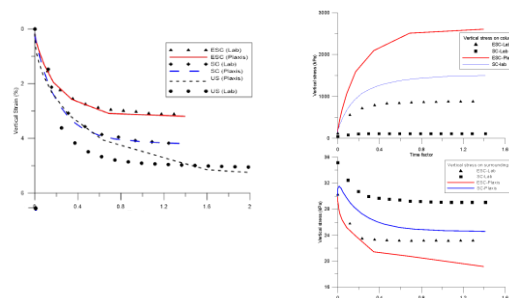
Figure 1. Settlement and vertical stress distribution of the composite

4. Conclusion

Infilled PVD acts as an encased stone column affecting the displacement of the soft soil due to encasement stiffness. Thus, it will decrease the vertical displacement and stress concentrated higher on the column of the composite model.

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TOWARDS MITIGATING ACCESS CONGESTION IN SMART HOME USING MULTIPLE ACCESS POINTS

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Keywords: Cognitive Radio, Internet of Things, Raspberry Pi, Smart home.

1. Introduction

Digitalization has transformed all areas of our life with smart devices such as smart offices, smart cars as well as smart homes. Negatively, the increasing demands of smart home devices or the so-called IoT connections in homes, is making the network more congested [1]. Users often face service interruptions or connectivity issues between smart home devices [2]. Thus, a multiple access point using Raspberry Pi (RPi) implementation is proposed to connect different categories of devices thus mitigating these network issues. The connections are separated based on bandwidth utilization whereby one connection for home primary devices and the other connection for other devices. Hence, the network performance can be measured using network analyzer tools and the results can be analyzed in order to improve access congestion.

2. Methodology

The access points used daemon (*hostapd*) that was applied to the existing built-in Wi-Fi driver and enabled the NIC card and authentication server. The DNS masquerade (*dnsmasq*) function was used to configure DHCP. Figure 1 shows multiple access points in a smart home where the wireless router acts as a backbone to the RPi access point. A smart phone is configured to control smart home devices such as smart light, doorbell and Chromecast.
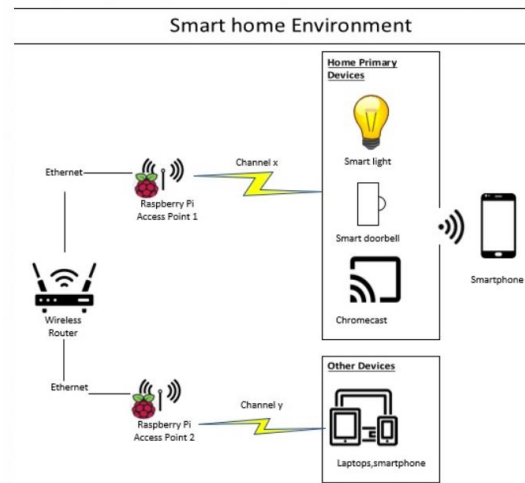
Figure 1. Multiple access points on smart home environment

3. Results & Discussion

All connections from the wireless router, access points (RPi) and end devices were connected successfully which confirmed all network connectivity was functional. The network performance testing shows an improvement in bandwidth utilization.

4. Conclusion

Deploying a smart home with multiple access points reduces network performance issues.

Acknowledgments

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NACOV PORTABLE AUTOMATIC SANITIZER

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1. Introduction

During the COVID-19 pandemic, the demand for hand sanitizers is growing as the general population becomes more aware of the importance of good hand hygiene. Following a review of the literature, an Automatic Spray Hand Sanitizer (NACOV) has been proposed to make it available to all Malaysians. NACOV intends to maximize the use of hand sanitizer near high-touch surfaces and communal areas, for example door handles at entrances and exits, trolley carts in markets, malls, and airports.

2. Methodology

A google form survey was used as data collection. The survey was conducted all around Malaysia. Around 20 respondents took part in this survey.

3. Results & Discussion

NACOV or Portable Automatic Spray Hand Sanitizer was designed to be used for public and personal use. It comes with four main colors which are white, blue, orange and green. NACOV also comes with various sizes starting from 100 to 3000 milliliters. NACOV design comes with an automatic sensor that sends out mist. This product uses a battery to function. NACOV was made of silicone and plastic which are eco-friendly and flexible materials. Adjustable straps located at the back can adjust the size of this automatic spray hand sanitizer.

4. Conclusion

To sum up, NACOV is a product that acts as a preventive measure against the spreading of Covid-19. It facilitates consumers in ways that bring benefits to both the individual and the public.

Acknowledgments

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FACILE SYNTHESIS OF ZnO/GRAPHENE NANOSTRUCTURES AND ITS SUPERIOR CONDUCTIVITY PERFORMANCE

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Keywords: Zinc oxide, ZnO/Graphene, Nanostructures.

1. Introduction

Zinc Oxide (ZnO) has become an important material for the development of various electronic devices [1]. However, pure ZnO lacks electrical conductivity properties. Therefore, its properties can be improved by using different ways such as doping and coating ZnO as the host material with other materials [2]. Graphene as a carbon material has an excellent electronic conductivity. Thus, combining ZnO with graphene can improve the properties of ZnO materials for superior conductivity as well as improve the device performance. In this study graphene was selected as the coating material on ZnO nanostructures to enhance the conductivity of ZnO nanostructures.

2. Methodology

ZnO and ZnO/Graphene nanostructure were prepared using a simple solution immersion technique. The current-voltage (I–V) characteristics for the samples were examined using a two-probe measurement system under ambient illumination.

3. Results & Discussion

Figure 1 shows the I–V characteristics of ZnO and ZnO/Graphene nanostructure samples. ZnO/Graphene nanostructures show the highest current intensity, indicating it has good conductivity properties.
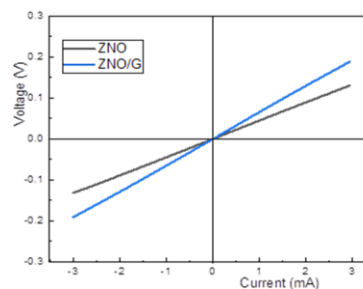
Figure 1. I–V characteristic curves of the samples.

Table 1. Electrical properties of samples.

Samples	Resistivity, ρ (Ω cm)	Conductivity, σ (S/cm)
ZNO	744	1.344×10^{-3}
ZNO/G	713	1.403×10^{-3}

4. Conclusion

The superior conductivity of ZnO nanostructures is indeed influenced by the graphene coating.

Acknowledgments

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MYSEJAHTERA SMART PORT (MySmartPort)

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Keywords: MySejahtera, User-friendly, Public building, Entrance, Sanitise, Smart-port.

1. Introduction

Before entering a public space, everyone is required to scan his temperature, scan My Sejahtera, and sanitise [1]. All three steps can be difficult to follow at times. Some may consider these SOP steps to be a burden to follow. Making matters worse if certain obstinate individuals refuse to follow the SOP owing to a lack of a tracking system. In other cases, the guards at the entrance do not always adhere to the SOP because they must still contact the people who wish to enter the public building. We came up with the concept of MySejahtera Smart Port @ MySmart Port based on our observations. MySmart Port may be able to assist more people in adhering to the SOP.

2. Methodology

Our product mechanism made use of existing technologies such as UV ray light to detect microorganisms, a screen monitor to display temperature status and QR codes, and a thermal temperature detector that can detect temperatures from a distance. For the foot pump, a sanitising system was devised. All factors of the material selection were considered, including cost, climate, and availability. In the future, this could lead to better product development and production.

3. Results & Discussion

Due to the movement control order (MCO 3.0), a set of 21 questionnaires with different types of questions was distributed via Google Form to evaluate the marketability of the new product. This result shows the SOP is an essential aspect that needs to keep improving when it comes to public places. So, MySmart Port functions as a mini kiosk to overcome this problem and help keep the public to always follow the SOP.

4. Conclusion

MySmart Port has the potential to become a cutting-edge product. It is a kiosk that reorganises sanitising, temperature monitoring, and QR code scanning to improve the SOP when entering a public space. When it comes to SOP requirements, the MySmart Port is more systematic and user-friendly. Because of the current state of Covid-19 pandemic, this innovation has the potential to become a market-leading product.

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NEURO-THERAPY: COMBINATION OF GAME-BASED AND NEUROFEEDBACK FOR ELDERLY WITH MEMORY DISORDER

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Keywords: Elderly, Game-based therapy, Memory disorder, Neurofeedback, Psychotherapy.

1. Introduction

Realizing that pharmacological treatments for memory disorder are costly and giving adverse effects, games have been chosen as an alternative intervention for elderly with memory disorder. Playing games requires mental concentration, memory and quick motor reaction in simulating the brain to work and gain memory back. A neuro-therapy game has been designed and developed based on the proposed guideline which comprises 20 criteria and to be utilized using neurofeedback approach.

2. Methodology

There are four main phases involved in producing Neuro-therapy game as shown in Figure 1.
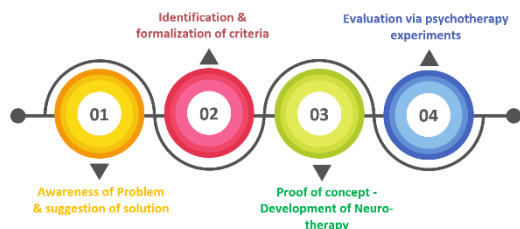
Figure 1. Phases of producing Neuro-therapy game

3. Results & Discussion

Psychotherapy experiments have produced interesting findings in terms of improving memory recall among elderly. It is proven through the improved time taken in assembling the puzzle as shown in Figure 2. Other interesting impacts include improved skills and IT literacy among elderly.
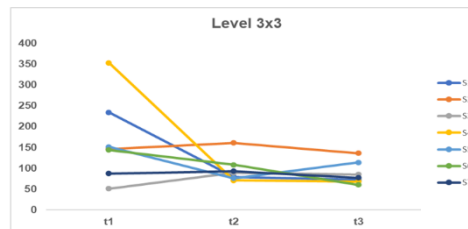
Figure 2. Memory recall improvement

4. Conclusion

Neuro-therapy game offers many significant benefits to its users, particularly the elderly. Findings from our experimental validation via psychotherapy experiments have proven that simulating the brain by utilizing neuro-therapy games have improved the memory of elderly.

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DysRedia: A GAME FOR THE DYSLEXICS

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Keywords: DysRedia, Dyslexic games, Dyslexia intervention.

1. Introduction

DysRedia was intended for dyslexic children of primary school age. It consists of 10 levels which contain various animal pictures. Children will play the drag and drop game by moving alphabets to spell the name of the animals. Tokens are granted if they are correct. Tokens accumulated throughout the game can be redeemed when they need to get hints for answers. Sounds and music are also incorporated into this game to make it more fun for the dyslexic children.

2. Methodology

The methodology used in this study is as shown in Figure 1.

Figure 1. The Methodology

The criteria were gathered using interviews and systematic literature review. These were used to develop guidelines. The guidelines were used along with the gathered requirements to determine how DysRedia should be designed and developed.

3. Results & Discussion

Figure 2 shows the interfaces of DysRedia. This game has been evaluated by the teachers and the dyslexic children. Result shows the use of the preferred criteria mentioned in the guidelines such as the use of lowercase letters, Comic font type of size 16, incorporated rewards, a simple flow and some other features. made DysRedia an easily be used and a useful tool for the dyslexic children.

Figure 2. DysRedia Interface

4. Conclusion

DysRedia is used as a tool to evaluate the guideline we developed in response to the lack of a standard guideline for the dyslexic games [1]. The result of the evaluation confirmed the validity of the guideline. Future works should focus on enhancing DysRedia by incorporating more preferred criteria into the game.

Acknowledgments

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AN APPLICATION FOR BEGINNERS TO CREATE DANCE
(THE ABCD)

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Keywords: Creative movement and exercise, Dance, Online teaching, Chat room.

1. Introduction
Smartphones are the most effective in learning across multiple contexts. This personal electronic device enables social and content interactions [1]. The ABCD is an application that has been designed to facilitate targeted groups to search the information regarding materials on exercise and its benefits towards health such as weight reduction [2], self-esteem and body size dissatisfaction [3].

2. Methodology
40 participants (n = 40) voluntarily took part in this research survey. The method used was dependent on the users' existing dance skills and techniques since most of these participants did not know how to dance nor were they able to differentiate it. ABDC app is a search platform to be used as a reference for a course called Creative Movements and Exercise. It can be utilized to search for academic, health-related materials and information on dance selections.

3. Results & Discussion
The results indicated that majority of respondent said 'Yes' in their interest to use this mobile applications (95%), have excellent experience using the mobile applications (65%), used more than 5/day (85%), for the purpose of social media (70%), frequently assist them in achieving their purpose (52.5%), have an experience using academic mobile applications (97.5%) and agrees that mobile applications can assist in learning subjects (97.5%).

4. Conclusion
An application has been designed to assist a beginner dancer to search for the most suitable dance. Recently, the ABCD app has been improved by adding a chat room that enables two-ways communication.

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CURM-L: SKIN HEALTH PRODUCT FROM *CURCUMA LONGA* LEAVES

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Keywords: *Curcuma longa*, Antioxidant, Skin problem, Turmeric.

1. Introduction

Curcuma longa L. commonly known as 'turmeric' is the genus of 70 species of rhizomatous herbs, a member of the ginger family (Zingiberaceae). This plant has dark green and large oblong leaves. *C. longa* leaves can be used as flavor to various dishes as they are beneficial for health [1]. In medicine, C. *longa* is used for the treatment of hepatic disorder and rheumatism [3]. The common compound responsible for the antioxidant activity of *C. longa* was reported as a phenolic compound as well as saponin [2]. Since this plant exhibits good results of antioxidant activity, it would be suitable for the formulation of new body soap and skin cream which can be utilized as an alternative way to protect skin.

2. Methodology

Curm-L skin cream and body soap preparation

The water extract of *C.longa* was dispersed in oil mixture using dispersion method until the perfect cream texture was obtained.The lye-containing *C.longa* water extract was mixed with oil mixture. The mixture was gently stirred and poured into any desired mold. The solid soap from C.*longa* was formed after leaving it for 24 hours.

3. Results & Discussion

Figure 1 shows the result of the application of products from *C. longa.* The impressive results might be due to the presence of antioxidant compounds from *C. longa* to reduce the severity of itching and inflammation such as polyphenols and flavonoids. Moreover, the presence of another active compound saponin might probably have contributed to the result obtained. Antioxidant compounds and saponin are also the source of bacteria's inhibition.
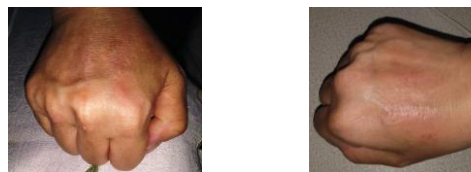
A: Day 1   B: Day 3

Figure 1. A: Red inflammation can be seen. B: third day application of product. Severity of inflammation reduced.

4. Conclusion

Potential skin cream and body soap from *C. longa* leaves were well formulated. The product consumption can reduce the severity of itching and red inflammation of the outer layer skin.

Acknowledgments

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Rent2U: MOBILE APPLICATION FOR RENTAL EQUIPMENT AT UiTM SHAH ALAM

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Keywords: Mobile application, Equipment rental, Android, Mobile Application Development Life Cycle (MADLC), Geolocation, Push notifications, Payment gateway, Android studio, Java, Firebase, Application Programming Interface (API).

1. Introduction

Nowadays, the development of mobile applications is growing at an enormous rate. It seems there is an application for everything, from food, groceries, clothing, booking a taxi ride to renting or sharing a home [1]. Hence, the project called *Rent2U* can help students to rent items and equipment has been developed to solve problems often faced by students who are unable to afford items, in need of one-time use of goods, or simply to explore their hobbies.

2. Methodology

The development of Lelong2U mobile application has applied the Mobile Application Development Life Cycle (MADLC) [2] as a methodology.

3. Results & Discussion

The following are the screenshots of the *Rent2U* prototype development:

4. Conclusion

It is hoped that there are opportunities to enhance or improve Rent2U mobile applications in the future.

Acknowledgments

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Figure 1. Login Page

Figure 2. Create Listing Page

Figure 3. Listing Information Page
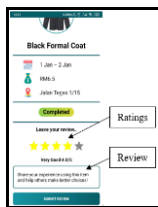
Figure 4. Ratings and Review Page

Figure 5. Map View Page
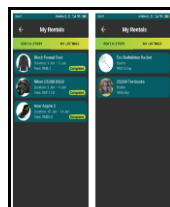
Figure 7. Rental History Map

Lelong2U: ANDROID-BASED MOBILE APPLICATION FOR ONLINE AUCTION

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1. Introduction

With the rapid growth in information technologies, online auctions have become more popular in many marketplaces [1]. Looking at this scenario, an online auction mobile application for an Android-based operating system called Lelong2U has been developed to provide an online platform for the seller and buyer to bid and auction the items in Malaysia.

2. Methodology

The development of Lelong2U mobile application has applied the Mobile Application Development Life Cycle (MADLC) [2] as a methodology.

3. Results & Discussion

The following are the screenshots of the Lelong2U prototype development:

Figure 1. Login Page
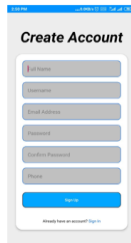
Figure 2. Registration Page
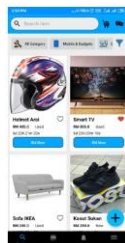
Figure 3. Searching Page

Figure 4. Add Item Page
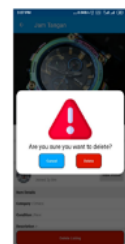
Figure 5. Delete Item Page
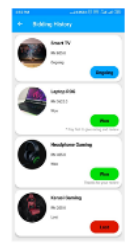
Figure 6. Bidding History Page

4. Conclusion

The innovation aims to identify the potential chances or opportunities to enhance or improve Lelong2U mobile application in the future.

Acknowledgments

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FRUIT WRAPPER FROM FISH GELATIN INCORPORATED WITH LEMONGRASS EXTRACT

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Keywords: Fish gelatin, Lemongrass, Incorporated film, Fruit packaging.

1. Introduction

Protein-based film from fish has received recognition as a demanding packaging item, because of their good performance especially as a gas barrier, posses features of biodegradation thus environmentally friendly. The inclusion of active ingredients has improved antioxidant activity of the gelatin films hence qualifying it as part of food protection and preservation purposes [1]. Lemongrass has high antioxidant properties, hence in this study, the lemongrass extract was incorporated with the gelatin film extracted from the Nile tilapia's fish scale. The quality changes of fruits wrapped with lemongrass extract incorporated gelatin film was compared with the control film (without lemongrass extract). The mechanical properties and physical properties of the incorporated film and control film were also determined.

2. Methodology

The incorporated film was prepared by using the method as described by Li et al. [2] with a slight modification.

3. Results & Discussion

The results of DPPH scavenging activity, shows that film solution incorporated with lemongrass extract was able to inhibit free radical due to the high amount of inhibition which is 72.50% at concentration of 125 ppm. The incorporated film also shows mechanical properties improvement compared to control film. The moisture content of the incorporated film (13.17%) was lower than control film (23.12%). The lemongrass extract incorporated gelatin film can reduce the water content in the film to enhance the stability of the film. Cherry tomatoes that were wrapped with incorporated film had the lowest weight loss followed by cherry tomatoes wrapped with control film (19%) and unwrapped cherry tomatoes (21%). This finding suggested that the incorporated film can preserve the quality of the cherry tomatoes.

4. Conclusion

Gelatin film incorporated with lemongrass extract shows a great potential to be used for fruit wrapping application.

Acknowledgments

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JIRINGA ANTISEPTIC CREAM

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Keywords: Antiseptic, Antimicrobial activity, Herbal cream, Pithecellobium jiringa.

1. Introduction

The recent COVID-19 pandemic has initiated awareness on hand hygiene to prevent disease transmission. The common practice by health care workers during COVID-19 outbreak in China was that 66.1% of them washed their hands more than 10 times, but only 22.1% applied moisturizer after hand washing [1]. The imbalance frequency of hand washing and moisturizer application resulted in an increasing risk of hand dermatitis. The importance of moisturizer had inspired us to formulate the first ever Jiringa Antiseptic Cream. *Pithecellobium jiringa* (*P. jiringa*) stem bark extract contained in this cream was the main ingredient to treat skin problems. The mixture of various secondary metabolites which are phenolic compounds, saponins, and terpenoids can act as an antimicrobial property especially skin diseases [2]. In our work, the stem bark ethyl acetate extract of *P. jiringa* indicated a good inhibition towards the microbial assays. Formulated from natural resources, this cream has less side effects to the human body and it is suitable for all ages.

2. Methodology

2.1. Microbiological Assay

Nutrient Agar (NA) were inoculated with *Staphylococcus aureus* (*S. aureus*), and *Bacillus cereus* (*B. cereus*). The cream was aseptically transferred to the inoculated agar plates and incubated for 24 hours at 37 ℃. The inhibition activity of microbes was measured on the diameter of the clear zone (mm). Ampicillin (10 µg) was used as a standard and solvent as a negative control.

3. Results & Discussion

The effectiveness of Jiringa Antiseptic Cream was shown by a high inhibition zone at concentration 2.0 % w/v [3].

Table 1. Antibacterial activities of cream formulations on *S. aures* and *B. cereus*.

Bacteria	Concentration (% w/v)	Diameter (mm)	
		Jiringa Cream	Ampicillin
S.aureus	0.5	8.23±1.03	12.89±0.30
	2.0	11.52±0.68	
B.cereus	0.5	10.87±0.19	14.14±0.16
	2.0	11.45±0.64	

4. Conclusion

Jiringa Antiseptic Cream as a moisturizer with added antimicrobial activity is an alternative cream to treat skin diseases.

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UTILIZATION OF BIODIESEL FROM CRUDE PALM OIL AS SOLVENT TO OVERCOME WAX PROBLEMS IN OIL FIELD

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1. Introduction

One of the problems in the oil and gas industry is the wax component in crude oil [1]. The chemical method has proven to be the most effective method of mitigating wax deposition in the petroleum system because it is associated with the root causes of wax formation [2]. Based on their chemical properties, vegetable oil can be said to be chemically compatible with petroleum. Thus, the use of biodiesel is expected to be an alternative solvent as a chemical method [3].

2. Methodology

Crude oil was obtained from four oil companies in Riau which were identified as samples (A, B, C D). Each sample weighed 5 grams. It is then added to biodiesel with a volume of 60 ml, 80 ml, and 100 ml and heated at temperatures (pour point, tubing, bottom hole). The solution was heated in a water bath for an hour and filtered with filter paper. Then, it is dried at room temperature for 24 hours. The filter paper and insoluble deposits were weighed and the dissolution % loss was calculated.

3. Results & Discussion

Dissolve wax at (5g/60 ml; 5g/80 ml; 5g/100ml) and heated at any temperature conditions (pour point, tubing, bottom hole) offered such data. Sample A (40.5 ˚C; 49.1 ˚C; 57.7 ˚C), sample B (30 ˚C; 44 ˚C; 65 ˚C), sample C (37.8 ˚C; 52.8 ˚C; 62.8 ˚C) sample D (43.3 ˚C; 65.5 ˚C; 88.9 ˚C). The best % dissolution loss is at the bottom hole temperature. Sample A (87%; 89.2%; 89.4%), sample B (85.2%; 86.4%; 86.8%) sample C (89.4%; 90.6%; 89%) and Sample D (89.8%; 90.2%; 89%). The performance of biodiesel is better in dissolving wax at increasing temperatures. The increase in solvent concentration did not significantly affect the increase in % of dissolution loss. However, in terms of solubility from an economic point of view, it is good because the largest percentage of dissolution loss is at the smallest biodiesel solvent concentration.

4. Conclusion

Firstly, biodiesel had a better dissolution percentage at high temperatures. Secondly, the finest effectiveness of biodiesel performances in crude oil samples is sample C (90.6%) followed by sample D (90.2%) Sample A (89.4%) and last sample B (86.8%).

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REMOTE LEARNING FOR GEOLOGY USING DIGI-FC-GEO

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Keywords: Digital flash card, Geology, Online distance learning, Open access, Self-learning.

1. Introduction

Online learning has replaced the usual face-to-face classroom and utilised the technological devices, tools and the internet [1],[2]. Digital Flash Card for Geology (DIGI-FC GEO) is an innovation based on the learning concept using flashcards, using the digital platform, to enhance students' understanding of the concept and theory in Geology.

2. Methodology

The innovation uses the Digital Platform and it is available as open access via quizlet.com. Quizlet is a free mobile and web-based education providing learning tools for students (Kálecký, 2016). This platform allows the users to create their own content with different kinds of information such as texts, images, and videos.

3. Results & Discussion

Pre- and post- studies were conducted to gauge students' perception after using this digital flash card. 60 students were involved in this survey and more than 90% of the students agreed that this digital flash card fulfils the syllabus of geology and helps them in their self- revision. Besides, they claimed that the flash-card approach was 'interesting', 'simple concept but beneficial', 'not only for young learners but can be used for adult learners as well', and 'practical'. The students also claimed that DIGI-FC GEO practical as they did not have to bring bulky books and materials to learn the subject.

4. Conclusion

DIGI-FC-GEO has shown that it has great potential to be adopted as a tool to aid student learning, especially in the Open Distant Learning approach. Even without face-to-face learning and the presence of an instructor, DIFI-FC-GEO can be beneficial to students as the contents are organised in a structured manner and easily accessible.

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HIGHLY PHOTOACTIVE AL-DOPED ZNO PHOTOCATALYST AGAINST TEXTILE WASTEWATER

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Keywords: Aluminium; ZnO; Photoactive; Photocatalytic; Wastewater.

1. Introduction

Dyes wastewaters from textile industries were reported to be a major river contaminants that consume large amounts of discharge effluent during dyeing and finishing operation. Photocatalytic degradation using semiconductor photocatalyst is one of the alternative ways to degrade and remove the organic pollutants [1]. In this work, a simple sol-gel method was employed to synthesize Al-doped ZnO as photo active material to degrade the dye solution of methyl orange (MO) dye as a pollution representative under UV light irradiation.

2. Methodology

Al-doped ZnO samples were synthesized using the facile sol-gel method. Typical photocatalytic degradation experiment was carried out. The MO solution and Al-doped ZnO photocatalyst were exposed parallel under UV light. The change of concentration of MO dye molecules was monitored and analyzed.

3. Results & Discussion

Figure 1 shows that 1 mol % Al-doped ZnO shows the highest percentage degradation of 88.87 % by 60 min and rate constant, k compared to other samples.
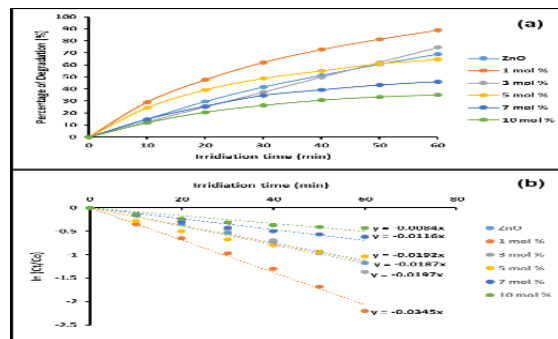
Figure 1. (a) Comparison of percentage degradation of MO (b) Linear kinetic fit for the photodegradation of MO dye.

4. Conclusion

Al-doped ZnO photocatalyst shows a highly photoactive performance owing to the effectiveness of electron-hole pairs separation and can be potentially used against textile dye waste-water treatment application.

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SUPERACTIVE ZNO-BASED PHOTOCATALYST UNDER VISIBLE LIGHT IRRADIATION

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Keywords: ZnO; Photocatalyst; Nickel; Graphene oxide; Visible light.

1. Introduction

Wastewater contains microorganisms, inorganic, and organic pollutants. Thus, there is an urgent need to eliminate such pollutants by developing some technically viable process. ZnO has green properties, cheap price, nontoxicity, high physico-chemical stability, great photo stability, so it is one of the most popular and effective photocatalysts [1]. Combination of semiconductor oxide with carbonaceous materials such as graphene oxide is attractive to enhanced photoactivity. Therefore, in this research we report the facile preparation of superactive ZnO- based photocatalyst i.e. Ni-doped ZnO/GO nanocomposites.

2. Methodology

A facile ultrasonic assisted sol-gel method was used to prepare the Ni-doped ZnO/GO at different GO loading. GO was added into the stock solution and undergoes a typical synthesis process. The photocatalytic degradation of the sample was evaluated using methylene blue (MB) dye under direct sunlight irradiation and the residual concentration was monitored and analyzed using UV Visible spectrophotometer.

3. Results & Discussion

All the degradation behaviors were analyzed and extrapolated in the following graph as presented in Figure 1. The incorporation of GO (0.1 g) into the samples shows the highest percentage degradation of 95% compared to another sample.
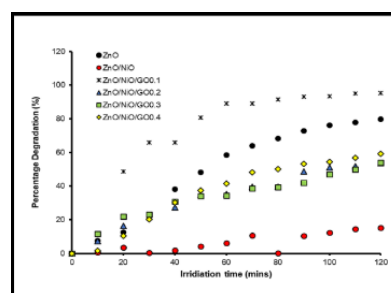
Figure 1. Percentage of degradation of MB under sunlight irradiation

4. Conclusion

The Ni-doped $ZnO/GO_{0.1}$ exhibited the best photocatalytic degradation of MB under direct sunlight within 120 min with 93.49% percentage degradation.

Acknowledgments

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COVID-19 SIR MODEL WITH VACCINATION

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Keywords: COVID-19, Routh-Hurwitz criteria, SIR model, Stability, Vaccination.

1. Introduction

COVID-19 SIR model with vaccination uses actual daily data to measure the effect of immunisation on the COVID-19 outbreak in Malaysia. SIR-type model is better for drawing qualitative inferences about the COVID-19 outbreak's evolution [1, 2]. Mathematical analysis is used to determine the disease-free equilibrium, the endemic equilibrium, and the basic reproduction number of the proposed model. In addition, the stability of equilibriums is studied using the Routh-Hurwitz criteria, and numerical simulations are conducted to assess the impact of vaccination at different paces.

2. Methodology

The equations that govern the model depicted by Figure 1 are

$$S' = \mu - (\mu + v + \beta I)S \qquad (1)$$
$$I' = \beta SI - (\mu_i + \mu + \gamma)I \qquad (2)$$
$$R' = \gamma I + vS - \mu R \qquad (3)$$

where N, S, I and R represent the total population, susceptible population, infected population, and recovered population. Terms μ, μ_i, v, β and γ are the birth/death rate, the death rate caused by COVID-19, the vaccination rate, infection rate, and the recovery rate.
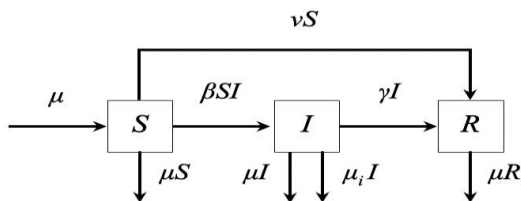
Figure 1. COVID-19 SIR Model with Vaccination

3. Results & Discussion

The SIR model suggested that the proportion of infected population is reduced as the vaccination rate is increased, as depicted by Figure 2.
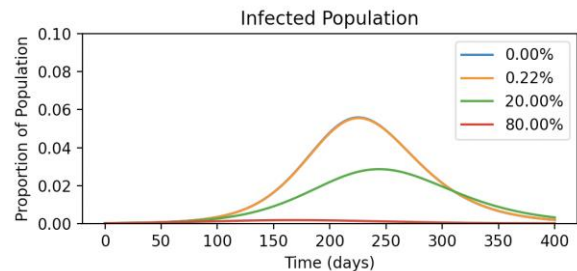
Figure 2. Effect of Vaccination Rate on the Proportion of Infected Population

4. Conclusion

The proposed model successfully revealed a significant difference between the vaccination rates on reducing the number of cases. As a conclusion, vaccination is an immediate effective solution for combating the outbreak of COVID-19.

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NATURAL FRESHNESS AND DEFENSIVE SPRAY

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Keywords: Clove, Mint, Freshness, Defensive, Toothaches.

1. Introduction

Most natural products are innovated as potential pharmaconutrition. The bioactive components of clove demonstrate numerous pharmacological properties such as antioxidant, antibacterial, antiviral, antifungal, antimutagenic, anti-inflammatory, anti-allergic, and dental caries qualities [1]. The objective of this project is to develop a multipurpose spray from natural ingredients. This spray may be used for freshness, treating toothaches, as an insect repellent spray, food protection and as a defensive spray.

2. Methodology

To make the Natural Freshness and Defensive Spray, it takes around 20 minutes of preparation with a total cost of RM3. With this total cost, it can produce around 50ml of spray. The ingredients are 1 cup water, 2 teaspoon whole cloves and 10 gram mint leaves. First, boil the water, then put cloves and mint leaves into the boiling water. Allow 10 minutes for the spices to infuse. Using a fine-mesh strainer, strain the mixture twice. Pour into a lidded bottle.

3. Results & Discussion

Clove and mint are truly delivering mouthful or dental benefits as it has natural painkilling and antibacterial properties. It can help reduce gum swelling and irritation, it also helps remineralize teeth due to the protection properties. A combination with peppermint brings coolness in the mouth as its natural anti-inflammatory and antibacterial properties help curb the growth of bacteria in the mouth, further preventing infections. Besides, it can be used as a defensive spray and insect repellent spray, with no exposed trigger and an affordable option to carry in pockets and purses.

4. Conclusion

This spray was primarily designed with the essence of mint to allow individuals to take better care of their oral hygiene and as natural tooth preservation. Having a decent mouth spray will make it much easier for individuals to freshen up. Using these sprays will be better than chewing gums or candies and, as good as pepper spray for self defence.

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SolGlaz : POTENTIAL 2 IN 1 SOLAR GLAZING GLASS

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Keywords: Solar glass, Amino(methyl) Pyridine, Nitrogen-less method, Solar energy materials.

1. Introduction

Building integrated photovoltaics are one of the most efficient ways to harness solar energy. Semi-transparent PV modules can be used to generate electricity in place of traditional glass in buildings. Developing energy-efficient, cost-effective and environmentally friendly window glazing technologies is thus critical not only for retrofitting existing buildings but also for improving the quality of life [1-3].

2. Methodology

2.1. Synthesis and Device Fabrication

Perovskite crystals is produced by refluxing 2-AMP and $PbBr_2$ in HBr acid. The precipitate crystal was cooled in an ice bath until it reached 10 ℃. The yellowish crystals were filtered and dried overnight in a 40 ℃ oven. The crystal's liquid precursor was obtained by diluting it with DMF. 5 g of TiO_2 powder mixed with 5 mL of distilled water to make a TiO_2 slurry. Ethanol was used to clean the ITO coated glass. Separate layers of TiO_2 and hybrid AMP-perovskite were blade-cast onto two different ITO glasses and dried at room temperature. The coated ITO glasses were sandwiched together and named '*SolGlaz*.'

3. Results & Discussion

The voltage-response of '*SolGlaz*' under sun radiation between 11 am to 1 pm shows good consistency with $V_{DC(max)}$ value of 0.22 V as the voltage increases with sunlight irradiance intensity as shown in Figure 1.
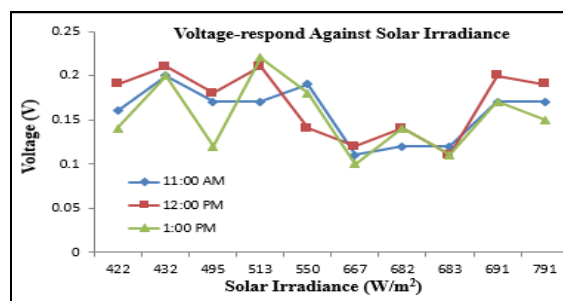
Figure 1. Voltage-response graph of '*SolGlaz*'.

4. Conclusion

'*SolGlaz*' has a high potential for use as a future solar glazing window since it reacts very well to solar irradiance. More doping of the existing AMP-perovskite to obtain other colour appearances may be carried out in the future to obtain more attractive thermochromic properties.

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SHELVES 4 SHOES LOVERS: ONE-STOP SPORTS SHOES

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1. Introduction

One-stop-shop concept is the core of every modern commerce which provides an efficient way of seeking and comparing information of products. It is more convenient and time saving to buy from them. "Shelves 4 Shoes Lovers", an A-Z website which gathers dozens of online shops specializing in sports shoes, was designed using the information gained from the understanding of online sports products shoppers' behaviors and preferences.

2. Methodology

To begin, "Shelves 4 Shoes Lovers" website was designed by taking into consideration the innovativeness experiences identified in a study of website innovativeness. To finalize the quality of this website, the Website Evaluation Questionnaire developed by [1] was shared with 100 e-retail sports products shoppers (students from Faculty of Sports Science and Recreation, Universiti Teknologi MARA Perlis Branch). Findings were then used as references for final touch to ensure the effectiveness and implementation of this one-stop sports shoes website.

3. Results & Discussion

The evaluation results revealed that dimensions of concern in creating an effective website are structure ($\bar{x} = 3.28$), comprehension ($\bar{x} = 3.09$), relevance ($\bar{x} = 3.08$), , ease of use ($\bar{x} = 3.05$), completeness ($\bar{x} = 3.00$), and layout ($\bar{x} = 2.95$).
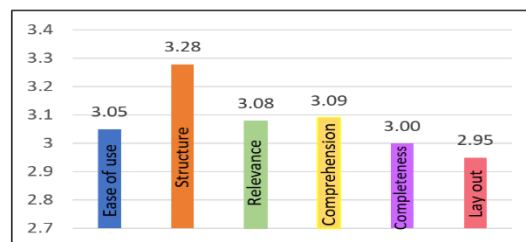
Figure 1. Dimensions of Concern in Creating an Effective One-Stop Sports Shoes Website

4. Conclusion

This shoppers' behaviours and preferences towards one-stop sports shoes platform shed a new light to the understanding of the website characteristics. This contributes to shoppers e-loyalty in a one-stop sports products business. Thus, it contributes to the growing understanding of the e-retail sports products business as a basis to implement better e-service website strategies, especially during this pandemic.

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DEVELOPMENT STRATEGY OF COASTAL AREA IN RUPAT ISLAND

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1. Introduction
Rupat island is one of the islands located in Bengkalis Regency, Riau Province. It is categorized as a coastal area which covers the eastern part of Sumatera Island amounting to 11.481,77 km² and consists of island and sea. The coastal area in Rupat Island is very prone to abrasion, because they are directly exposed to the open ocean. Rupat Island is a coastal area that has high economic value, but is threatened by coastal unsustainability. The coastal areas are faced with high threats. The coastal areas should be properly gazetted and need to be handled specifically so that this area can be managed properly and sustainably.

2. Methodology
The research approach uses a quantitative approach. Indicators used are: shoreline changes, land use, socioeconomic characteristics of society, and government policy. This study uses primary data such as field observation and questionnaire distribution as well as secondary file, in the form of landscape 7ETM + Time series image data and agency data. Using descriptive methods, GIS/Visual interpretation, and SWOT Analysis, findings are comprehensive.

3. Results & Discussion
The results of this study showed that coastline changes have occured in North Rupat Island between 2000 until 2017, where the biggest change occured in 2013 (accretion amount of 375,5 Ha) and in 2014 (abratin amount of 50,63 Ha). The surrounding coastal land was used as a residential area and plantation area. The abrasion that occurred in the North Rupat District has been partially handled by the local government by making sheet piles and repairing the existing coastal areas.

4. Conclusion
The strategy for coastal management are creating plaster or breakwater, persuading the investor, promoting tourism, and increasing human resources.

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PROXIMATE AND SENSORY ANALYSIS OF *Caulerpa Racemosa* KEROPOK LEKOR

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Keywords: Protein, Lipid, Moisture, Ash, Sensory analysis.

1. Introduction

Traditionally, the main ingredients for making keropok lekor, a popular fish base product in Malaysia, is fish flesh and sago. To boost profit, keropok lekor may need some modification. *C. racemosa* is an edible green seaweed that contains a high amount of protein. In order to improve the properties of keropok lekor, *C. racemosa* was added. Therefore, the objective is to formulate keropok lekor with replacement of 10% and 30% of *C. racemosa* powder and the proximate and sensory analysis of the keropok lekor was determined.

2. Methodology

The ingredients are 1000 g of fish fillet, 5 g of monosodium glutamate (MSG), 1 g of salt and 500 ml of water or ice. *C. racemosa* powder with 100 g and 300 g was replaced from the amount of normal 1000 g (Table 1).

Table 1: Formulation of Keropok Lekor

Control	Fish (g)	Sago (g)	Salt (g)	Water(g)	MSG (g)
Normal	1000	1100	22	700	3
10%	900	1100	_	900	3
30%	700	1100	_	1100	3

2.1. Proximate and sensory analysis

Protein, moisture and ash content was determined as in [1], while lipid content was determined as in [3]. Sensory evaluation of qualitative parameters of the 3 samples was carried out using 9-point Hedonic scales [3].

3. Results & Discussion

The proximate analysis results from different formulations of *C. racemosa* (Table 2), shows that there is a significant difference (p<0.05) for all the proximate content between normal and *C. racemosa* keropok lekor.

Table 2. Proximate Analysis of Keropok Lekor

Parameter	Normal	Keropok + 100 g *C. racemosa*	Keropok + 300 g *C. racemosa*
Ash	1.17	1.88	4.14
Moisture	57.02	57.13	57.39
Protein	15.64	15.28	14.33
Lipid	3.91	4.83	5.25

The average score of the Hedonic scale for sensory evaluation of the keropok lekor revealed that keropok lekor with 10% replacement of *C. racemosa* powder had more odour and taste acceptances (Figure 1). The keropok lekor with the replacement of 10% is more attractive and has a better texture compared to the 30% replacement.
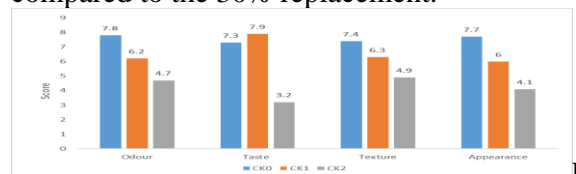
Figure 1. Sensory Analysis of Keropok Lekor

4. Conclusion

As a conclusion, the proximate analysis of the *C. racemosa* keropok lekor show significant differences in protein, moisture, lipid and ash content. The sensory evaluation shows, the replacement of 10% of *C. racemosa* powder provides better sensory characteristics and nutritional value.

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SOCIAL MEDIA ASSISTED LISTENING 'THINK PAIR SHARE' LEARNING MODEL FOR UNDERGRADUATE STUDENTS AT UNIVERSITY IN INDONESIA

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1. Introduction

The aim of this study is to see the conditions and the needs of the teaching listening. The facts showed that (1) the teacher-centered model is still used in many of the classrooms, (2) the learning and teaching of listening comprehension are not optimal yet and teaching models applied are incapable to achieve the set learning goals; (3) there are many problems found by lecturers and teachers in how to become an effective listener. The aim of this study is to develop a valid, effective and practical listening method by using Social Media Assisted Learning Listening Think Pair Share Teaching (SMALTPSL) model, using YouTube and Whatsapp.

2. Methodology

This study used the Research and Development (R&D) approach and ADDIE model in the development procedure [2]. Primary data were collected from 38 students and 2 lecturers of English Language Education of the Islamic University of Riau Indonesia who were taking interpretative and basic listening courses. There are also four experts to validate the design and the content of this model. Data were collected through questionnaires and analyzed quantitatively using the regression method.

3. Results & Discussion

Based on the analysis stage, both the lecturers and the students are still having difficulties in the listening component and that there is a need to develop a model that can help students to listen with better comprehension. Second, this research has developed a SMALTPS Learning Model by using the ADDIE development model.Third, at the development stage, the researcher concluded that all the research products, namely teaching model book, lecturer book, student book, syllabus as well as lesson plan are valid and practical. The validity of research products are identified by distributing questionnaires to the expert to validate the product. The practicality of research products were also identified by distributing questionnaires to the users of the products, that are the lecturers and the students. Finally, at the implementation stage the researcher concluded that the teaching model was effective in helping students listen with better comprehension. The teaching model was proven effective based on the analysis of the students' scores at the beginning of class until the final exam. [1]

4. Conclusion

The result of this study found that SMALTPSL model is considered effective, valid and practical and that it can be used to improve the four Listening skills: (1) determine vocabulary meaning from context; (2) identify main idea with supporting details; (3) listening for a specific purpose and 4) recognizing specific grammatical structures within the setting for students.

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MALAYSIAN SECONDARY BOARDING SCHOOL MENU PLANNING SYSTEM WITH POST-OPTIMALITY PROCESS

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1. Introduction
Students need to eat well-balanced nutritious food for legitimate development, with the end goal is to repair and support the body tissues and avert undesired disease [1, 2, 3]. This study intends to build up a scientific mathematical model and decision support system for menu planning that improves and meets the vital supplement consumption for boarding school students aged 13-18 while saving the financial cost. It gives the flexibility for the cook to change any favored menu even at the end of the programme.

2. Methodology
Serving a healthier menu is a noteworthy stride towards producing fine boarding students. A recalculation procedure was performed because of the ideal arrangement. The data were gathered from the Ministry of Education and boarding schools' authorities.

3. Results & Discussion
A well-balanced menu scheduling is produced which meets all the constraints. The model was fathomed by utilizing Binary Programming and the "Sufahani-Ismail Algorithm" and a system was developed to comply with the problem.

4. Conclusion
The Malaysian Secondary Boarding School Menu Planning System is the first system in Malaysia and the world. It can also be used for other problems such as the military, hospitals and others.

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CLASSIFICATION OF ELECTROENCEPHALOGRAM (EEG) AND GRAPHOLOGY FOR STUDENTS USING ARTIFICIAL NEURAL NETWORK (ANN)

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1. Introduction
An emotional state is where psychological and physiological conditions are interconnected and evaluated [1]. Emotions are subconsciously formed and characterized as bodily conditions [2]. The space of an emotional state can be generated from psychological factors using a discrete model or a dimensional model.

2. Methodology
The Emotiv is used to record the EEG signal during a writing process. In pre-test, the subjects are given a consent letter, questionnaire, and stationery to reduce the error in examining the features of handwriting. These features are analysed manually where baseline conveys an emotional outlay and the nature of the subjects. With Emotiv attached to the subjects' heads, they write a happy story for two minutes followed by a sad story without referring to any sources. An ascending baseline indicates optimistic, happy, active, and excitable subjects. The features related with the emotional states such as total power spectral density, maximum PSD and minimum PSD are extracted from the pre-processed EEG signals. These features are used to estimate emotional states by classification methods.

3. Result & Discussion
Happy stateEEG pattern shows the total power of Alpha (96.2%) is dominant over Beta. Sad state also produces higher total power for Alpha (95.5%) than Beta. For graphology analysis, the emotions categories were defined with the associated handwriting attributes. Finally, the cross validation is made to find the correlation between the EEG pattern and graphology analysis. The happy students tend to write in an ascending baseline where the value of Alpha power is higher. In sad condition, the baseline of the handwriting is descending and Alpha power value also drops.

Table 1. Power for happy and sad emotions

Emotion	AF3		AF4	
	Alpha	Beta	Alpha	Beta
Happy emotion	9	4	9	4
Sad emotion	8	3	7	4

Table 2. Emotions categories & handwriting attributes.

Emotions Categories	Handwriting Attributes	# Students
Happy emotion	Ascending baseline	13
Sad emotion	Descending baseline	11

4. Conclusion
The cross validation between the EEG pattern and graphology analysis approved that both can determine the emotions of the subjects. Future study may include more categories and samples to make stronger cross validation.

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N,N-DIETHYLETHANOLAMMONIUM Cl/EG DEEP EUTECTIC SOLVENT AS AN ALTERNATIVE FOR IONIC LIQUID

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Keywords: N,N-diethylethanolammonium chloride, Ethylene glycol, DES, Ionic liquid.

1. Introduction

Ionic liquids (ILs) that have an expensive production process and toxicity issues have hindered their industrial application. An alternative material is deep eutectic solvent (DES) that is less toxic, biodegradable and cheaper to produce [1] is generated to replace the usage of ILs. DES was prepared by mixing hydrogen bond donor (HBD) compounds (ethylene glycol) and hydrogen bond acceptor (HBA) compounds (N-N, Diethanolammonium Chloride), which interact via hydrogen bonding. The goal of this work was to study the optimized ratio and physical properties of DES and to investigate structural changes during the mixing process.

2. Methodology

DES was prepared by heating HBD and HBA at 60°C with 600rpm stirring rate for 2 hours until a homogeneous and colourless liquid formed. Molar ratios of HBD/HBA were varied. Viscosity, thermal conductivity properties and FTIR study were measured.

3. Results & Discussion

Synthesized DES possess good thermal conductivity however viscosity data showed increasing HBD content decreases DES resistance to flow [2]. Hence, this type of DES is suitable to be used in any heat transfer instrument that can compete with conventional ILs. From spectra study, the most significant peak was the redshift of CH_2CH_2-O stretching vibration at around 1081 and 1035 cm^{-1}, which indicated that there were more stabilizing hydrogen bonds being formed between DEEACl and EG. There were no other strange peaks presented. This showed that there were no by-products produced during the mixing processes.

4. Conclusion

Molar ratio of 1:2 gave the optimum, economical and convincing results as it has a higher thermal conductivity value, low viscosity and is sustained in liquid form at room temperature. FTIR revealed that formation of DES only involves physical mixing and delocalization of ions. Data presented could be useful for future applications of DES that can replace the usage of ILs.

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APPLICATION OF MACHINE LEARNING IN DENTISTRY

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Keywords: Bone thickness, Machine learning, Mathematical modelling.

1. Introduction

The measurement of the outer bone thickness is a major factor in ensuring a successful treatment planning in many dental specialties. The problem statement is the outer bone thickness can only be viewed and measured with three-dimensional X-ray imaging that exposes patients to high radiation dose and could potentially lead to the development of cancer. Three- dimensional X-ray imaging is also an expensive procedure. Thus the objectives are to formulate a prediction model for outer bone thickness using machine learning and to use the model in building an Android app to predict bone measurement.

2. Methodology

MATLAB programming language was used to develop prediction models for bone thickness. The models were used to build an android app to predict bone thickness.

3. Novelty

This is the first machine learning model and prediction app for bone thickness that gives an exact numerical prediction with a high level of accuracy and robustness. The benefits to doctors are that it allows doctors to predict outer bone thickness accurately in a safe and noninvasive manner using their smartphones without exposing their patients to high radiation doses. Knowledge of outer bone thickness could lead to a more successful treatment planning. The benefits to patients include avoiding them from exposure to high radiation doses during their dental treatment and this will minimize their cancer risk and reduce treatment cost. As for the benefits to society, it reduces radiation exposure and the possibility of cancer development is a major benefit to society, while the cost of treatment will also be reduced. The future plans include the app can be further enhanced, and the model can also be used to develop desktop software.

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STAT DECISION STARTER KIT (SDSK) v1.0: STATISTICAL ANALYSIS DECISION MAKING

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Keywords: Data analysis, Decision making, Exploring data, Statistical analysis, SDSK v1.0.

1. Introduction

Statistical analysis is very crucial in analyzing any research data but not all researchers are experienced in statistical data analysis. Statistical analysis helps reduce or eliminate errors so that researchers can confidently make conclusions to further the research. Since application software can allow the user to accomplish some goal or purpose, a statistical application called **SDSK v1.0** was created and built by using Ionic Framework software with the aim to help the beginners to explore and describe the data. This application also can easily facilitate the beginner in identifying appropriate statistical analysis for the research. This application was published in Google Store, hence it will be highly beneficial to the beginners with reasonable cost and time saving.

2. Methodology

Figure 1 shows the algorithm of statistical analysis decision making using SDSK v1.0.
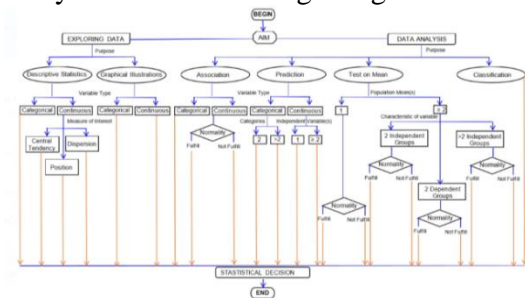
Figure 1: Algorithm of Statistical Analysis Decision Making

3. Results & Discussion

This process of identifying the appropriate statistical decision involves a few stages as shown in Table 1.

Table 1: Identifying Statistical Analysis Decision

Tasks		Conditions	Choice of significance test
a) Producing descriptive summaries of the data	Categorical variable		frequency, percentage (row, column or total)
	Continuous variable	summary value for the data set	mean, median, mode
		information on the variation among data values	variance, standard deviation, range
		determine the position of a single value	quartile, interquartile range, box and whisker plot
b) Producing a visual presentation of the data	Categorical variable		bar chart, clustered bar chart
	Continuous variable		histogram, dot plot and scatter plot
c) Identifying the relationship between two variables	Categorical variables		Chi-square test independence
	Continuous variables	variables are normally distributed	Pearson Product-Moment Correlation Coefficient
		variables are not normally distributed	Spearman's Rank Correlation Coefficient
d) Predicting the value for new occurrences	Categorical variable	two categories of dependent variable	Binary Logistic Regression
		more than two categories of dependent variable	Multinomial Logistic Regression
	Continuous variable	one independent variable	Simple Linear Regression
		two or more independent variable	Multiple Linear Regression
e) Identification of the significance test on a mean	One population mean	the variable is normally distributed	One sample t-test
		the variable is not normally distributed	Sign Test/ Signed Rank Test
f) Identification of the differences between means	Two independent groups	the variables are normally distributed	Two independent sample t-test
		the variables are not normally distributed	Mann Whitney Test
	More than two independent groups	the variables are normally distributed	One Way Analysis of Variance (ANOVA)
		the variables are not normally distributed	Kruskal Wallis Test
	Two dependent groups	the variables are normally distributed	Paired sample t-test
		the variables are not normally distributed	Wilcoxon Signed Rank Test
g) Classification of observation based on variable measured	Two or more groups of observation		Discriminant Analysis

4. Conclusion

SDSK v1.0 is equipped with detailed features that will give benefit to the user, where users can identify the appropriate statistical analysis easily. Besides that, the user can use this application in various situations even with little knowledge in statistics.

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THE COASTAL INUNDATION MODELLING DUE TO SEA LEVEL RISE (SLR) IN DUMAI CITY

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Keywords: Coastal, Dumai, Inundation, Sea level rise.

1. Introduction

Indonesia is one of the largest archipelagos countries in the world that has more than 80000 km of shoreline and more than 1700 islands. One of the cities that is located at the interface area between land and water (coastal area) is Dumai, a city on the eastern coast of Sumatera Island. Dumai city is a strategic industrial city as it is located directly bordering Singapore and Malaysia. Since Dumai was declared as one of the National Strategic Industrial Cities, it has a high urbanization rate [1]. There is a high amount of community activity and development that leads to a tremendous impact on the environment [1]. One of the impacts is the coastal inundation due to Sea-Level Rise (SLR). Flood may occur around the shore and now extends to most areas of the city [2]. The objective of this paper was to simulate the coastal inundation due to SLR using the Geographical Information System (GIS) approach.

2. Methodology

The main method of this research is simulating the coastal inundation due to SLR which uses GIS as the main instrument. The data that was used on this paper was based on the Digital Elevation Model (DEM) which is obtained from the remote sensing data (DEMNAS). This data has been used to simulate the inundation at several classes of height such as 50 cm, 100 cm and 200 cm. These had been overlaid by land use information. To validate the model, field observations were needed to obtain the actual information of inundation.

3. Results & Discussion

Based on the results, the affected areas of inundation are distributed in several villages in Dumai city which are of various spatial distribution. The higher the inundation height class, the wider the impact thus more areas are affected. The villages that experience a vast impact are Medan Kampai and Sungai Sembilan.

4. Conclusion

The areas that have been impacted by inundation are spatially distributed in several villages in the coastal area of Dumai city with different intensity.

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SCAFFOLDED MULTIMEDIA LEARNING APP FOR MALAYSIAN SIGN LANGUAGE

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Keywords: Sign language, Multimedia, Gamification, Scaffolding, Mobile.

1. Introduction

By 2050, it is estimated that over 900 million people or one in every ten people will suffer hearing loss [1]. According to the World Health Organization (WHO), more than 466 million people will be disable due to hearing loss. This scaffolded app based on gamification works as a tool to enhance learning skills by providing an appealing stage for the users to apply and practice what they learn in different levels of modules that are available including memory games.

2. Methodology

ADDIE model has been used while Unity 3D as the main authoring platform is used for the multiplatform games and offers interactive experiences. Scaffolded can be used as a principle and guideline to develop a good gamification application in sign language [2].

3. Results & Discussion

Based on sixty random selected respondents, 71.67% claimed the apps is easy to use and interesting. Good color harmony, matching font, consistent design and neatness are also impressive. Moreover, 75% of them claimed it is an effective learning method with persuasive experience. Module memory games create more interest with gamification elements.
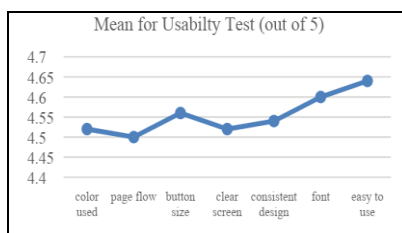
Figure 1. Mean for usability test
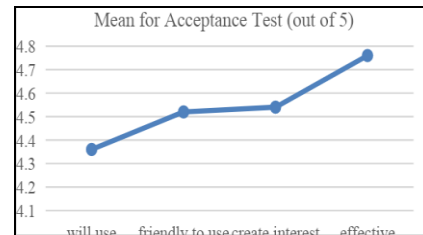
Figure 2. Mean for acceptance test

4. Conclusion

Implementing scaffolded multimedia with gamification elements can improve the learning process and become more effective.

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GROUP DECISION MAKING TOOLBOX

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Keywords: Group decision making toolbox, Preference similarity network, Clustering, Consensus, Ranking of alternatives.

1. Introduction

With multi-experts and alternatives, decision-making requires more time and effort. In this project, the Group Decision Making toolbox is developed to assist an efficient decision-making process.

2. Framework of the proposed model

This toolbox uses the main mathematical methodology introduced by Kamis et al. [1].

Figure 1. The framework of methodology used in constructing the Group Decision Making toolbox

3. The Toolbox

After the experts have evaluated all alternatives and order them accordingly, this toolbox presents the results, as in Figure 2.
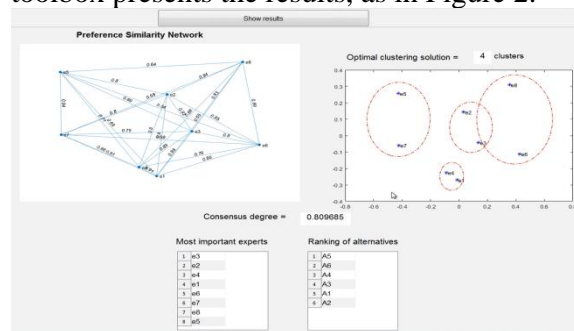
Figure 2. The final interface of the toolbox

4. Conclusion

Other than the identification of the best alternative, several additional information, such as the preference similarity network, the optimal clustering solution, the group consensus level, and the most important experts in the network are presented. By using this toolbox, the decision-making is completed with minimal computation time.

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MULTIPLE REFLECTIONS OF SPIRAL AND SPRING PASTA-LIKE CARBON NANOCOILS IN ABSORBING THE EMI WAVE

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Keywords: Reflection loss; Ferrites; Nanometer; Catalyst.

1. Introduction

The development of various electronic devices has created tremendous effect towards electromagnetic interference pollution. Nanomaterials have the advantages of having unique intrinsic properties that improve materials performance in various applications [1] which gives better interactions within gigahertz frequency range electromagnetic radiation.

2. Methodology

2.1.Synthesis of filler nanomaterials incorporated into epoxy matrix

Iron oxide (Fe_3O_4) and Cobalt ferrite ($CoFe_2O_4$)were prepared via mechanical alloying technique and further sintered at 1100 ^{0}C and 900 ^{0}C respectively.

The materials were mixed at a certain ratio and being used as a catalyst to grow carbon nanocoils by using chemical vapor deposition (CVD) method at 700 ^{0}C. The prepared samples were further incorporated into epoxy resin as matrix and further sent for materials's characterization.

3. Results & Discussion

Figure 1 shows FESEM image of as-synthesized carbon nanocoils by using mixed ferrite as the catalyst synthesized by CVD method.
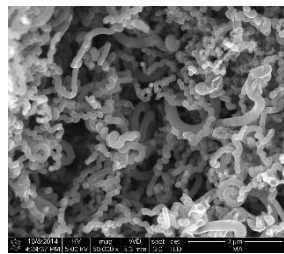
Figure 1. FESEM micrograph

4. Conclusion

The carbon structures formed consist of spiral, spring pasta-like and fewer straight carbon nanostructures that help in having multiple reflections in the sample. Currently, the materials are being prepared by using 3D printed structures.

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e-KubSis 2.0: STRATEGIZING MUSLIM CEMETERY IN MALAYSIA

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Keywords Cemetery management, Muslim cemetery, Cemetery management system, Database System Development Lifecycle (DSDLC).

1. Introduction

The common practice operated by related burial authority bodies and state religious councils in Malaysia have reflected the absence of a specific digital information system platform on the management of Muslims deceased [1],[2]. Consequently, the issues encountered by the cemetery visitors on the difficulties in searching the graves' plot of their heirs [2] as well as the issues on the projecting demand of burial space encountered by the councils are hardly addressed. Thus, e-Kubsis is expected to contribute to the councils and public service improvement by offering a potential solution towards all the above mentioned issues.

2. Methodology

2.1. Database System Development Lifecycle (DSDL)

The elements of the methodology are adopted mainly from Database System Development Lifecycle (DSDL).

3. Results & Discussion

e-Kubsis 2.0 is an enhanced functionality innovative prototype applying web based data management system to innovate Malaysian cemetery management system for Muslims deceased. Serve as a central source of burial information with visualization of cemetery plots as burial plots availability indicator, enables users for burial plots searching and identification and reservation as well as the deceased and related burial's data query.

4. Conclusion

e-Kubsis is expected to contribute to public service improvement and to support the efficiency and effectiveness of Muslim cemetery management performed by the burial authority councils of Majlis Agama Negeri in managing the cemeterial sites in Malaysia. As an implication, their ability in optimizing the burial plots in cemeteries will positively lead to an environmentally friendly interment.

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RESIDENTIAL REGISTRATION SYSTEM (ReRS)

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1. Introduction

The Residential Registration System or ReRS was developed to cater to the students' residential registration in UiTM Pahang. It is currently being used to assist registration in residential accommodation, which was beneficial during the pandemic due to the restrictions and tight Standard Operating Procedure (SOP). The seamless and digitalization system is crucial to be determined.

2. Methodology
2.1. ReRS Development

A seamless development procedure [2] by adopting the cloud-based environment [1] was used to develop ReRS. ReRs is most applicable during the pandemic and will promote digitalization and offer more benefits to organizations and customers [1][2]. ReRS adheres to the paperless and contactless registration measure as required by the Standard Operating Procedure (SOP). ReRS's objective is to complete the residential registration process in less than 300 seconds compared to the manual approach.

3. Results & Discussion

ReRS has been continuously implemented in UiTM Pahang, Raub campus to cater to more than 300 students in the first stage of college residential registration. The system can locate the room, student's details and produce registration reports seamlessly and systematically. The interface and performance of ReRS on time and cost saving are shown in Table 1 and Figure 1.
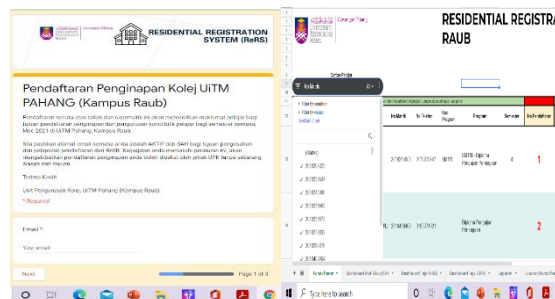
Figure 1. ReRS Interface

Table 1. ReRS Performances

Factors	Manual	ReRS	%
Time(hours)	175	29	**80**
Cost (RM)	875	175	**83**

4. Conclusion

ReRS can deliver significant positive performance that can support the current educational and operational requirements due to the pandemic.

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SEJOOK 2.0: THE REUSABLE TAMARIND COLD PATCH

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Keywords: Cold pack, Market potential, Preferences, Survey, Tamarind.

1. Introduction
The nutritional values of Tamarind (*Tamarindus indica L*) are well known [1], but its application to reduce body heat is still less recognized [2]. This opportunity has led to the development of *Sejook 2.0*: The Reusable Cold Patch.

2. Methodology
A survey was conducted to understand the preferences and market potential of *Sejook 2.0.*

3. Results & Discussion
A total of 92 respondents had answered the questionnaire through *Google Form* application. The demographic data shows 75% of respondents are female with background from 19-35 years old (88%), Government servants (31.5%), received a salary in the range of less than RM2,000 (57%) and had moderate daily life activity (57.6%).

The second section of the questionnaire survey was on the preferences and market potential of *Sejook 2.0*. 67.4% of respondents knew that tamarind is traditionally used to reduce body temperature and 53.3% had tried it before. In addition, 87% of respondents prefer natural remedies instead of synthetic products in the market. Most of the respondents moderately used cooling devices to reduce body heat, headache, and fever. In fact, 100% respondents agreed it is convenient in size, with 88% believing *Sejook2.0* could compete with existing products in the market. Finally, 80.4% respondents agreed *Sejook2.0* offers a reasonable price with the range of RM5.00-RM10.00 per pack of two.

4. Conclusion
The findings have shown that *Sejook2.0* has a great potential for commercialization and market values.

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JACKFRUIT (*Artocarpus heterophyllus*) PEEL PAPER

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Keywords: Jackfruit rind, Paper, Mechanical properties.

1. Introduction

Wood-based paper manufacture has caused environmental challenges such as deforestation, greenhouse gas emissions and wildlife habitat loss. This issue can be handled by employing jackfruit peel, a bio-waste material, as a raw source for paper making. The jackfruit (*Artocarpus heterophyllus)* peel (JFP) yearly production is about 2714 to 11,800 kg per tree. The jackfruit peel has a lot of advantageous properties due to its high fibre content, and fibre is vital in the papermaking process as a reinforcement in composite [1]. The goal of these works is to fabricate paper from jackfruit rind and to study its mechanical properties.

2. Methodology

JFP paper was fabricated using the following processes: material preparation, pulping, bleaching, and papermaking. In the fabricating process, sodium hydroxide pellets (NaOH, Aldrich, 99.99 percent purity) and hydrogen peroxide (H_2O_2, Alley, 30% purity) are utilized. Mechanical testing was used to determine the qualities of the JFP paper.

3. Results & Discussion

The mechanical properties of the fabricated JFP paper demonstrate that it has a strong dry tensile strength of 17.86 nm g^{-1} and a poor wet tensile index of 1.58 Nm g^{-1}. Tensile strength refers to a paper's ability to withstand loads without failing due to excessive stress or distortion. JFP paper has a tearing index of 7.61 N mm^{-1}. It demonstrates that JFP paper can withstand tearing forces. The bursting index value of 0.99 kPam^{2}g^{-1} indicates that the JFP paper has a high resistance to rupture. JFP paper has a low dry and wet strain, with a dry strain of 1.14% and a wet strain of 0.32 %, respectively. The tensile energy absorption (TEA) results are - dry and wet TEA is 0.53 Jm^{-2} and 0.01 Jm^{-2}, respectively. The TEA value represents the amount of work done when a sample is strained to tension rupture under specified conditions. JFP has poor property.

4. Conclusion

JFP paper has good mechanical qualities in terms of dry tensile strength, tearing index, and bursting index. It has low wet tensile strength, strain, and TEA characteristics. On the other hand, JFP paper can be used in place of wood-based paper because it is of comparable quality. Quality improvement efforts can be carried out for future study.

Acknowledgments

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SIRS: A SOLUTION TOWARDS MONITORING STUDENTS' PARTICIPATION DURING ONLINE DISTANCE LEARNING (ODL) IN UiTM CAWANGAN PAHANG

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Keywords: Information system, ODL, Monitoring, Student's participation, COVID-19.

1. Introduction
Due to Covid 19 pandemic, the Open and Distance Learning (ODL) has been tremendously implemented in universities around the world. This has imposed many new norms in human life, including in the education sector in Malaysia. Unfortunately, students' participation in ODL has become the main concern among educators [1]. Therefore, Students' Involvement Report System (SIRS) was developed to assist BHEA in retrieving non-participating students for each course, after investigation, reports were made by their respective lecturers.

2. Methodology
System development life cycle (SDLC) is a process of developing an information system or developing models that one can be used to build an information system [2]. The idea of SIRS fits comfortably into the enhancement of existing manuals for non-participating student's form.

3. Results & Discussion
Figure 1 shows the workflow development of SIRS using SDLC model.
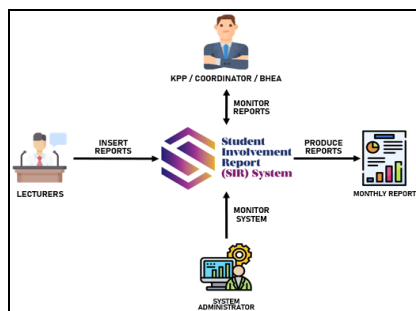
Figure 1. SIRS Workflow

4. Conclusion
SIRS can assist BHEA to conduct a proper investigation towards unresponsive students, Hence, BHEA will not miss out on any report lodged by course lecturers.

Acknowledgments

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La$_{0.8}$Na$_{0.2-x}$Li$_x$MnO$_3$ (x = 0 and 0.15) MANGANITES: NEXT GENERATION SPINTRONIC BASED DEVICES

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Keywords: Electroresistance, Manganites material, Resistivity.

1. Introduction

La$_{0.8}$Na$_{0.2}$MnO$_3$ manganite exhibits large reduction of resistivity in the presence of applied magnetic field which leads to the magnetoresistance, MR effect [1]. The similar reduction of resistivity was also reported in several manganite under the presence of different strength of applied current called electro resistance (ER) effect [2], hence revealing promising potential of manganite material for next generation spintronic based devices. It was suggested that magnetic inhomogeneity induced by Li substitution [3] is an important contributor for the enhancement of ER effect [2]. However, such suggestion is still under debate. Thus, current induced effect on the resistivity and ER effect in La$_{0.8}$Na$_{0.2-x}$Li$_x$MnO$_3$ are investigated to further elucidate this matter.

2. Methodology

La$_{0.8}$Na$_{0.2-x}$Li$_x$MnO$_3$ (x = 0 and 0.15) samples were prepared using solid state method. The resistivity was measured under applied current of I_1=1 mA and I_2=5 mA, respectively. The ER was calculated using Eq.1:

$$ER (\%) = \frac{\rho (I_1) - \rho (I_2)}{\rho (I_2)} \times 100 \qquad (1)$$

3. Results & Discussion

Resistivity, ρ decreased under applied current of 5 mA. The maximum value of ER recorded at 300 K which increased from 51% (x = 0) to 136% (x=0.15) indicates that Li$^+$ substitution significantly enhanced the ER effect.
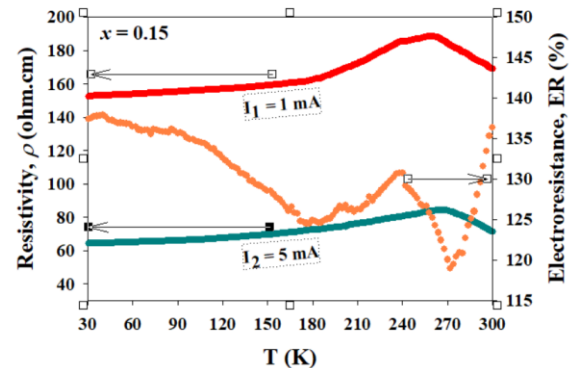
Figure 1. ρ vs. T curve under applied current of I_1 = 1 mA and I_2 = 5 mA, respectively and ER (%) vs. T curve for x = 0.15 sample

4. Conclusion

The observed enhancement of ER effect for x = 0.15 indicates improved sensitivity of the sample towards electric field.

Acknowledgments

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Swietenia macrophylla MEDICATED ACNE CREAM

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Keywords: Acne, Medicated cream, *Swietenia macrophylla,* Inhibition, Natural treatment.

1. Introduction

Acne is an ordinary and universal skin problem disease that occurs as early as adolescence. The skin acne causes painful, rooted cysts, pus-filled and permanent scars. Most acne problems are treated using antibiotics and drugs, and can be prone to acne resistance when overexposed to the drugs treatment for an extended period. In this work, the benefit of *Swietenia macrophylla* seed's oil extract (SM) was investigated as a new source of a natural acne treatment using a gas chromatography (GC-MS). The antibacterial activities of the identified compound were analysed using the Kirby Bauer Disc Diffusion (KBDD) method towards *Staphylococcus aureus, Staphylococcus epidermidis* and *Propionibacterium acnes* bacteria.

2. Methodology

2.1. GC-MS and KBDD Analysis

0.1 mL extract of *S. macrophylla* seeds extract was derivatized in 100 µL BSTFA for 30 min prior to GC-MS analysis. KBDD experiment was conducted by spreading the *P. aureus, S. epidermidis* and *P.acnes* using a sterile cotton swab on Mueller Hinton Agar. The disc dipped with the extract sample onto the agar was incubated at 37 ℃ for 24 hours. The antibacterial activity was measured by the diameter growth of the inhibition zone.

3. Results & Discussion

About 14 compounds were successfully identified with more than 90% quality as shown in Table 1. In addition, new compounds were also identified that show antifungal and antibacterial activities, which have not been reported elsewhere. The inhibition zone of the compound extracts in different solvents showed positive bacteria inhibition, as in Table 2. The inhibition area ranges between 11.0 – 21.67 mm, indicating that *S. macrophylla* extracts contain high antibacterial properties.

Table 1. Some chemical compounds in SM

Retention time (min)	Area (%)	Compound	Quality
1.925	25.84	Disiloxane,hexamethyl-	98
2.414	34.13	Acetamide,2,2,2-trifluoro-N-(trimethylsilyl)-	94
13.205	0.11	Phenol, 2-methoxy-4-(1-propenyl)-, (E	92
13.239	0.15	Eugenol	
14.988	0.12	Silane, [2-methoxy-4-(1-propenyl) phenoxy] trimethyl-	95 96

Table 2. Inhibition zone of acne bacteria

S. macrophylla extracts in different solvent	Zone of inhibition (mm) (n = 3)		
	S. aureus	*S. epidermidis*	*P. acnes*
Tetracycline	18.33±0.58	18.67±0.58	21.33±1.53
Methanol	20.67±6.03	18.67±14.15	16.33±5.69
Ethyl acetate	16.67±6.66	13.00±1.00	19.00±4.36
Methanol-ethyl acetate (1:1)	21.67±11.72	13.00±2.31	11.00±1.73

4. Conclusion

The *S. macrophyll*a seeds extract demonstrated inhibitory activities towards all tested bacteria and showed high commercial value as a natural acne medicated cream.

Acknowledgments

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JIGSAW PUZZLE ANIMATION METHOD ON LEARNING CHEMICAL EQUATION AND FORMULA

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Keywords: Jigsaw puzzle, Animation, Method, Chemical equation.

1. Introduction

A chemical equation consists of the chemical formulas of the reactants and the chemical formula of the products. The two are separated by an arrow symbol ($\rightarrow$, usually read as "yields") and each individual substance's chemical formula is separated from others by a plus sign. As an example, the equation for the reaction of hydrochloric acid with sodium can be denoted as,

$$2\ HCl + 2\ Na \rightarrow 2\ NaCl + H_2 \qquad (1)$$

This equation indicates that sodium and HCl react to form NaCl and H_2.

2. Methodology
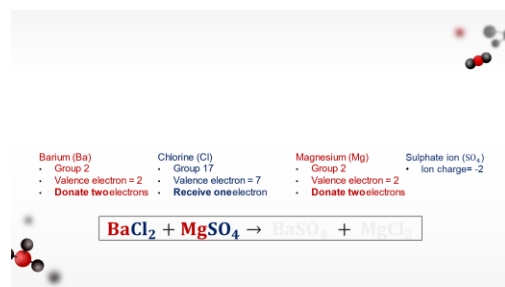
Figure 1. Write the chemical formula
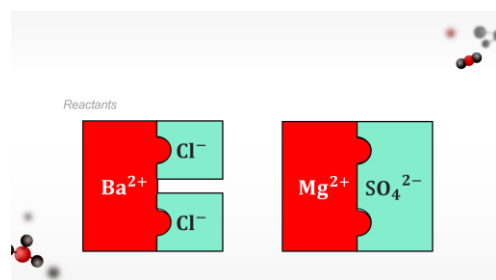
Figure 2. The Reactants
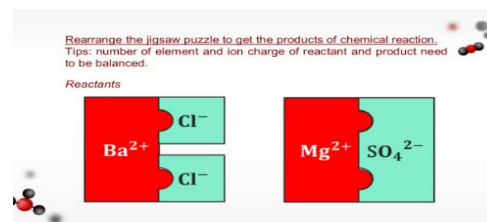
Figure 3. The Products

3. Results & Discussion

Traditional teaching methods on learning chemical equations and formulas are conducted both in schools as well as universities [1]. Generation Alpha, however, loves to play jigsaw puzzles. As such, we have designed one method for easy understanding and to be more interesting and approachable for students. It is named 'Jigsaw Puzzle Animation on learning chemical equations and formulas'.

4. Conclusion

The use of the Jigsaw Puzzle Method in teaching and learning can not only attract students to follow the next lesson but it is also able to help students master the skills of learning chemical equations and formulas better.

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GIRANG SAINS!

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Keywords: STEM, Game-based learning, Communication, Psychomotor.

1. Introduction

We were told science should be fun and exciting but the reality is, despite the past and current efforts, students still have little or no interest in STEM. This, in turn, could undermine the government's plan to create a nation of scientific & innovative people [1]. Here, we report an innovative program aimed at enticing students towards learning science, either in Biology, Chemistry, Physics, and Mathematics. The target of the program are students from lower secondary school. The games in the program are designed with the objective that the students will have fun in learning the STEM subjects, through outdoor problem-solving activities with their friends or teammates which can enhance students' communication and psychomotor skills.

2. Methodology

The game or activities are station-based. The students cum participants will be separated into groups. The ideal number of participants in a group is four. One mentor will be assigned to each group. The participants will be guided to find clue cards which are hidden at specific places. The clue cards will then be passed to a "gatekeeper" before answering questions at designated stations. The participants can answer the questions within the allocated time. Once answered, they will move to the next "station" for the next round of the game. Total marks will be calculated, and there will be a finale in the form of a quiz. Questionnaire will be given at the end of the session to gather inputs for analysis.

3. Results & Discussion

The program is still at the planning stage as the project kickstart has been delayed by the Covid-19 pandemic. Having said that, the questions and related analysis are ready. The analysis will be performed on the knowledge, enjoyment, and engagement levels. The analysis, which will be based on the Wilcoxon signed-ranks tests, the effectiveness of the program in cultivating the fun factor, while learning science subjects, can be evaluated.

4. Conclusion

The program "Girang Sains" is developed with the objective to revive the flagging interest of the students in study sciences. Work is currently underway in converting the elements in the program into apps, where the students can join the programs from their home, just with mobile phones and internet connection.

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ANIMAL HAZARDS ROAD PROFILE (AnizardsPro) APP

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Keywords: Animal, Hazards, Road profile, Mobile application.

1. Introduction

Collision between animals and vehicles is one of the many common accidents. These accidents not only cause damages to vehicles but also injuries and claim lives. These types of accidents occur when the animals suddenly appear on the road [1]. The risk increases if the roads are constructed along animal habitat patches. Thus, AnizardsPro app is developed, so that animal collisions impacts can be minimized. This mobile app will indicate and display the hotspots of animal collisions. When the road users pass through these spots, they need to take extra precautions to avoid collisions. The local authorities can plan and take mitigation measures at these hotspots.

2. Methodology

Profiling begins with the identification of carcasses prone locations. Then, the dead animal will be categorised according to mass, speed, and endangered species for the purpose of hazard stretch color-coded in the map. The color-coded is based on animal hazards chart which classified high to low collision risk via colour [2]. Road speed limit and 2 seconds response time are factors to be considered in estimating the stretch distance. Updated animal hazards profile maps are displayed in the app.

3. Results & Discussion

Figures below show the flow on how the end product (animal hazards profile map) after production is displayed in AnizardsPro app for road users usage.
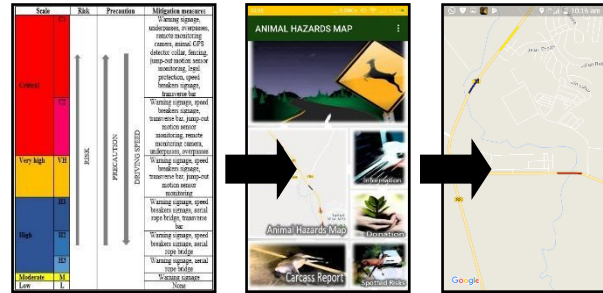
Figure 1. Animal hazards chart

Figure 2. AnizardsPro app

Figure 3. Animal profile hazards map

4. Conclusion

Besides animal hazards profile maps, other features are carcass reports to link to related local authorities, artificial intelligence for carcass recognition and links to animal NGO. AnizardsPro app is a practical measure for mitigation of the collision between vehicle-animals due to its user-friendliness and low cost.

Acknowledgments

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KALUMINA: POTASSIUM BASED ALUMINA SUPPORTED CATALYST FOR BIODIESEL PRODUCTION

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Keywords: Bead catalyst, Biodiesel, Potassium-based, Transesterification, WCO.

1. Introduction
Biodiesel is known as one of the most promising renewable and biodegradable large-scale biofuels manufactured in many countries using method in [1]. Potassium carbonate (K_2CO_3) has high activity on transesterification reactions and is found to be suitable for all feedstock of low free fatty acids (FFA).

2. Methodology
2.1. Catalyst preparation
The K_2CO_3/Al_2O_3 powder and bead catalyst with 10% concentrations were prepared by incipient wetness impregnation method on an alumina oxide (Al_2O_3) powder and bead in an aqueous salt solution.

3. Results & Discussion
3.1. X-Ray Diffraction (XRD) Analysis
Powder catalyst shows crystalline structure which leads to smaller surface area while beads catalyst indicates an amorphous structure with an aggregation of particles with larger surface area which makes beads catalyst offer more yield in biodiesel production.
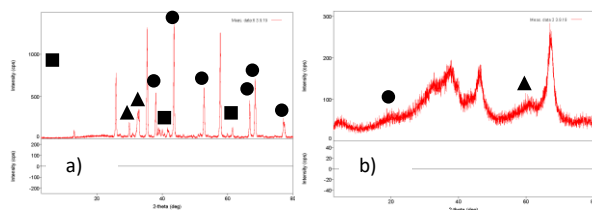
Figure 1. The XRD patterns of K_2CO_3/Al_2O_3 a) powder and b) beads catalyst

Table 1. Biodiesel yield of 10% K_2CO_3/Al_2O_3 powder and bead catalyst

Catalyst	Biodiesel Yield (%)			
	1 hour	2 hours	3 hours	4 hours
K_2CO_3/Al_2O_3 (powder)	64.75	89.07	89.50	87.08
K_2CO_3/Al_2O_3 (beads)	99.34	99.48	78.61	82.03

4. Conclusion
Beads K_2CO_3/Al_2O_3 catalyst shows higher biodiesel yield at 2 hours reaction time compared to powder K_2CO_3/Al_2O_3 catalyst.

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CATEX: CATALYTIC EXTRACTION OF ACIDIC PETROLEUM CRUDE OIL

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Keywords: Catalytic extraction, Crude oil, Naphthenic acids.

1. Introduction

The high acidity in crude oil can lead to major corrosion to the oil processing equipment in the petroleum industry due to the presence of naphthenic acids (NAs) in the crude oil [1]. Therefore, the removal of NAs is regarded as one of the most important issues to the oil and gas industries.

2. Methodology

An innovation of catalytic extraction (CatEx) technique was introduced utilizing 2-metylimidazole in ethanol with the aid of Ca/Al_2O_3 catalyst to meet PETRONAS requirement of total acid number (TAN) less than 1 and satisfy the world petroleum TAN standard of less than 0.5 mg KOH/g simultaneously that was measured by ASTM D664 method.

3. Results & Discussion

Figure 1 shows the rough surface morphology of Ca/Al_2O_3 catalyst with inhomogeneous spherical shape and comes with a mixture of small and large particle size.

4. Conclusion

The catalyst of Ca/Al_2O_3 has successfully reduced the original TAN from 4.38 to 0.46 mg KOH by meeting the PETRONAS requirement which must be less than 1 mg KOH/g.
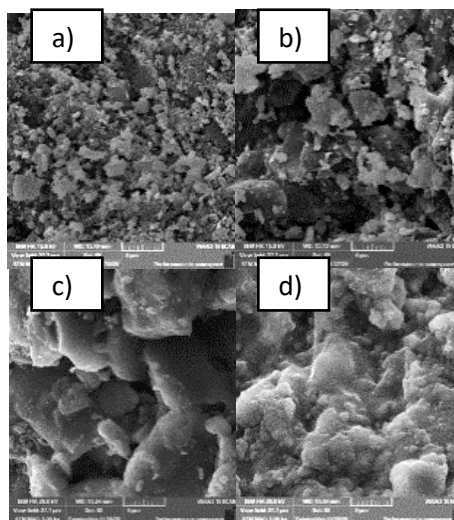
Figure 1. SEM micrographs of Ca/Al_2O_3 at different calcination temperatures a) 700ºC, b) 900ºC, c) 1000ºC and d) after using a catalyst at 1000ºC with 5000X magnification.

Acknowledgments

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PHYSICAL CHANGES OF CRESOL RED-DYED POLYHYDROXYETHYLMETHACRYLATE (PHEMAG) TO RADIATION

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Keywords: Cresol red, Polymer gel, Photon beam, Stability.

1. Introduction

Blends of solid polymers and dyes are used as indicators of the physical response of films to gamma radiation in the sterilization and disinfection industry [1]. Irradiation response of the mixture of polyhydroxyethyl methacrylate gel (PHEMAG) and cresol red dye will cause monomer polymerization and colouring of cresol red dye, which has great potential for the application of 2D and 3D dosimetry to the quality assessment of radiotherapy.

2. Methodology

Several batches of polymer gel that are doped with cresol red dye with varied monomers (HEMA) concentration in correspondence to the UV absorption are analysed before and after irradiation of 6 MV photon beams at a constant rate of 300 Gy/min.

3. Results & Discussion

As the given amount of absorbed dose increases, more discolouration of PHEMAG stained with cresol red is caused, as shown in Figure 1. The physical changes of cresol red-dyed PHEMAG shows a change from red-orange (pristine) to orange (irradiated) [2]. In Figure 2, the absorbed dose based on the degradation percentage (%) in 19 days corresponds to the stability before and after irradiation.
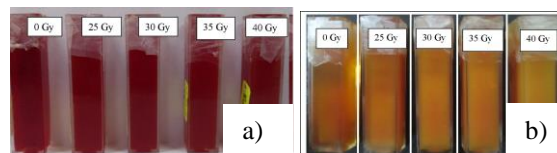
Figure 1. Cresol red dyed PHEMAG a) before irradiated, b) after irradiated.
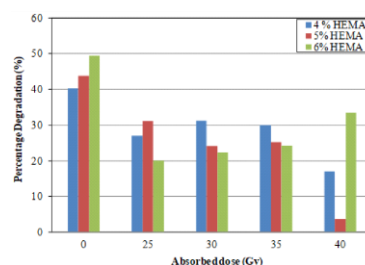
Figure 2. Pre and post irradiation stability

4. Conclusion

In conclusion, the physical and stability responses of irradiation have greatly led to the use of the gelling agent to maintain the polymer aggregated (3D distribution) for the post irradiation.

Acknowledgments

The authors would like to thank the lab staff for assisting with the lab analysis.

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PALM KERNEL SHELL (PKS) REFLEXOLOGY

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Keywords: Livestockfeed, Nutrition, Sugarcane waste.

1. Introduction

Oil palm waste basically led to a bigger disposal issue. Minimizing via recycling, recovering energy, and finally disposing of waste are certainly the main principles of waste management [1]. Palm Kernel Shell (PKS) is a waste that is practical to be used and has environmental benefits such as resource preservation. PKS is utilized in the various forms of applications for both technical and environmental benefits varying from energy production, composite matrix, additive, reinforcement, aggregation and water purification.

2. Methodology

Five samples of PKS reflexology tile had been prepared with a different percentage of PKS waste (0% - 40%) in a concrete mixture and dried for 28 days. The weight of each sample was obtained (kg) using normal weight scale and the volume of sample was at a fixed value of 0.0072 m^3. The density of each sample is calculated with formula weight (kg) divided with volume (m^3). Meanwhile, for the production process, the PKS was transformed into an oval or circular shape. This is made after producing a mixture of blended sand, PKS and cement.

3. Results & Discussion

Based on Table 1, the lightweight PKS reflexology tile recorded was 30% and 40% of PKS mixed in the concrete mixture with density values of 1875 kg/ m^3 (30%) and 1647 kg/ m^3 (40%). Lower weight of the tile will contribute to the concrete's lower density. PKS concrete with 50% of PKS percentage considered as lightweight with 2000 kg/ m^3 of density [2].

Table 1. Density of PKS reflexology path sample with different percentage of PKS waste.

Sample	Amount PKS (%)	Weight (kg)	Volume (m^3)	Density (kg/m^3)
A	0	17.078	0.0072	2372
B	10	15.552	0.0072	2160
C	20	14.81	0.0072	2057
D	30	13.5	0.0072	1875
E	40	11.858	0.0072	1647

4. Conclusion

The study is expected to value waste as a method of converting waste to wealth. The product will also help to eliminate the enormous solid waste produced by poor agricultural waste disposal.

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UPIK DATA DEPOSITION SYSTEM: THE NEW WAY OF RECORDING STAFFS'EXPERTISE DATA SYSTEM

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Keywords: Data deposition system, Innovation, Income generation, Consultation.

1. Introduction

The new National Policy on Science, Technology & Innovation underlines the foundations for Malaysia to become a competitive and competent country [1]. University is a place for knowledge and expertise, and as a key component under the policy for nation-building, must be nurtured for further development. In line with the government policy mentioned above, UiTM Cawangan Perlis Kampus Arau have set up a unit, known as *Unit Pengurusan Inovasi & Kepakaran* (UPIK) under PJIM&A. UPIK is responsible for tapping the potential of the staffs' expertise in giving workshops that generate income, encouraging participation in innovation competitions, and helping to advise on the consultations that staffs involved. With the main task of UPIK having to manage the staffs' expertise, a system that can facilitate the handling of the records from the staff in above-mentioned areas is welcomed with open arms.

2. Methodology

The record-handling system, known as UDDS (UPIK Data Deposition System) consists of three parts, namely "Innovation", "Income", and "Consultation", which, as the name implies, cater to the needs of UPIK. Within each part, a Google Form will be created, in which the staff will be able to fill in the information needed. The information will be recorded, and then grouped as data in the Google Drive with UPIK as the caretaker. With the use of Google Form, all the information needed is not only easy to collect but also can be extracted out in Excel sheets. Manual checking must be performed on the information deposited in the system.

3. Results & Discussion

UDDS is a one-stop data center for UPIK. The existence can reduce the anxiety for UPIK and to increase its efficiency in providing information for relevant interested parties. For example, in awarding the most outstanding innovator in the campus, the faculties that have participated in the income generation, consultation, just to name a few. Universities, too, can use the data to gauge the performance of the campus. With this data deposition system, all information in these three areas is well recorded and accessible whenever needed.

4. Conclusion

UDDS is created to cater the needs of many parties: university, staff, and the government-related agencies. With the system in place, UPIK can focus on the other given tasks, for example, to find collaborators to commercialise or market innovation products of the staff.

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INTUITIONISTIC FUZZY TIME SERIES FORECASTING MODEL: PRESERVING THE NATURE OF DATA

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Keywords: Intuitionistic fuzzy sets, Forecasting model, Fuzzy time series.

1. Introduction

The time series forecasting model cannot cater for historical data in linguistic values. The knowledge of fuzzy set theory [1] and intuitionistic fuzzy set (IFS) [2] has the ability to overcome this issue. However, the existing IFS forecasting models do not fully utilize the membership and non-membership values. Therefore, this forecasting model is proposed to preserve the uncertainty which are the membership and non-membership values throughout the forecasting procedure. This forecasting model uses automated calculation via Microsoft Excel commands.

2. Methodology

Crispification approach is used to convert the IFS into crisps. The data are forecasted using several steps which are simplified using Microsoft Excel commands. The forecasting model is applied in the Malaysian crude palm oil prices data.

3. Results & Discussion

Figure 1 displays the actual and forecasted output. The performance of the proposed model is compared with other methods as shown in Table 1.

Figure 1. Actual and forecasted prices.

4. Conclusion

The IFS has its advantages in giving better forecasting results since it considers the hesitancy degree. The usage of crispification preserves the nature of IFS and the calculation using Microsoft Excel commands makes forecasting more efficient and accurate.

Acknowledgments

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Table 1. Comparison of forecasting performance

Methods	MAE	MSE	RMSE
Crispification (Proposed)	89.23	19846.13	140.88
Midpoint Method	106.93	22181.48	148.93
Frequency-Midpoint Method	107.57	23526.13	153.38

*MAE: Mean Absolute Error, MSE: Mean Square Error, RMSE: Root Mean Square Error.

EFFICACY OF NATURAL PLANT EXTRACTS ON GROWTH PERFORMANCE OF *Capsicum frutescens*

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Keywords: Oriental herbal nutrient, Organic plant booster, Growth parameters, *Capsicum frutescens*.

1. Introduction

Capsicum frutescens or Chili is commercially grown in Malaysia. This crop has an extensive use of chemical fertilizers. The consumer is now aware of the adverse effects of inorganic crops and the benefits of organic food. With the current pandemic COVID-19, working from home is vaunted as the "new normal". People tend to do home gardening involving growing vegetables and herbs for personal consumption. Oriental herbal nutrient (OHN) is an organic plant booster from the mixture of herbs that help in plant growth. The present study is conducted to evaluate the effects of OHN on the growth of *C. frutescens*.

2. Methodology

OHN were prepared from the extracts of cinnamon bark, ginger, and garlic (Kim et al., 2014). The fermented OHN was weekly applied to *C. frutescens* via foliar spray, starting two weeks after transplanting until harvesting. The experimental design layout was a complete randomized design with four treatments and three replications. The growth parameters; number of flowers, number of fruit set, and fresh weight, were recorded. Statistical analysis was conducted with SPSS software and means were separated using LSD ($p \leq 0.05$).

3. Results & Discussion

C. frutescens sprayed with OHN from cinnamon bark had 68.4% higher in the number of fruits set as compared to NPK (Table 1). The result shows that OHN from cinnamon bark is able to produce heavier fruit.

Plant herb extracts exhibited fungicidal and bactericidal abilities. Previous study highlighted that garlic essential oil has an insecticidal effect on the pests of horticultural crops [1]. OHN acts as a pest repellent, thus plants treated with OHN tend to have prominent growth. In this study, chili treated with OHN of cinnamon bark was able to promote flowering with a higher number of flowers and fruits set as compared to NPK fertilizer.

Table 1. Effect of OHN on the number of *C. frutescens* fruit sets and fresh weight

Treatments	Number of fruit sets	Fresh weight(g)
T1(NPK fertilizer)	19[bc]	12.50[ab]
T2 (OHN- cinnamon bark)	32[a]	14.83[a]
T3(OHN-ginger)	16[c]	11.08[b]
T4 (OHN - garlic)	26[ab]	12.25[ab]

4. Conclusion

In conclusion, OHN from cinnamon bark showed positive effect on chili growth performance, thus it can be practiced in substituting the NPK fertilizer in growing *C. frutescens*.

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FOOT MASSAGE RUBBER PAD FROM NATURAL RUBBER LATEX/DURIAN SKIN FIBER BLENDS

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Keywords: Foot massage, Natural rubber, Durian skin fiber.

1. Introduction
Durian has played an important role in Thailand's economy. It has been steadily consumed in both types of fresh fruits and fruit products. Unfortunately, durian causes a lot of wet garbage that could be valueless. Therefore, in increasing the benefit of durian skin, it is prepared into small fibers and blended with natural rubber. As durian skin fibers are hard and of rough natural fiber, they can easily be mixed with natural rubber which has good elasticity and soft properties. The final blends can be moulded to be foot massage rubber pad that could improve blood flow circulation, deep kneading and relaxing for users especially the elderly people or peripheral neuropathy.

2. Methodology
The preparation of durian skin fiber started from the collection and cleaning to remove any dirt. Then, it was cut into small pieces and put in a blender to crush and get the appropriate fiber size range. The fibers were completely dried at 70°C in the oven. Next, durian skin fibers were mixed with the prevulcanized rubber latex until homogeneous blend. The blend was formed into a foot massage rubber pad and put in the oven to dry at 70°C. Finally, the foot massage rubber pad was colored for better appearance.

3. Results & Discussion
Figure 1 shows the final foot massage rubber pad which is made from natural rubber latex and durian skin fiber blends. There are many points which produce acupressure on tight muscles. The rough and rigid durian skin fibers together with soft rubber assist to better feeling on foot skin. These could be helpful to improve circulation, stimulate muscles, reduce tension and often ease pain.
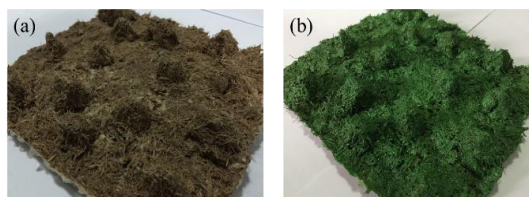
Figure 1. Foot massage rubber pad before (a) and after (b) coloring

4. Conclusion
Foot massage rubber pad can be perfectly prepared by blending between natural rubber latex and durian skin fiber.

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SANDYP: FUTURE GREEN POFA SAND FOR IBS

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Keywords: Green material, Sand, Palm oil fuel ash, Mortar, IBS.

1. Introduction

Palm Oil Fuel Ash or known as POFA is a waste product from the oil palm industry. It creates issues where waste is being dumped in landfills and causes an environmental pollution problem [1]. The potential of POFA as an alternative to normal sand had been studied. This project focuses on producing future green POFA sand, SandyP which promotes a simple and innovative solution. It is a readymade pre-packaged product only for Industrialised Building System (IBS) and single users worldwide.

2. Methodology

POFA was supplied by United Oil Palm Industries Sdn. Bhd. Nibong Tebal, Pulau Pinang. It was dried in the oven for 24 hours at the temperature of 100 °C. POFA was sieved to 212μm size and added to mortar mixtures at different sand replacement levels. Experimental works had been done through flow tests and compression tests.

3. Results & Discussion

Mortar mixtures of control, POFA5 and POFA10, increased in strength while POFA15 and POFA20 decreased in strength. This is due to the larger surface area of POFA. As the amount of POFA as partial sand replacement increased, it resulted in the mortar mixed requiring a higher amount mortar mixed decreased the cohesion between the materials in the mortar which produce mortar with lower strength. Mortar containing POFA improves the compressive strength at 7 days as shown in Figure 1.
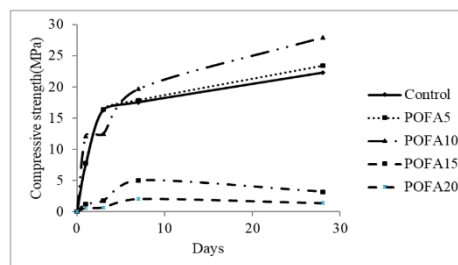
Figure 1. Compression test result

4. Conclusion

The particle size of the POFA contributes towards the workability of the fresh mortar. 10% POFA is the optimum percentage of POFA to be utilized in mortar where the compressive strength was increased as the curing periods increased.

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50 COMMON MISTAKES IN C++: DISCOVER THE MISTAKES TO PREVENT MISTAKES

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Keywords: Introductory programming, C++ language, Syntax error, Novice programmer, Common mistakes.

1. Introduction

Debugging is an important step in programming because it allows programmers to evaluate and correct potential errors in the source code to ensure that the programme works properly. Kaczorowska [1] discovered that most first-year students struggled with syntax errors while learning the Java programming language. This is supported by Perez [2], who stated that identifying errors in programming languages is difficult and time-consuming. Therefore, this research identifies and classifies the types of common mistakes made by novice programmers in C++ programming language.

2. Methodology

The taxonomy approach was adopted for the study, and it consists of five steps: organising related categories, identifying groups, detailing subgroup information, developing taxonomy, and finally turning the taxonomy into a book.

3. Results & Discussion

The results of this study include a taxonomy of common C++ language errors and a book that incorporates the taxonomy into detailed content and explanation. 14 groups were discovered, and a total of 50 sub-groups that reflected common C++ errors. These are the groups: 1)Variable or identifier concept, 2)Mathematical Expression, 3)Reserved word, 4)Char versus string, 5)Selection, 6)Compound block, 7)Switch statement, 8)Repetition control structure, 9)Input and Output stream, 10)Function, 11)Operator '=' versus '==', 12)Misuse of semicolon, 13)Condition statements, and 14)Single dimensional Array.

4. Conclusion

The 50 common mistakes taxonomy, which has been turned into a book, has been commercialised and is being used by students. The book assists programmers in comprehending errors and deciding how to correct them, and it can also speed up the learning process. This project discovers 50 common mistakes to prevent further mistakes.

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EVALUATION OF VITAMIN C IN *Paederia foetida*

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1. Introduction

Paederia foetida, from a Rubiaceae family, is widely found in Asian countries including Malaysia, India, Vietnam, Myanmar, and Japan. Its common names are skunk vine, stink vine, or Chinese fever vine. Malay people call this plant "pokok sekentut" because of its stinky smell produced when the leaves are crumpled [3]. *P. foetida* is extensively used in traditional medicine for the treatment of stomach disorders [2]. This plant has varying biological properties such as antioxidant, anti-microbial [1] and antidiabetic [3]. However, the analysis of vitamin C in local species of *P. foetida* has not been thoroughly investigated. Therefore, this study was conducted to analyse the vitamin C content in the twigs and leaves of *P. foetida.*

2. Methodology

The leaves and twigs of *P. foetida* were collected in Pasir Mas, Kelantan, Malaysia. The vitamin C content in fresh leaves and twigs of *P. foetida* were analysed using isocratic High-Performance Liquid Chromatography (Waters 2487).

3. Results & Discussion

According to the RNI, the recommended intake for vitamin C is only 70 mg/day. The vitamin C amount from the twigs and leaves of *P. foetida* are shown in Table 4.1. The table shows that the twigs have higher concentration of vitamin C than the leaves.

Table 1. The ascorbic acid (AA) content in *P. foetida*

Sample	Ascorbic acid (AA), mg/Kg
Leaves	50.06
Twigs	298.69

4. Conclusion

This result proved that this local species has the potential to be further studied to assess its medicinal properties as it contains high amounts of vitamin C.

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COLORIMETRIC SENSOR FOR IRON DETECTION

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Keywords: Naked-eye, Purple sweet potato, Anthocyanin, Fe^{3+} detection, Natural agent.

1. Introduction

Colorimetric sensors are one of the popularly investigated methods. Various reagents are used as chelating agents for quantification of metal ions. They must be synthesized and they are usually not environmentally friendly. Moreover, the synthesized compounds would be costly. This work is a simple, green and inexpensive colorimetric sensor to determine Fe^{3+} using anthocyanins as a chelating agent. This was investigated in terms of both quantitative and qualitative detections. The aim of this work was to study the various parameters of detection.

2. Methodology

All chemicals used in this research were analytical reagent grade. Anthocyanins was extracted from the purple sweet potato which is a local plant in Thailand.

3. Results & Discussion

The sensor was based on the interaction between Fe^{3+} and the chelating agent causing the color change from green to brown and can be easily observed by the naked-ked eyes. It was found that Fe^{3+} responded with the color change between pH 4-12 (Figure 1).

Figure 1. The color changes with the Fe^{3+} concentration at different pH

Under the optimal conditions, 100 µl of pH11 buffer, 40 µl of Fe^{3+} metal solution and 20 µl of anthocyanin solution, the lowest concentration of Fe^{3+} are able to be detected by the naked-eye was at 30 ppm without any interfering effects (Figure 2).
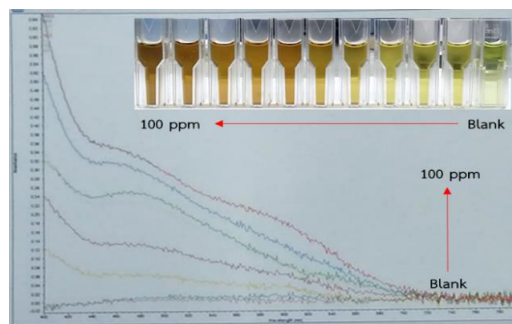
Figure 2. Calibration curves of colorimetric sensor in a series Fe^{3+} concentration from 0.0 to 100 ppm.

4. Conclusion

This work presents a simple and green Fe^{3+} detection mechanism. Qualitative and quantitative research approaches were both carried out. The proposed method can be applied for real water samples for its simplicity, rapidity, low cost and environmental safety features.

Acknowledgments

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UiTM FLEXIBER

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Keywords: Flexibility, Sit and reach, Trunk extension.

1. Introduction

Flexibility refers to the ability of our joints to move through a full range of motion [1]. Having flexibility in our muscles allows for more movement around the joints [2]. The improved flexibility produces a wide range of physical benefits and can have a positive effect on our health [3].

2. Methodology

The purpose of UiTM Flexiber is to produce testing measurements, which will be able to measure the level of flexibility of athletes and students. UiTM Flexiber is equipped with two tests in one equipment which measure the flexibility of hamstring and trunk.

3. Results & Discussion

It is easy to install and carry, space saving, inexpensive, and produces results immediately. UiTM Flexiber will also be able to provide a good reference to the coaches in sports and teachers at school for their training program schedule and health component testing (flexibility).
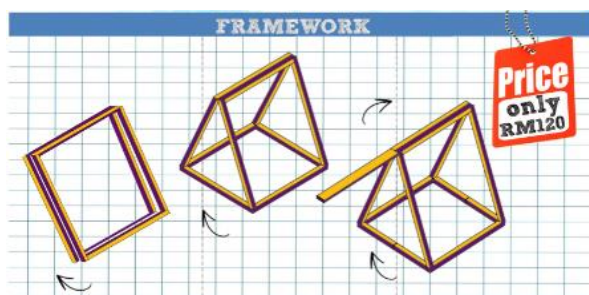
Figure 1. The measurement details of UiTM Flexiber.
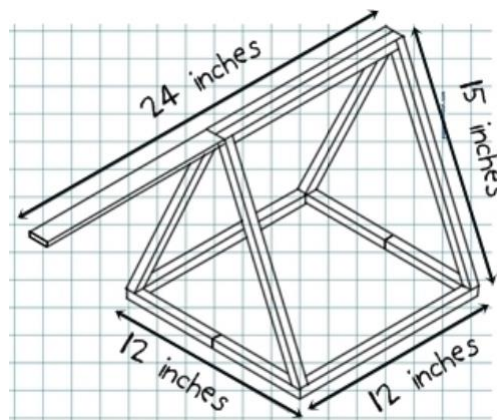
Figure 2. Folding steps for UiTM Flexiber (space saver) with affordable price.

4. Conclusion

UiTM Flexiber is a good equipment to measure the flexibility of the hamstring and trunk of a human. It also has a few advantages compared to the already available flexibility testing equipment.

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EFB BIOCHAR GREEN FILLER

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Keywords: Empty fruit bunch, Biochar, Green filler, Polypropylene, Composites.

1. Introduction

Most agricultural waste is not fully utilized but often burned or left to decompose naturally. The disposal of agricultural wastes without any reduction in intensity produces greenhouse gas, which affects the environment and its climatic conditions. One of the most abundant residues is empty fruit bunch (EFB), which are left behind after the removal of oil palm fruits in the oil refining process. The EFB can be converted into a useful and low-cost material called biochar through the pyrolysis process [1]. In this work, biochar from oil palm empty fruit bunch fibre (EFB) was used as reinforcing filler in polypropylene composites.

2. Methodology

In producing the biochar, the pyrolysis time took approximately 2 hours and the temperature of this process is initiated at 600°C. The biochar and PP are blended using a mill mixer at the temperature in the range of 190°C-200°C with mixing time of 11 minutes and screw speed of 40 rpm.

3. Results & Discussion

The effects of biochar on the mechanical and thermal properties of the composite were investigated. Results reveal that the inclusion of biochar enhances thermal properties whilst having no detrimental effect on the mechanical properties. According to DSC analysis, the degrees of crystallinity of the composite increased as the amount of BC loadings increased.
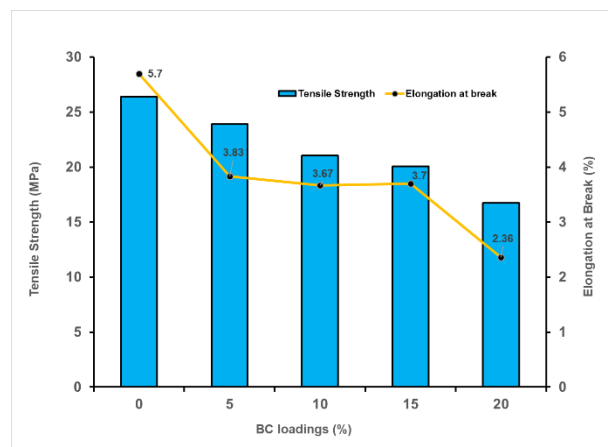
Figure 1. Tensile Properties of composites with different BC loadings

Table 2. Thermal Analysis data for composites

Sample	Melting Temperature (°C)	X_c (%)
0% BC	153	36
5% BC	155	45
10%BC	157	47
15%BC	160	51
20%BC	156	40

4. Conclusion

EFB biochar green filler has enhanced the thermal properties of the composites. Thus, it would be one of the potential fillers in polymer composites.

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SEASHELL POLYPROPYLENE BIOCOMPOSITES

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Keywords: Seashell, Polypropylene, Biocomposites, Thermal analysis.

1. Introduction
Polypropylene (PP) is a commonly utilised polymer with a diverse range of applications spanning from household appliances to the automotive industry [1]. However, PP is derived from petrochemicals which may pose environmental problems due to its non-biodegradability. Therefore, growing efforts have been evolved to develop composites based on bio-fillers. Seashells (SS) have a high amount of calcium carbonate that may be suitable to replace commercial filler in polymer composites. This work is aimed to fabricate the PP/SS biocomposites and study their thermal properties.

2. Methodology
The SS was washed, boiled for a few minutes in hot water, then dried in a 110°C oven for 2 hours. The SS were crushed and blended into a fine powder and then sieved to obtain an average particle size of 212μm. PP mixed with SS powders (30 wt%) were melt-blended in a mixer machine to obtain PP/SS biocomposites. Thermal analysis was used to determine the performance and quality of the product.

3. Results & Discussion
As illustrated in Table 1, the thermal decomposition of the PP and SS occurs in a single step with transition temperatures ranging from 220°C to 442°C and 610°C to 815°C, respectively. The temperature ranges for the PP/SS decomposition phases were from 243°C to 447°C for step I and 652°C to 766°C for step II. The maximum peaks of the transition temperature for these processes were 433°C and 737°C, respectively. The percentages of the weight loss composites at corresponding transitions were 72% and 13%, respectively.

Table 1. The decomposition temperature of PP, SS and PP/SS biocomposites

Sample	Step	T_{range} (°C)	T_{max} (°C)	Weight Loss (%)
PP	I	220 - 442	430	83
SS	I	610 - 815	800	42
PP:SS	I	243 - 447	433	72
(70:30)	II	652 - 766	737	13

4. Conclusion
In this work, PP/SS biocomposites were successfully fabricated using melt-blended processes. The TGA results indicated that the addition of SS increased the thermal decomposition temperature of the sample, hence improving the thermal stability of the biocomposites. The use of seashell trash as a biocomposites resource could prove to be a viable industrial scale-up solution.

Acknowledgments

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GET: A SOLUTION FOR INDUSTRIAL WASTEWATER TREATMENT

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Keywords: Electrocoagulation, Germicidal, Wastewater, Industry, Environment.

1. Introduction

Chicken slaughterhouses require plenty of water to clean bloods, feathers and other unwanted residues during the processing stage. Hence, a large amount of wastewater that consist of many pollutants will be produced at the end of the process mostly as stream discharge. This sequence will be continuously repeated thus giving some negative impacts to the environment [1]. Therefore, an electrocoagulation (EC) process was used in this study to treat wastewater from chicken slaughterhouses. The colour removal percentage of the treated wastewater was determined by detecting the absorption value of sample under EC at different conditions i.e.; types of electrodes, amount of voltage, operating time, and initial pH of wastewater. The λmax absorbance of the wastewater was verified manually with the maximum absorbance at 345 nm. The optimum condition for EC treatment was at EC5-1 which used Al-Al electrode set, 24 V, 5 min operating time and pH 6 of initial pH where the percent removal of this parameter condition has shown the highest value (95.88 %) as compared with others. Moreover, it also underwent the pre-treatment process applied prior to EC at an optimum condition. The pre-treated wastewater (EC5-1) is more efficient compared to the non-pretreated (EC5-2) as both colour removal efficiencies are at 95.88 % and 93.37 % respectively.

2. Methodology
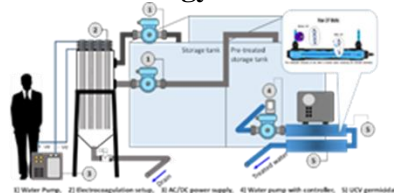
Figure 1: The GET system setup

3. Results & Discussion

Table 1 Overall data of optimum condition parameters in EC process under colour removal of slaughterhouse wastewater.

Condition	Cathode type	Anode type	pH	Voltage (V)	Operating time (min)	Absorbance value	Removal efficiency (%)
EC1-1	Al	Al	5	3	5	0.415	75.19
EC1-2	Al	Fe	5	3	5	0.801	52.12
EC1-3	Fe	Al	5	3	5	0.572	65.81
EC1-4	Fe	Fe	5	3	5	0.987	41.00
EC2-1	Al	Al	5	6	5	0.334	79.36
EC2-2	Al	Al	5	12	5	0.233	85.60
EC2-3	Al	Al	5	18	5	0.185	88.57
EC2-4	Al	Al	5	24	5	0.181	88.81
EC3-1	Al	Al	5	24	1	0.420	73.96
EC3-2	Al	Al	5	24	2	0.238	85.24
EC3-3	Al	Al	5	24	3	0.223	86.17
EC3-4	Al	Al	5	24	4	0.185	88.53
EC3-5	Al	Al	5	24	5	0.181	88.78
EC4-1	Al	Al	2	24	4	10.806	89.19
EC4-2	Al	Al	4	24	4	6.433	93.57
EC4-3	Al	Al	6	24	4	5.497	94.50
EC4-4	Al	Al	8	24	4	13.679	86.32
EC4-5	Al	Al	10	24	4	45.097	54.90
EC5-1	Al	Al	6	24	4	0.069	95.88
EC5-2	Al	Al	6	24	4	0.111	93.37

4. Conclusion

The slaughterhouse wastewater treatment process by electrocoagulation system gave positive feedback in terms of colour removal.

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VERMICOMPOSTING OF CHICKEN WASTE

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1. Introduction

Nowadays, poultry industries have overgrown around the world. The problems that arise from poultry industries due to the non-appropriate disposal of chicken wastes are environmental pollution, groundwater contamination that creates odors, greenhouse gases emission into the atmosphere, and promoting breeding of flies and rodents. The conversion of the chicken dung and feathers to eco-friendly products such as organic fertilizer or any high value-added product leads to a sustainable and better waste management system. Therefore, this study aimed to determine the effect of different ratios of chicken dung and chicken feathers as a medium in vermicomposting through the vermicompost biodegradability.

2. Methodology

There were five treatments prepared for the study, all of which used the 6:3:1 ratio formula [1]; six ratios of mushroom medium residues, three ratios of chicken wastes, and one ratio of banana stem. The chicken waste included chicken dung and feathers. An observation was conducted for 63 days for the vermicomposting process.

3. Results & Discussion

Vermicompost biodegradability coefficient was used to measure the vermicompost quality [2]. The highest K_b was found when combining two ratios of chicken dung with one ratio of chicken feathers for the ingredients of chicken waste with 35.80% (day 42) and 51.59% (day 63). This combination enhanced the degradation process of vermicomposting compared to vermicompost of chicken feathers alone due to the high keratin content available in chicken feathers, which caused the slower degradation process.

4. Conclusion

Overall, combining two ratios of chicken dung with one ratio of the chicken feathers in chicken wastes offers a successful approach for efficient composting. Furthermore, this research is relevant to the National Solid Waste Management Policy through a good waste management practice.

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AN ENVIRONMENTALLY AND FRIENDLY POFA-SAWDUST CONCRETE PAVEMENT

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Keywords: Concrete, Palm oil fuel ash, Sawdust, Waste materials.

1. Introduction

This research used waste material such as Palm Oil Fuel Ash (POFA) and sawdust in concrete mixture. Jengka, located in Pahang, is the largest palm and rubber producer in Malaysia. The production of POFA is rising every year, and disposed of in landfills. Sawdust is a waste from timber production which is dumped or burnt in the open. This practice has dangerous effects on the environment causing air and land pollution.

2. Methodology

There are seven types of concrete mix proportions. The optimal mix design proportion that increases performance of POFA- Sawdust concrete was established.

M1: OPC + FA + CA + water
M2 : OPC+FA+CA+water+5% POFA
M3 : OPC+FA+CA+water+10% POFA
M4 : OPC+FA+ CA+water+15%POFA
M5:OPC+FA+CA+water+5%POFA+5% sawdust
M6:OPC+FA+CA+water+10%POFA+5% sawdust
M7:OPC+FA+CA+water+5%POFA+5% sawdust

3. Results & Discussion

As shown in Figure 1, it was found that mixture M5 gives good concrete strength when incorporated with sawdust, compared to other mixtures.
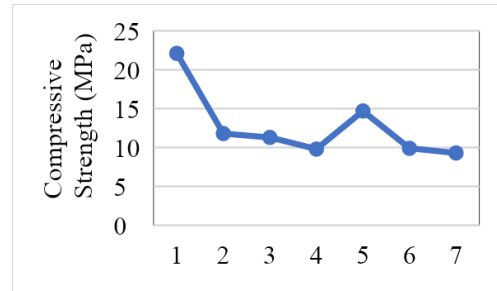
Figure 1. Compressive Strength at 28 days for all Concrete Mixture (M1-M7)

4. Conclusion

POFA and sawdust appear to be unique complimentary materials. Implementation of waste POFA and sawdust not only decreases environmental damage, but also saves the concrete materials.

Acknowledgments

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ZONING STUDIES AT CULTURAL HERITAGE SITES OF KOLAM TUJUH TAMBAK VILLAGE LANGGAM DISTRICT PELALAWAN

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1. Introduction

Based on the Regional Regulation of Pelalawan Regency 7 of 2019 concerning the 2019-2039 Regional Spatial Plan (RTRW) Cultural Heritage Sites Of Kolam Tujuh in Tambak Village, Langgam District is one of the cultural heritages in Pelalawan. Nevertheless, in the field, the condition of Cultural Heritage Sites Of Kolam Tujuh has not been identified properly and is in the middle of a community settlement and many houses have been built in the site area where it is feared that the settlement will continue to experience development that can damage and eliminate the identity of the Cultural Heritage Sites Of Kolam Tujuh.

2. Methodology

The initial stage of this research was to identify the characteristics of Cultural Heritage Sites Of Kolam Tujuh through qualitative descriptive data collection using a non probability sampling technique. Characteristics, potentials and problems in the area around the Cultural Heritage Site Of Kolam Tujuh were obtained through qualitative descriptive data collection. Meanwhile, zoning used descriptive analysis and gis.

3. Results & Discussion

The research conducted on the cultural heritage site area Cultural Heritage Site Of Kolam Tujuh in Tambak Village Langgam District Pelalawan Regency reveals that there are 3 zones, namely the core zone with an area of ± 4.4 ha, a development zone with an area of ± 8.4 ha, and a supporting zone with an area of ± 35 ha.

4. Conclusion

Zoning activities can become a reference for cultural heritage management, especially to minimize mistakes in the future. Based on the problem, the efforts made to protect the site and area is to zone the Cultural Heritage Sites Of Kolam Tujuh.

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HERBAL COUGH REDUCING PADS FROM HYDROGEL COATED NATURAL RUBBER

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Keywords: Cough, Hydrogel, Herbal, Natural rubber, Starch.

1. Introduction

Coughing is an action that clears the throat and breathing passage of foreign particles, microbes, irritants, fluids, and mucus through a rapid expulsion of air from the lungs. Medicine used to treat the cough is usually in tablets and fluid forms. Herbal pads are a choice to treat coughs for avoiding the orally intake problems. Natural rubber is a renewable green material with excellent adhesive properties. Hydrogel is a modified material that is able to intake a large amount of fluids, forming through graft copolymeriza-tion of starch. Herbal pads for cough reduction were formed from local herbs, namely charcoal, hydrogel, and natural rubber, and were treated for cough reduction.

2. Methodology

2.1 Formulation and medication

Three local herbs charcoal, tobacco, betle and coconut shell were powdered and mixed in exact weight ratios. Starch based hydrogel and ingredients (60%) were blended with former recipes. Natural rubber's films were cast in exact sized blocks and were further layered to produce herbal pads. Two formulations with distinct ratios were created, tested for cough reduction and satisfaction of use.

Table 1. Pads recipes

Recipes	NR (phr)	Hydrogel (phr)	Herb (phr)
1	100	40	60
2	100	60	40
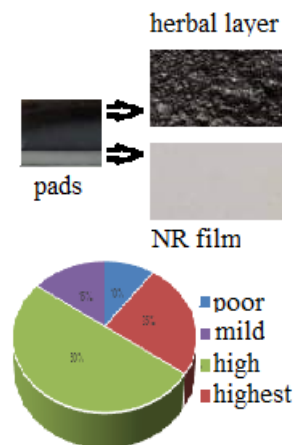
Figure 1. Pads composition (left) and percentage of recipe 2 satisfaction reports (right)

3. Results & Discussion

Cough reducing pads were entirely formulated by blending the herbal charcoal with hydrogel and layering on NR films as indicated in Figure 1 (left). Figure 1 (right) indicates the satisfaction test of recipe 2, and was found in high acceptance.

4. Conclusion

Both pads' features and medical properties were affected directly by herbs.

Acknowledgments

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DURABILITY OF RESIN TREATED KELEMPAYAN WOOD
(*Neolamarckia cadamba*)

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Keywords: Durability, *Neolamarckia cadamba*, Resin treatment, Termite test.

1. Introduction

The durability of resin treatment is determined by the insect attack through termite resistance test of *Macrotermes gilvus* (Macrotimitinae) on planted kelempayan wood (*Neolamarckia cadamba*). Previous research reported that resin treatment has improved termite durability of low-density wood [1] [2]. Hence, this study is expected to contribute to the updated discovery of planted timber species for the wood-based furniture industry.

2. Methodology

Investigation on termite test was conducted in accordance with the ASTM D3345-08 [3] on treated specimens of both low molecular weight urea formaldehyde (UF) and phenol formaldehyde (PF) resins. All the specimens were weighted to measure the mass loss.

3. Results & Discussion

Figure 1 indicates the surface typical rating of termite attack on test blocks was rated at number 10 (no infection). Figure 2 presents the percentage of weight loss termite decay of resin treated kelempayan wood in comparison to the untreated wood. The result indicates that resin treated kelempayan wood had great resistance to termite attacks.

Figure 1. Surface Infection by the Termites
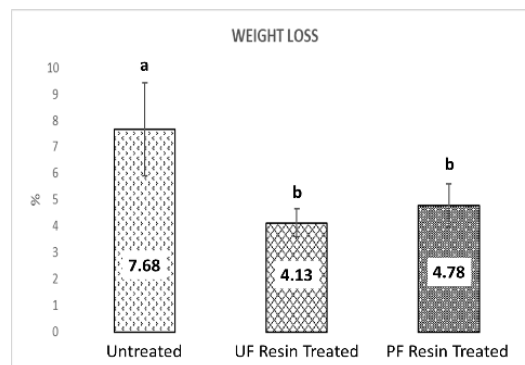
Figure 2. Weight Loss of Resin Treated Kelempayan Wood

4. Conclusion

Generally, it was expected that the resin treated kelempayan wood improved its resistance to termite attack.

Acknowledgments

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PARENT TEACHER ASSOCIATIONS MOBILE APPLICATION (PTA-MA)

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Keywords: Lean development, Lean startup methodology, Mobile application, Parent teacher association, PIBG.

1. Introduction

The emergence of the covid-19 pandemic has slowed down the government's efforts to achieve its education system transformation goals. Therefore, this project aimed to develop a special mobile application called PTA-MA to help the Parent Teacher Association (PTA) play a greater role in contributing to the success of educational transformation and also to further enhance communication among PTA members [1].

2. Methodology

This study used an online survey to obtain the views of PTA members on the use of PTA-MA. The development of PTA-MA adopted the Lean startup method, because this method requires a Minimum Viable Product (MVP) concept to startup mobile application development, and to quickly build and launch the application at a lower cost [2][3] (Figure 1).

Figure 1. MVP concept for PTAMA development

3. Results & Discussion

The results of the study found that most PTA members strongly agreed to and welcomed the use of application (Figure 2). The five basic modules of PTA-MA designed for pilot implementation are *Parent, Teacher, Activity, Communication,* and *Report*.
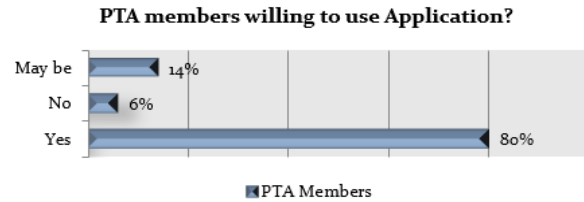
Figure 2. PTA members willing to use application

4. Conclusion

The implementation of PTA-MA is able to provide a systematic and harmonious approach to communicate and collaborate among PTA members. It is strongly recommended to launch PTA-MA on a larger scale with the support of the Ministry of Education. Further enhancement of the functions and options of the platform technologies is highly encouraged.

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ZESA: A ZERO-ENERGY FOR SOILLESS AGRICULTURE

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1. Introduction

The hydroponic and fertigation planting processes have managed to overcome the problems of conventional techniques such as acquiring large spaces, and high water and pesticide consumption [1]. However, both techniques are lacking in terms of waste energy consumption management and poor nutrients supply [2]. Therefore, ZESA – a modification from a combination of hydroponic and fertigation plant growth systems is introduced. It uses a porous soilless growing medium of biomass and self-nutrients intake using a piping system, suitable for fast harvest plants such as spinach. This planting system can be placed under sheltered and small space areas as it requires minimal watering and nutrients supplies monitoring. In this study, the effect of different soilless mediums was investigated on the growth performance of red spinach.

2. Methodology

Chemical composition and moisture content of cocopeat, biochar, and chemical fertilizer were analyzed using chemical analysis. Three medium treatments were conducted using randomized design. Plant growth parameters; plant height, number of leaves and fresh weight were recorded. One-way ANOVA with repeated measures model was used to perform statistical analysis.

3. Results & Discussion

Table 1 shows minerals the composition and moisture content of the mediums and fertilizer.

Among the mediums, cocopeat has shown to be of higher mineral composition and had the highest moisture content. The different ratio of soilless media has greatly affected plant growth. The treatment of the 100% composition of cocopeat has shown to be the most efficient results (F = 2.111, p-value = 0.049). Statistical analysis using One-way ANOVA of all treatments shows p-value of <0.05, indicating that all the data are acceptable.

Table 1. Mineral Composition and Moisture Content

Medium/ fertilizer	Moisture content (%)	Mineral composition
Cocopeat	82	Ca, Al, K, Fe, Mg, Zn
Biochar	11	Fe, Mg, Ca, Al, K
Fertilizer	-	Ca, Fe, Mg, K, Na, Zn

4. Conclusion

The composition of 100% cocopeat shows to be the most efficient ratio to enhance plant performance in soilless medium growth of red spinach using the ZESA system.

Acknowledgments

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SOFTWARE SUSTAINABILITY ASSESSMENT TOOLKITS TOWARDS GREEN COMPUTING

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Keywords: Environment dimension, Green computing, Sustainable development, Sustainability assessment, Toolkits.

1. Introduction

Software sustainability assessment toolkits towards green computing (SSA-GC) assesses the development of software by achieving green computing where it focuses on the way software is created, used, maintained, and disposed of with minimal or no impacts on environmental and human health [1]. The proposed toolkit provides the guidelines and sustainability index to determine the level of achievement at the end of the assessment process. The sustainability index helps the stakeholders to recognize the overall achievement of software product and process sustainability towards green computing.

2. Methodology

SSA-GC consists of six (6) components of assessments which are the assessment criteria, evaluation target, assessment process, data gathering technique, synthesis technique, and yardstick [2][3]. Figure 1 shows the assessment methodology of SSA-GC.
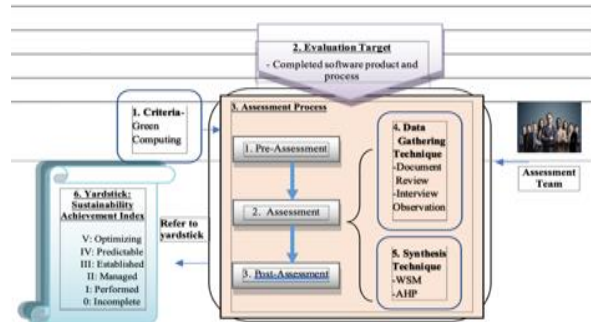
Figure 1. Assessment Methodology

3. Results & Discussion

The final results are supported by presenting the achievement level for continuous plan and action via the sustainability index. The expected results are as shown in Figure 2 below:
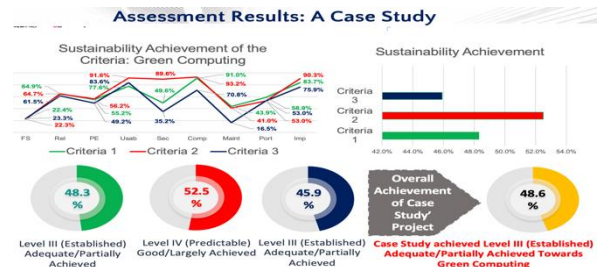
Figure 2. Assessment Results

4. Conclusion

SSA-GC can be potentially used in the real assessment of the software industry and support software development towards green sustainability.

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GREENATION: UPCYCLING OF PLASTIC MATERIALS INTO WOOD PLASTIC COMPOSITES (WPC)

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Keywords: Environmental friendly, Recycle plastic, Wood plastic composite, Wood waste.

1. Introduction

Plastic is known as a major contributor to municipal solid waste not only in Malaysia but also globally. It has been estimated that in 2025, the plastic waste generated will increase by 9-13%. Abundant wastes and scraps from plastic and wood-based industry can harm the environment, especially aquatic life, if no appropriate handling methods are taken. So, by combining plastic waste and sawdust as a raw material for manufacturing wood plastic composite (WPC) will solve the issue. The utilization of the plastic and wood waste reduces the disposal costs, and the manufacturing cost of WPC. WPC offers great performance such as biodegradable, lightweight and low-cost bio-based sustainable building materials.

2. Methodology

3. Results & Discussion

Table 1 shows the effect of recycled plastic materials on the properties of WPC. It was found that the use of recycled plastic (RP) improved the tensile modulus (39, 46%, 58% for RP1, RP2 and RP3 respectively) and flexural modulus (65%, 67%, 82% for RP1, RP2 and RP3 respectively).

Table 1. Mechanical and Physical Properties of WPC

	RP1	RP2	RP3	*(VP)
Tensile Strength (MPa)	11.18 (0.32)	11.37 (0.45)	12.54 (0.61)	15.65 (0.51)
Tensile Modulus (MPa)	3.03 (0.32)	3.19 (0.39)	3.45 (0.32)	2.18 (0.39)
Flexural Strength (MPa)	14.54 (0.34)	15.03 (0.51)	15.99 (0.51)	19.10 (0.67)
Flexural Modulus (GPa)	2.68 (0.41)	2.71 (0.51)	2.95 (0.48)	1.62 (0.88)
Impact Strength (kJm^2)	3.64 (0.35)	3.81 (0.33)	4.32 (0.36)	8.65 (0.41)
Thickness Swelling (%)	1.13 (0.34)	1.02 (0.32)	0.98 (0.47)	0.89 (0.51)
Water Absorption (%)	10.09 (0.21)	9.86 (0.35)	9.12 (0.61)	4.59 (0.51)

4. Conclusion

Generally the mechanical and physical properties of WPC were statistically comparable with and even somehow better than the virgin plastics. It is shown that recycled thermoplastics have great potential for WPCs manufacturing. It could prevent littering of used plastic and help cost reduction by substitution of virgin plastic.

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"EJAPANTAS": MOBILE AUGMENTED REALITY INTERVENTION FOR DYSLEXIA EARLY PRONUNCIATION SKILLS

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1. Introduction

EjaPantas is an augmented reality mobile learning app that aims to enhance pronunciation skills for two-syllable words in the Malay language. It aims in helping children with learning difficulties such as dyslexia to overcome their confusion towards certain alphabets, thus affecting the ability to read. A dyslexic individual has trouble associating visual symbols and letters with their corresponding sounds and is unable to arrange them in a proper sequence [1]. Past research recommended that in order to engage them in a more conducive learning environment, multisensory technique, phonics reading and multimedia elements should be integrated.

2. Methodology
2.1. Development and Testing

The learning app was designed and coded using the Unity 3D 2018 software. Adobe Photoshop and Canva were used in creating graphics in the user interface, and iMovie was utilised for editing video footage of alphabet pronunciation. The app consists of AR supported audio-visual learning modules using video clips of alphabet pronunciation, spelling module and quizzes. Functionality testing was conducted to ensure each module could operate correctly and smoothly. Every error was immediately corrected so that the app ran as intended.

3. Results & Discussion

From the Functionality testing, it was discovered that all modules such as the AR learning, videos, and quizzes were well integrated, while interaction in the app was simple, easy to understand and efficient. Figure 1 and 2 show samples of user interface.

Figure 1. EjaPantas main screen
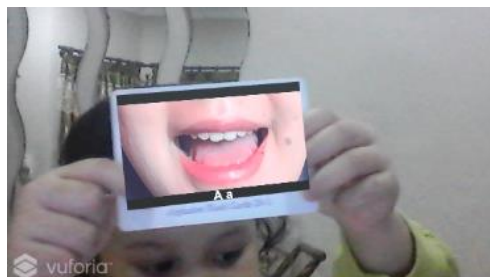
Figure 2. AR learning with video clips

4. Conclusion

The mobile augmented reality app provides an engaging learning environment for children with reading difficulties.

Reference

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THE PERFORMANCE IMPROVEMENT IN PROCESS FROZEN DURIAN PACKING. CASE STUDY: SAN FROZEN FRUIT CO.

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1. Introduction
This research project investigated the performance improvement in the process of packing frozen durians. This is a case study of San Frozen Fruit Co. The main purpose is to establish a more efficient frozen durian packing process. This study examined the actual operation by gathering information and interviewing staff involved in the frozen durian packaging process, then analyzed the problems using flow and fish-matching theory to analyze the operation and find a solution.

2. Methodology
A study tool for solving problems for efficiency in two major packaging machines.

2.1. Fish Bone Diagram
Analyze the cause of the problem by analyzing people, raw materials, methods and machines.

2.2 Flow Process Charts
Workflow analysis to examine each step that results in delays or malfunctions by conducting an operational analysis Movement, Waiting, Collection and Inspection.

3. Results & Discussion
The development of the packaging process was studied and analyzed to create additional equipment for the frozen durian packing process. The planning process is shown in Figure 1.
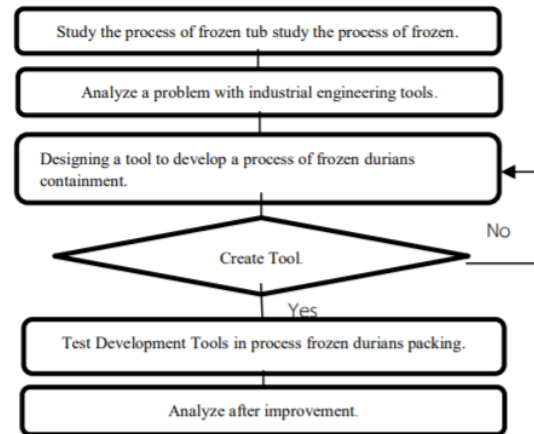
Figure 1. Operation Processes

4. Conclusion
Data analysis using industrial engineering principles can bring various problems that arise to develop efficiency in the packaging process of frozen durian through the study and planning of data from various analyses until the ability to create equipment to enhance the workflow to be faster than the process before the improvement as shown in Figure 2.

Figure 2. Flow process chart after improvement

Reference
[1]R. Sinthavalai :Quality Improvement, p. 73.

A FLEXIBLE EPOXIDIZED 30% POLY (METHYL METHACRYLATE)- GRAFTED NATURAL RUBBER POLYMER ELECTROLYTES FOR SUPERCAPACITOR

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1. Introduction

30% poly (methyl methacrylate) (MG30) was extensively studied by many researchers due to its good properties, high flexibility, low glass transition temperature and its ability to solvate inorganic salts to form a polymer-salt complex [1]. However, the value of ionic conductivity is insufficient for practical applications which requires up to $\sim 10^{-3}$ S.cm^{-1}. Furthermore, the MG30 based PE is unstable over a long term usage due to the presence of carbon-carbon double bond (C=C) in their polymer chain [2]. Epoxidation is the suitable approach to improve the stability of MG30. It will reduce the C=C in the structure of MG30 and increase the polar group with the formation of an epoxy group (C-O-C).

2. Methodology

Epoxidized MG30 (EMG30) was synthesized using performic epoxidation method and doped with various wt.% of LiCF$_3$SO$_3$ and EC to form gel polymer electrolytes (GPEs). The capacitance value of the supercapacitor based on EMG30 was inspected using cyclic voltammogram (CV).

3. Results & Discussion

Figure 1 shows the CV behaviour of the supercapacitor for the highest conducting sample. It demonstrates a voltammogram with a specific capacitance value of 0.470 F.g^{-1}.

The curve shows near to rectangular shape voltammogram even up to 100th cycles and there are no visible peaks due to redox reactions.
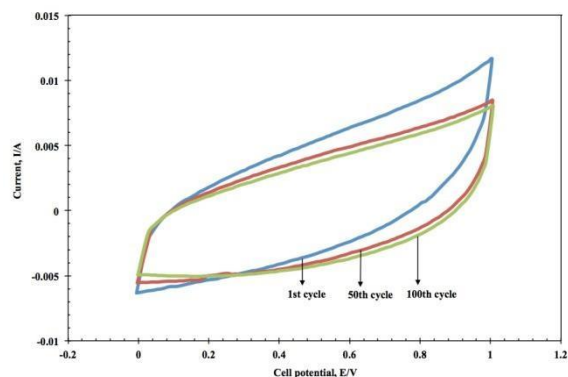
Figure 1. The CV behavior of supercapacitor for the highest conducting sample for first, 50th and 100th cycles.

4. Conclusion

The cell using EMG30 based GPE shows high performance as it still can maintain its electrochemical stability over 100 cycles of charge and discharge processes.

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Seringueira SEEDS: WASTE TO WEALTH FUEL FEEDSTOCK

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Keywords: Biodiesel, Egg shell, Methyl ester, Rubber seeds.

1. Introduction
The depletion of fossil fuels is a top issue in many developed countries currently [1]. An alternative way to recover the requisition of energy supply sources is by using renewable green fuel (biodiesel). This research discovers a new feedstock for biodiesel production from abundant biomass waste of rubber seeds with the aid of domestic waste as a catalyst. Rubber plantation being the second largest plantation in Malaysia, has approximately 540 million trees that produce 1 078 630 t of seeds annually. In a ratio of 7:3 for usable seeds to waste, it accounted for about 330 000 t of waste seeds which translates to 161 800 t of discarded rubber seed oil [2]. This scenario gives a brighter outlook of a significant amount of rubber seeds to be used as a promising feedstock for biodiesel, hence, decreasing the production cost.

2. Methodology
The reaction of transesterification was carried out in open system reflux technique equipped with a thermometer, magnetic stirrer, condenser, and 50 mL round bottom flask that were immersed in a water bath. The reaction was controlled at $65 \pm 3°C$ under the aid of constant magnetic stirring.

3. Results & Discussion
Rubber seeds oil was subjected to transesterification using egg shell supported sea sand as a base catalyst. Both waste materials were successfully converted to produce methyl ester with the highest conversion of 93.4 wt% in a 3-h-reaction period.

4. Conclusion
The use of this type of oil as a low-cost feedstock offers a cost-efficient and eco-friendly alternative to the existing feedstock for biodiesel production.

Acknowledgments

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WHITE SANDALWOOD EXTRACTION FOR PREPARATION OF SOLID PERFUME

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Keywords: Essential oil, Extraction, FTIR spectrum, Solid perfume, White sandalwood.

1. Introduction

Nowadays, the opportunity for consumers to receive hidden or toxic chemicals in various products has increased dramatically. This may have long term effects on consumers. Therefore, the use of products containing Thai herbs can be an alternative for consumers. The use of plants is encouraged to substitute the use of chemicals because they are less toxic. There are studies on plants used in various fields. For example, essential oils found in plants can be used as flavoring agents. White Sandalwood is well known to have fragrant flowers and pure essential oils with a soft scent. The extraction and production of White Sandalwood Solid Perfume was studied to develop safe and effective fragrances from White Sandalwood containing essential oils that is refreshing and able to conceal body odor.

2. Methodology

2.1. Materials and Methods

The White Sandalwood extracts were extracted using ethanol and methanol as a solvent. It was found that the extract solution was brown as shown in Figure 1.
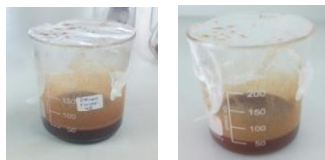
Figure 1. White Sandalwood extract

White Sandalwood solid perfume was made using different ratios of the extract oil (shown in Figure 2.)

Figure 2. White Sandalwood solid perfume

3. Results & Discussion

FTIR technique was used to study the function of White Sandalwood extracts, it was found that both FTIR spectrum appeared peak at the corresponding wave number ranges, namely 3305.99 cm-1 and 3290.56 cm-1, which are the stretching bands of O-H bond (stretch type). Wide spectrum characteristics and high intensity due to the inter-molecular hydrogen bonding and the results of the study of the dried perfume obtained by using essential oils.

4. Conclusion

The solid perfume used different ratios of extract oil. The result shows that formula 2 provided a fresh scent.

Acknowledgments

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NETWORK DEFENCE ENHANCEMENT VIA PENETRATION TESTING IN SANDBOX ENVIRONMENT

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Keywords: Network defence, Network security, Network vulnerability, Penetration testing, Virtual network.

1. Introduction

Network defence requires skills of the organizations in managing their network security. An effective method for testing security is penetration testing which requires highly skilled cyber security practitioners who are limited in numbers [1]. Unfortunately, employees have less exposure to protect their network and take it for granted until security issues arise. An alternative mechanism to sharpen skills in network defence is proposed in this paper. Performing the testing on a real network would be risky, alternative solution is via sandbox [2]. This allows them to explore the network attacks and defence by setting up their isolated penetration testing via software distribution. The potential problem arising can be tested and the result would be used to analyse the vulnerabilities in the network system.

2. Methodology

VMware Workstation was used for developing the virtual lab. Figure 1 shows the network design diagram. The network attack includes Synflood, Services and Routing attack. These attacks were performed by using Metasploit and Routersploit tools. Three types of firewalls distribution (PFSense, Endian, and IPFire) were used as defence. Wireshark packet analyser was run to observe the network behaviour. The logs of the host and network devices would then be sent to the host running ELK [3] for analysis.
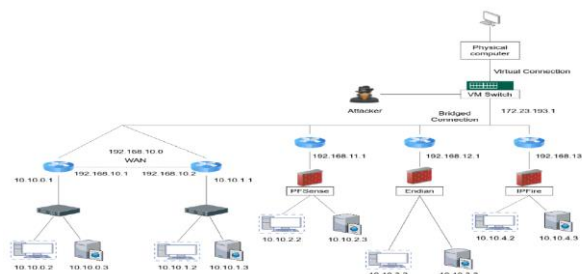
Figure 1. Network Virtual Environment Design

3. Results & Discussion

The network connectivity test was successful which proves functionality. The penetration testing showed the network has a good performance that prevents different types of network attacks.

4. Conclusion

The result confirms the practicality and usefulness of the proposed work. Besides, some other powerful penetration testing tools may be tested in future to perform and learn the other types of network attacks.

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KILIM AQUA MAPS 2.0 – MONITORING INSTRUMENTS FOR RIVER ACIDIFICATION AND CLIMATE CHANGE FOR SUNGAI KILIM, LANGKAWI

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1. Introduction

Sungai Kilim, Kedah is a tourist attraction area especially for those who seek ecotourism activities. Conservation of this area must be carried out effectively to sustain the livelihood of its residents. Consequently, we developed a model for the local authority to monitor the river ecosystem.

2. Methodology

The model uses different components as described in Figure 1.
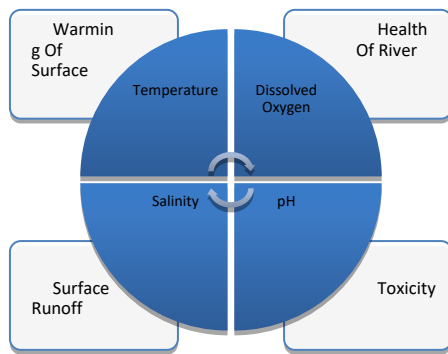
Figure 1. Component of the model

The development of the model is described based on the process diagram as described in Figure 2.
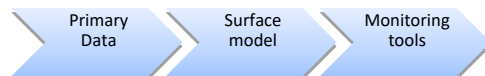
Figure 2. Steps for development of model

3. Results & Discussion

The model exhibits low Root Mean Squared Prediction Error (RMSE) from 0.071 to 0.153. Reduction of water quality could be due to excessive anthropogenic activities [1]. Furthermore, the mangrove areas host many species of birds and insects whose survival depends on this ecosystem [2].

4. Conclusion

The Kilim Aqua Maps 2.0 could help government and non-government agencies to construct strategic policies to monitor the river acidification and climate change processes for this area.

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KOK WATER MAPS 2.0 – MONITORING INSTRUMENTS FOR COASTAL ECOSYSTEM FOR PANTAI KOK, LANGKAWI

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Keywords: IDW, Langkawi, Pantai Kok.

1. Introduction

The first model was developed using the spline interpolation method. Here, we proposed a new model that uses the Inverse Distance Weighted (IDW) interpolation method. The study area is located at Pantai Kok, Langkawi.

2. Methodology

We proposed the method as described in Figure 1.
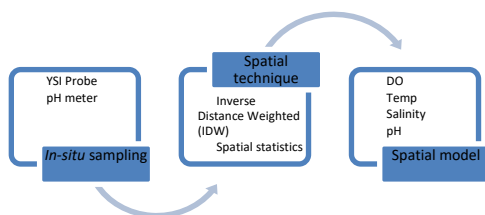
Figure 1. Method

3. Results & Discussion

The map indicates that salinity level shows increasing level from the East to West, temperature level shows decreasing trend from the East to West, while dissolved oxygen and pH shows no pattern and was normally distributed along the coastal water.

The tidal exchange had a significant impact on the variation of dissolved oxygen due to oxygen taken and released by plants and chemical processes such as aerobic respiration and chemical oxidation [1]. For pH, the rate of the dissolved carbon dioxide level could affect the normal pH reading and an extreme level of carbon dioxide level could contribute to the rise of ocean acidification [2]. For salinity, the pattern of salinity remained constant as there was no addition of freshwater in the study area [3]. The climate in Pulau Langkawi is tropical, the temperature is generally high at noon especially during dry seasons.

4. Conclusion

The Kok Water Maps 2.0 produced less error (RMSE): DO (0.364), pH (0.038), temperature (0.256) and salinity (0.491).

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ACADEMIC CONFERENCE, INVENTION, INNOVATION AND DESIGN (IID) MANAGEMENT SYSTEM

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Keywords: Academic conference, Free services, IID, Management system, Model.

1. Introduction
In recent years the number of Academic Conferences (AC) and Invention Innovation and Design (IID) competitions have increased in number. This trend emerged as institutions nationwide started to establish their own AC and IID competitions. However, to organize the AC and IID, organizers need an articulate and organized procedure. A medium is needed for the organizers to communicate with the participants. Previously, emails and telephone calls were used. However, these methods are not convenient for both the organizers and participants. The latest and more efficient way is by using a web page; an online system for the organizers and participants to communicate. Several systems have been introduced such as Easychair, EDAS etc. However, these systems are costly and have an unfamiliar interface. The authors aim to introduce a free and reliable system that can replace the existing paid systems. The system is called Academic Conference and Invention Innovation and Design Management System (ACIDMS). ACIDMS integrates Google Sites, Google Form, Google Docs, Google Sheet and an Ad-On Autocrat.

2. Methodology
2.1. Agile Model
ACIDMS was developed using the Agile Model because there was no need to customize the design for every specific function as they are offered as-is. The authors adopted the design elements stated in [1]. In contrast to websites that focus on contents, ACIDMS focuses on the flow of the process from registration to publication. The processes being automated are as listed below:

  i. Registration
  ii. Email Notification
  iii. Acceptance
  iv. Payment
  v. Judging for IID
  vi. Review for Conference
  vii. Winner Announcement for IID
  viii. Publication for Conference

Most of these processes are automated with custom notification to participants.

3. Results & Discussion
ACIDMS is proven to be a better alternative to the existing systems that are costly. ACIDMS is reliable, easy to maintain, fast development and free.

4. Conclusion
It is feasible to build an academic conference (or IID) Management System fast and free.

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MICROPROPAGATION OF MEDICINAL HERB, *Tacca integrifolia* Ker-Gawl. (WHITE BATFLOWER)

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1. Introduction

Tacca integrifolia Ker-Gawl (Family Dioscoreaceae) grows well under shade, with ample moisture and a good well-drained organic soil in Malaysian forests. This medicinal herb was traditionally used to lower blood pressure, treatment of piles, gastric ulcer, and enteritis [1]. The plant propagates from seeds, but has a poor germination capacity [2]. Therefore, the micropropagation by tissue culture technique is the best option for rapid and mass production of the plantlets.

2. Methodology

The seeds of *T. integrifolia* were obtained from Kuala Keniam, Pahang National Park. The sterilized seeds were sown onto a half-strength using Murashige and Skoog (MS) medium for germination in the incubator room. After 2 months, the seedlings were cut into pieces (explants), and sown onto MS medium supplemented with four different combinations of plant growth regulators (Kn+2.4-D, Kn+IAA, Kn+IBA, and Kn+NAA), then incubated at 25^0C, 16:8 hours photoperiods for 2 months. The diameter of callus and the number of shoot induction were calculated every week. Any morphological changes were also recorded during the study periods.

3. Results & Discussion

Formation of callus started after a week and proceeded throughout further incubation. As shown in Figure 1, the MS media supplemented with 1.0mg/L Kn+1.0mg/L IBA produced callus and shoots of normal healthy appearance without any morphological abnormalities, compared to the other treatments.
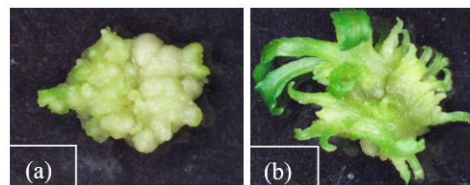
Figure 1. (a) Callus; and (b) Shoots induction of *T. integrifolia.*

4. Conclusion

The *in vitro* micropropagation of *T. integrifolia* ensures rapid multiplication of the plant materials and production of large numbers of plantlets in a short time.

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SLOPE REHABILITATION STABILITY ESTIMATION CHART

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Keywords: Factor of safety, Slope rehabilitation methods, Slope stability analysis.

1. Introduction

In the Malaysian practices, the standard design for slope rehabilitation methods were recommended by [1]. The established guideline from [2] significantly verifies the proposed method of slope rehabilitation. Over design proposed in slope rehabilitation method will introduce an expensive and irrelevant cost. While under design proposed triggering the insufficient stability safety factor. Hence, this innovation introduces an estimation chart of Factor of Safety (FoS) for slope stability rehabilitation methods proposed with various soil cohesion values.

2. Methodology

Analyses of three common slope rehabilitation methods from [1] were adopted in producing the correlation chart to estimate a satisfies FoS based on the soil types represented by soil cohesion value.

2.1. Method of Stability Analysis

The stability analysis to evaluate the FoS for all methods proposed used the Morgenstern-Price limit equilibrium method with a constant soil property. The estimation selection factor was limited to soil cohesion value as the soil shear strength factor.

3. Results & Discussion

Figure 1 shows an empirical correlation to estimate the FoS based on soil cohesion value and slope rehabilitation method.
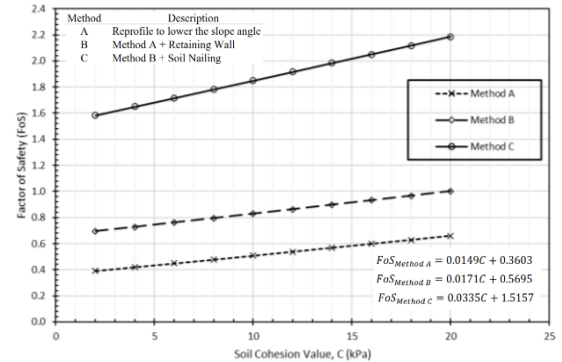
Figure 1. Correlation chart to choose the most effective slope rehabilitation method based on soil cohesion values for satisfied FoS.

$$FoS_{Method\ A} = 0.0149C + 0.3603$$
$$FoS_{Method\ B} = 0.0171C + 0.5695$$
$$FoS_{Method\ C} = 0.0335C + 1.5157$$

4. Conclusion

Innovation of estimation chart to identify the FoS for selected slope rehabilitation methods significantly verify for effective slope design selection.

Acknowledgments

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WINDSTORM RISK FOREWARNING (WiskWarn) APP

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Keywords: Mobile application, Risk, Warning, Windstorm.

1. Introduction

Windstorm is a natural disaster capable of causing damages to properties and losses of life. This extreme meteorological disaster is also known as a global phenomenon since it can occur at any place and time. Thus, WiskWarn app was developed to disseminate the risk (potential damages and affected area) when the windstorm occurred (real time). The app also displays the high-risk area of a windstorm. Even though an early warning system is not intended to prevent disaster but is still necessary because it could provide lead time for the public to save life and sometimes gives people enough time to safeguard their property [1].

2. Methodology

Grid, damages scale, local conditions multiplier map [2] and windstorm occurrence details are the acquired data for forewarning information in the app. The grid area of 1 km x 1 km, local conditions multiplier map and windstorm occurrence details are to produce a map which displays high-risk areas of windstorm. Meanwhile, early warning of the area which will be heavily affected when the windstorm occurred utilises grid area of 200 m x 200 m and damages scale.

3. Results & Discussion

Figures show the end product display in the WiskWind app.
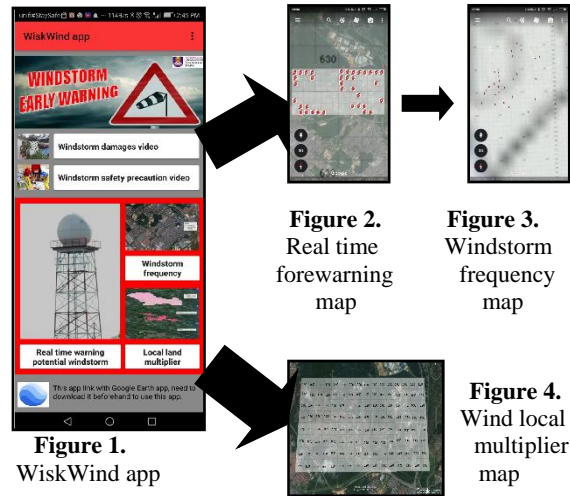
Figure 1. WiskWind app

Figure 2. Real time forewarning map

Figure 3. Windstorm frequency map

Figure 4. Wind local multiplier map

4. Conclusion

WiskWarn app is a tool for windstorm risk forewarning by displaying the specific high risk grid area, so that the public and local authorities could make early preparation in minimizing the impacts.

Acknowledgments

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SEABIO CREAM –SEAWEED AND PINEAPPLE BIOACTIVE COMPLEX IN SKINCARE

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Keywords: Healthy skin, Pineapple extract, Seaweed extract, Skin whitening, Skin hydration.

1. Introduction

Overexposure of human skin to ultraviolet radiation and pollution can increase the production of reactive oxygen species (ROS), causing premature skin aging, dryness, and hyperpigmentation [1]. Most skincare products contain harmful chemicals [2] and are inefficient due to limited skin penetration. Natural-based products are preferable as they are less toxic. Seaweed and pineapple extracts contain a myriad of beneficial bioactive compounds that can block ROS and improve skin conditions. Edible oils can increase transdermal delivery and improve the efficacy of topical cream application.

2. Methodology

A survey was first conducted to investigate the commercialization potential of natural-based skincare products among Malaysians. Formulation of SEABIO, a 100% natural-based skincare cream was developed and supplemented with Undaria pinnatifida, Ananas comosus, and Curcuma longa extracts.

3. Results & Discussion

About 83.6% of the respondents were in the age between 15-29 years old. Majority of the respondents were students (76.5%), had no income (76.3%), and had a moderately active lifestyle (63.9%).

About 89.3% of the respondents were using skincare products and 68.8% used the products daily. Majority of the respondents believed that moisturizing, curing acne, healing scar, minimizing pores, remedying skin dullness and blemishes are significant aspects of healthy skin. 93.1% of the respondents were concerned with the chemical contents of skincare products and believed in the safety and efficacy of natural-based products.

4. Conclusion

Based on the findings, natural-based skincare products have huge potentials in the billion-ringgit cosmetic market. The bioactive complex in SEABIO cream would be effective in preventing and reversing skin disorders.

Acknowledgments

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EFFECTIVENESS OF BAMBOO VINEGAR TOWARDS THE PESTS OF HARUMANIS (MA128), *Mangifera indica* L.

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Keywords: Bamboo vinegar, Harumanis, Insect pest, MA128, *Mangifera indica* L.

1. Introduction

Harumanis (MA128) *Mangifera indica* L. is one of the main signatures of Perlis due to its delightful taste, pleasant aroma, and expensive price. UiTM Perlis is one of the Harumanis producers that has more than 32 acres of Harumanis orchards worth about RM280,000 in 2018. However, in 2019 the production declined by 20 – 30%. Several factors may have contributed to such decline, but most researchers believe it is due to the pests that attacked during the flowering season. Therefore, we propose to investigate the effectiveness of bamboo vinegar in reducing the pests' attack on Harumanis as an alternative to the chemical insecticide.

2. Methodology

Bamboo vinegar was sprayed on Harumanis trees by using a knapsack sprayer once every 5 days before 10am during the flowering season. Unsprayed plots were used as a control check. The observations on the population abundance of insect pests per plot were done using sticky traps that were hung randomly in each plot before and after the spraying process. The sticky traps were collected after the spraying process [1]. Paired T-test was used to perform statistical analysis.

3. Results & Discussion

Figure 1 shows the mean ± SE of population abundance of insect pests in Harumanis. Results of paired T-test showed that there were significant differences in population of insect pests between before and after bamboo vinegar treatment (T=3.11, $P < 0.05$) due to its compounds that are essential in producing a potent insecticide [2].

Figure 1. Mean ± SE population abundance of insect pest

4. Conclusion

Bamboo vinegar shows effectiveness in repelling the pests of Harumanis and has potential as an organic insecticide.

Acknowledgments

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SMART MOTORIZED GRİLL

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1. Introduction
The product is a portable griller designed for barbecuing food using its grill net and automatic rotating rotisserie. Its special features include being portable, therefore easy to carry, smaller than any other existing grillers and require less space to store and install. It also has a multi-level grill height adjustment to control the amount of smoke produced by the barbecued food [1]. Finally, because it is lightweight, the creative briefcase design makes it portable and easy to fold into a bag.

2. Methodology
Figure 1 depicts the assembled drawing of the parts of the portable griller, with metal steel as the fabrication material. Steel was chosen because it makes the body durable, while also being light enough to meet the need for portability.
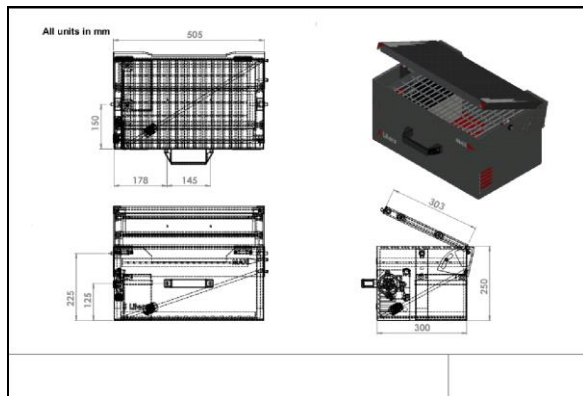
Figure 1. Assembled Drawing Parts

3. Results & Discussion
As indicated in Figure 2, modelling studies on barbecue nets were conducted using Solidworks software. According to the modelling results, the grill net can cook many items at once since it can withstand a maximum yield stress of 6.204 MPa. The portable charcoal barbecue equipment is a success as a result. Because of its portability, this equipment may be used to grill any type of food at any time and in any location.
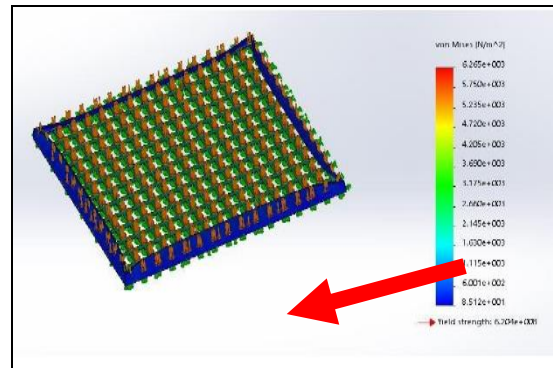
Figure 2. Simulation of The BBQ Nets

4. Conclusion
Overall, the project's goal has been met because it can help to reduce the amount of time and energy required to utilise the portable chicken griller.

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INTERNAL COMBUSTION ENGINE MODEL

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1. Introduction

It was noted that internal combustion engine (ICE) is a topic that is being taught in higher education institutions especially for programs associated with mechanical engineering and chemical engineering. However, it is very challenging for the students to understand the concept of ICE mechanism completely due to the limitations of their imagination. Therefore, an Internal Combustion Engine Model (ICEM) was proposed and designed to help the students to get better understanding on the ICE topic.

2. Methodology

The ICEM was designed as a portable device, having an acceptable weight, low cost and having the ability to show the complete process of ICE operation. It was made mostly from polyethylene and part of it from metal to fulfil its light-weight properties. Beside showing the movement of each stroke, the ICES also imitates the combustion stage where the spark is shown with the use of a light-emitting diode.

3. Results & Discussion

The ICES will be helpful to the students who have a hard time to imagine and understand the concept and mechanism of ICE. Students can visualize and operate the ICEM to get better understanding as supported by the idea from [1] where the students are able to memorize 90% of what has been done and seen as compared to what has been heard and read. In addition, it will elevate the learning atmosphere in the class as the students can use the hands-on simulator and have discussion

for each stroke of the ICE process. Figure 1 shows the ICEM fabricated.

Figure 1. ICEM

4. Conclusion

As a conclusion, ICEM are able to:
1. become the aid during the teaching and learning process on ICE topic
2. improve the learning environment
3. assist students in recognizing engine parts and understand the concept of internal combustion engine
4. promote science and technology.

Reference

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MALAYSIA'S NATURAL KAOLINITE AS GREEN ADSORBENT FOR REMOVAL OF DYE IN AQUEOUS SOLUTION

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Keywords: Adsorbent, Clay minerals, Dye, Kaolinite, Removal.

1. Introduction

Malaysia has an abundance of natural kaolinite clay minerals. This type of clay is low-cost, non-hazardous and has active functional groups [1]. However, its application as an adsorbent for water treatment industries has not yet been fully explored [2]. In this research, raw kaolinite was investigated for decolourisation of Methylene Blue (MB) dye in an aqueous solution.

2. Methodology

The kaolinite was characterized using techniques like SEM and BET surface area analysis. Batch method was used for the adsorption studies. The MB concentration was measured using UV- Visible spectrometer.

3. Results & Discussion

The raw kaolinite has a low specific surface area (Table 1). Yet, this clay demonstrated a 100% MB removal at a low-level concentration (Fig.1). Specific adsorption is postulated to be the major mechanism.

Table 1. Surface properties of kaolinite

Characteristics of kaolinite	Description
Morphology	Hexagonal plat
Specific surface area	9.11 m^2 g^{-1}
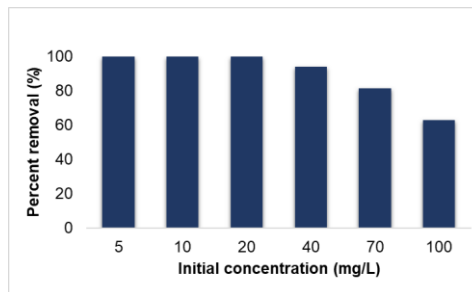
Figure 1. Performance efficiencies of kaolinite for MB removal (at pH 6, 25 °C)

4. Conclusion

Malaysia's natural kaolinite may serve as a new green adsorbent for water treatment. Future research shall focus on enhancing the surface characteristics of kaolinite through suitable modifications.

Acknowledgments

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LICHTENBERG FIGURE ON *Acacia*'S TABLETOP

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Keywords: *Acacia mangium*, Lichtenberg figure, Side table, Tabletop.

1. Introduction

Lichtenberg figures or fractal wood burning, is the art of burning lightning or tree like considers along with wood utilizing high voltage power [1]. Acacia mangium is a fast-growing species that usually turns into waste [2], and has been taken as raw material in this study. The objective of this research is to evaluate the public's interest towards Lichtenberg figure design on the tabletop of a side table using Acacia wood.

2. Methodology

The materials used to produce this side table were *Acacia* wood, steel and glass. Lichtenberg burning works by passing electricity at high voltage between two anodes while they are in contact with a piece of wood. After the side table has been produced (Figure 1), a set of questionnaires was distributed to 100 respondents. The characteristics evaluated by respondents include material, design, and marketing. The questionnaire data were collected and analyzed using Statistical Package for the Social Sciences (SPSS) software.

Figure 1. Side table with Lichtenberg figures on the tabletop

3. Results & Discussion

Table 1 shows the overall descriptive analysis. Results indicate that the respondents agreed with two variables; design and marketing. Design obtained the highest mean score (M =4.43, SD = 0.604), followed by marketing (M =4.23, SD =0.920). The lowest preference score was obtained for material with a score of (M =3.96, SD =0.728).

Table 1. Overall Descriptive Analysis

	Mean (M)	Standard Deviation (SD)
Material	3.96	0.728
Design	4.43	0.604
Marketing	4.23	0.920

4. Conclusion

In conclusion, based on the public's feedback, most of the respondents were interested in the design of the product. *Acacia* wood is suitable to produce side tables with Lichtenberg figures. This product has a potential for commercialization.

References

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MULTI-MODAL SENSOR FOR IN-CAR-ABANDONED CHILDREN DETECTION

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Keywords: Convolutional Neural Network (CNN), In-car-abandoned children, Multi-modal sensor.

1. Introduction

An automated children monitoring system has become desirable owing to the recent recorded incidence of in-car-abandoned children which is increasing and alarming [1]. However, confusion in discriminating the variability wavelengths of children's body thermal, sounds and movement has led to misclassification due to the inability to adapt the variations of complex object appearance. Therefore, the utilization of deep learning (DL) based classification methods is proposed due to its performances in terms of accuracy and speed of processing in image recognition [2].

2. Methodology

The significant wavelengths of children's body thermal image, sounds and movement were extracted using Correlation Feature Selection (CFS) algorithm. Next, the wavelengths datasets were constructed for DL classification and subsequently employed to formulate a DL model for classifying wavelengths via Convolutional Neural Network (CNN) classifier. Finally, the performance classification of the DL model was assessed and tested in terms of performance analysis via EfficientNet (EN) and MobileNet (MN).

3. Results & Discussion

Thermal sensor will capture thermal images of sleeping children and the application of DL is used to determine the shape of the children's image. The edge computing device will process sound within the car and the sound of crying children will be isolated from the background noise via DL. Any movement of the children in the car can be detected by ultrasonic sensors via a DL model.

4. Conclusion

A multi-modal sensor can detect children in many situations; panic, struggling or asleep. Therefore, an edge computing and compact device is more efficient than the car audio equipment. In addition, the DL model can ensure reliable detection of distress children.

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IMPLEMENTING HEUTAGOGY IN ENGLISH PRONUNCIATION FOR ONLINE DISTANCE LEARNING (ODL)

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Keywords: English learning, Heutagogy, Pronunciation, Speech-to-text, Text-to-speech.

1. Introduction

Online Distance Learning (ODL) has been implemented by higher educational institutions (HEI) amidst Covid-19 outbreak for English courses. However, a study found that ODL is not fully adapted by students due to lack of self-directed learning skills [1]. Furthermore, many Malaysian students have difficulties in pronouncing fricative consonants, voiced and voiceless "th", plosive consonants and vowel sounds in English [2]. In this paper, we aim to use speech-to-text and text-to-speech features in online heutagogy for English class.

2. Methodology
2.1. Preliminary Survey

In order to gauge students' perceptions towards self-determined learning during their English classes which was conducted using ODL in HEI during COVID-19 pandemic, a survey consisting of 31 items was distributed to 306 degree and 117 diploma students. This survey was conducted using Google Form and was distributed using social media platforms and emails.

3. Results & Discussion

From the survey, 39.4% were moderately happy and 49.8% thought that English lessons during ODL were moderately effective. The students faced problems such as poor self-determined learning skills (40.8%), internet speed (56.8%), internal/surrounding factors (50.2%), self-time management (58.7%), study materials (26.2%), communication (41.7%) and self-motivation (61.3%). Almost 90% of them agreed that heutagogy can be adapted and 88.2% had capabilities of adopting heutagogy. Both the rate of satisfaction and effectiveness of self-determined learning in pronunciation just retrieved 4.5%.

From this result, the students need adequate ODL resources and awareness about self-determined learning. Therefore, an application that combines text and speech in an online web for heutagogy can improve the effectiveness of English language learning in ODL.

4. Conclusion

Students are willing to use heutagogy to improve English pronunciation in ODL.

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PORTABLE DRESSING TABLE

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Keywords: Luggage bag, Movable, Portable dressing table.

1. Introduction

Portable dressing table is quite similar to a luggage bag except it has an additional function as a table. The objectives of the study were to design a dressing table with a portable concept and evaluate the customer feedback on the quality in terms of size, material and shape.

2. Methodology

A laminated plywood was the main material for the product which was used as the dresser compartment. Steel was used for the table legs, which were foldable to 90 degrees. The glass material was used as a mirror which is a complementary feature for the dressing table. A set of questionnaires was distributed to 150 respondents after a portable dressing table prototype was produced (Figure 1). Data were collected and analyzed using Statistical Package for the Social Sciences (SPSS)software.

Figure 1 Portable Dressing Table Prototype

3. Results & Discussion

Table 1 shows the results of the descriptive analysis. The material and design category obtained M=3.55, SD=0.72, which indicate that respondents agreed with the material used and design of the product. As for the marketing category; M=1.09, SD=0.24, indicating that most respondents answered "Yes" which shows that this product has market potential.

Table 1. Overall Descriptive Analysis

	Mean (M)	Standard Deviation (SD)
Material and design	3.55	0.72
Marketing	1.09	0.24

4. Conclusion

In conclusion, the respondents agreed that this portable dressing is space-saving and travel friendly.

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i-MediKids: CHILD HEALTH RECORD SYSTEM WITH IMMUNIZATION APPOINTMENT REMINDER

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Keywords: Appointment reminder, Child health record system, User experience testing, Vaccination reminder.

1. Introduction

i-MediKids is a web-based child health record system with appointment reminders. This system has the ability to record all the medical information about a child such as the height, weight, treatments and medical conditions since birth. It also has the ability to record the clinic visits and immunization details, reminders for next visits and immunization appointments. This system involves two main categories of users which are medical staff and parents.

2. Methodology

User Experience Test (UXT) was conducted to evaluate the system involving 35 users; 13 (37%) medical staff and 22 (63%) parents. During UXT, the users were given a chance to explore and evaluate the system. User Experience Questionnaire (UEQ) was utilized during the UXT. The items in UEQ were measured using the scale value with the range between -3 which indicates very bad and +3 which represents very good [1].

3. Results & Discussion

The result for every item shows that the scale value is above 0 where it represents a positive evaluation (Figure 1 and Table 1). The results from the UXT indicate that i-MediKids is an attractive system, has a good perspicuity, efficiency, dependability, stimulation and novelty.
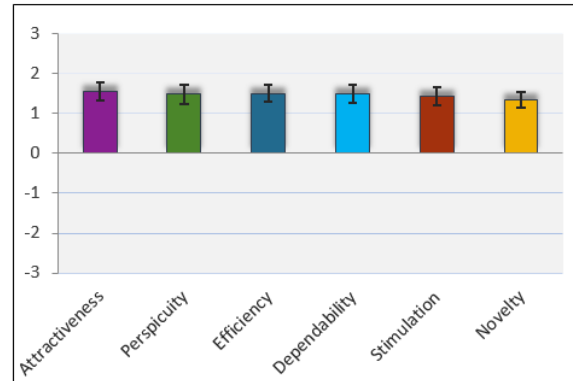
Figure 1. Mean Score for UEQ Scales

Table 1. The Value of Mean and Variance for UEQ Scales

UEQ Scales	Mean Score	Variance
Attractiveness	1.551	0.51
Perspicuity	1.486	0.51
Efficiency	1.507	0.43
Dependability	1.500	0.47
Stimulation	1.438	0.44
Novelty	1.340	0.39

4. Conclusion

In conclusion, most of the users had a good experience while using the i-MediKids system. Most of them also would like to recommend this application to be used in the near future as a system to record all the medical information about the children in clinics or hospitals.

Reference

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EGGSHELL − TAPIOCA COMPOSITE: AN ECO-FRIENDLY BIOPLASTIC

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Keywords: Bioplastic, Decomposition, Eggshell, Tapioca starch.

1. Introduction

Starch is a natural polymer that can produce bioplastics because its source is abundant, renewable, cheap, and easily degraded. It is becoming a promising alternative to synthetic petroleum raw materials in the production of plastics. Eggshell waste is an excellent choice as an environmentally friendly filler material in bioplastic composite reinforcement. This work aims to determine the thermal behavior of tapioca starch bioplastic (TSBP) in combination with eggshell (ES) as a viable alternative to currently available conventional plastics.

2. Methodology

To fabricate starch bioplastic, 12% of commercial tapioca starch (TS) was mixed with 74% distilled water. Then, 6% glycerol and 8% white vinegar were added. The mixture was heated at 80°C and stirred for 10 minutes. Finally, the mixture was poured onto a petri dish and allowed to dry for three days at room temperature. The same technique was used to fabricate the composite bioplastic, which contained an additional 4% ES [1].

3. Results & Discussion

Table 1 shows the three-step thermal decomposition of TSBP and ES:TSBP composite. The release of volatile chemicals happened at step II. At this point, there was a significant amount of material loss due to the amylose concentration of tapioca starch. This temperature range represents the primary thermal decomposition step.

Table 1. The decomposition of TSBP and ES:TSBP composite

Step	Sample	Trange (°C)	Description
I	TSBP	32 – 122	Evaporation of moisture content
	ES:TSBP	32 – 134	
II	TSBP	212 - 374	Releasing volatile chemicals (primary thermal decomposition)
	ES:TSBP	219 - 384	
III	TSBP	470 - 596	Burn the TS and volatile chemicals simultaneously
	ES:TSBP	674 - 790	Burn the ES and volatile chemicals simultaneously

4. Conclusion

ES:TSBP composite has a higher decomposition temperature than TSBP. In conclusion, the addition of ES powders increases the breakdown temperature of TSBP, indicating that the ES:TSBP composite has better thermal stability than TSBP.

Acknowledgments

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LIBRARY SYSTEM FOR MANGROVE SPECIES

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Keywords: Leaf water content, Machine learning, Mangrove, OBIA, Shortwave infra-red.

1. Introduction

Spatial and spectral based mangrove forest species data in Malaysia are scarcely available in the form of digital library systems or databases. The available mangrove species databases, compiled using different geospatial sources and statistics, need to be improved in terms of the available information as well as the database system.

2. Methodology

Object-Based Image Analysis (OBIA), a hybrid method that combines object-based classification techniques and machine learning (ML) algorithms was employed to delineate mangrove's species with in-situ data collection. A spatial and attribute based information/database system was developed using Geospatial technologies in providing updated, spatial and spectral based mangrove forest species.

3. Results & Discussion

Accurate species distributions will be analyzed and identified based on the leaf water content (LWC) from spectral analysis and classified short wave infrared (SWIR) together trees parameters including tree crown, diameter at breast height (DBH), leaf texture, and water quality parameters (salinity, sedimentation/ turbidity, temperature and pH levels). The system enhances spatial and scientific data regarding mangroves species.

4. Conclusion

The system is relevant in developing a sustainable mangrove forest management system. The integration of geospatial technology is promising in the improvement of mangrove individual species discrimination and mangrove growth monitoring towards the conservation of this green areas.

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DEVISING IMPACTFUL WEBSITE FOR RESEARCHERS

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Keywords: Aesthetic design, HCI, Usability design, Web development.

1. Introduction

Human-Computer Interaction (HCI) is a computer concept that involves interaction between humans and computers. To help researchers promote their Research Initiative Group (RIG) using a website during COVID-19 pandemic, usability and aesthetical elements must be applied. Both elements will increase the website exploration intensity and stimulate impactful emotion to the RIGs' potential partners [1][2].

2. Methodology
2.1. Preliminary Study

Preliminary study was conducted using Google Form that involved 37 respondents from public educational institutions. Science & Technology and Social Science affiliates took part in this survey; 64.9% and 35.1%, respectively. 22 questions related to the RIGs and website design were disseminated via social media platforms and email.

3. Results & Discussion

The survey found that 56.8% of the respondents owned less than 2 RIG memberships and 37.8% of them had above 10 years of experience as a researcher. Their research partners were government agencies (51.4%), individuals (59.5%), private agencies (18.9%) and NGOs (13.5%). Regarding their perceptions towards the website as a marketing platform, 64.9% agreed on the website importance, 59.5% agreed on attractive design, 40.5% agreed on color combination, 54.1% agreed on embedding multimedia content and 51.4% agreed on functional elements in the website.

Based on the result, the researchers were aware about the effectiveness of the website for their RIGs. They were concerned on how their RIG information such as achievement, profile and expertise must be conveyed in an interactive and informative way. Consequently, the RIGs can be publicly known to initiate more collaborations and to expand their experiences.

4. Conclusion

An impactful website can be developed with high usability and aesthetical design for the researchers.

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BIODEGRADABLE RICE-HUSK PLATE

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Keywords: Biodegradable, Impact strength, Polypropylene, Rice husk.

1. Introduction

Incorporating various types of fillers into polymer matrices is an intriguing way to create polymer composites with biodegradable features. Natural filler offers several advantages such as low density, non-toxic, low cost, biodegradability and non-abrasive. Rice husk (RH) is a substantial agricultural residue that is generated as a result of the rice milling process [1]. It is important to look into the prospect of turning RH, which is a waste product from rice milling, into plastic materials and manufacturing useful composites. Hence, this work investigated the effect of filler loading on the impact strength of polypropylene filled rice husk plate using four different filler loadings 0%, 15%, 30% and 45%, respectively.

2. Methodology

The plates were prepared using a plastic melt mixer and moulded using a cold compression system. The impact strength of PP/RH was studied by using GOTECH izod impact tester.

3. Results & Discussion

Figure 1 depicts the impact properties of PP/RH plates. The addition of RH filler resulted in a significant reduction in the impact strength. This is due to the filler's and matrix's poor interfacial adhesion, which caused poor stress distribution throughout the composite. Hence, when impacted, poor interfacial bonding created micro-spaces between the filler and the matrix polymer, resulting in numerous micro-cracks; these micro-fractures propagated cracks easily and reduced the impact strength of the PP/RH plates [2].
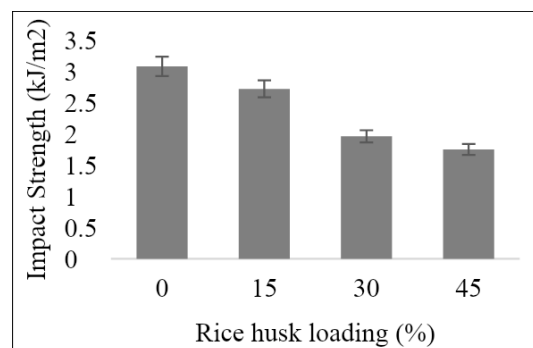
Figure 1. Impact strength of PP/RH plate as a function of filler loading.

4. Conclusion

Higher RH content has resulted in poor interfacial adhesion between the RH filler and the PP matrix.

Acknowledgments

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INDUCTING EFFICACIOUS ACADEMICS' PROFILE WEBSITE TENETS

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Keywords: Academics, Career development, Human computer interaction, Web design.

1. Introduction

COVID-19 outbreak has led to a surge in digital transformation for academics to pursue their career milestones. Digitization of curriculum vitae (CV) as a digital work is becoming mandatory and having a comprehensive website is the solution for their digital profile [1]. Therefore, it must be developed with ideal usability to provide efficient and sufficient flow of usage for the users [2]. Besides, aesthetic design in supporting user experience (UX) also needs to be concerned with creating a good feeling and must be easy to use for the users [3]. Finally, it helps academics to promote their profile and get as many potential benefits for career development.

2. Methodology

2.1. Preliminary Survey

In the early stage of identifying the tenets, a survey consisting of 31 questions was distributed to 37 academics. This survey was developed using Google Form and distributed using social media platforms and through emails.

3. Results & Discussion

From the survey, it was found that 45.9% of the respondents are senior staff (above 10 years) and almost half of them had an average frequency of updating their CV. 89.2% of them currently own one or more online career platforms. However, 56.8% of them did not have a personal web profile. Above 70% chose to share their working experience, publication, research and expertise information on the website. For the website features, some of them are concerned about dynamic searching and custom web.

This survey shows that online visibility among academics is important. Despite the influential current career platforms, a study on using usability and aesthetic design in website development needs to be conducted.

4. Conclusion

This study shows that tenets of effective profile websites for academics need to be defined for the academics' awareness.

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VIRTUAL RUN MANAGEMENT SYSTEM (VRMS)

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Keywords: Virtual run, Registration system.

1. Introduction

Virtual running works just the same as any other form of running, except it can be held at the runner's pace indoor or outdoor. According to [1], virtual is one that can be done or seen using a device without going somewhere or communicating to anybody. All the runner has to do is only enter the race and provide evidence of completed runs. The stakeholder for this project is LAMBAI Virtual Run, organized by Fakulti Sains Komputer Dan Matematik (FSKM) of Universiti Teknologi MARA (UiTM) Melaka. The current business process poses a few issues for the committee, as it is tedious for the users to use. The project aims to simplify the registration process.

2. Methodology

To ensure the project is well managed, 3 phases of the waterfall model were used as the methodology. The 3 required phases are analysis, design and implementation.

3. Results & Discussion

Figure 1 shows the list of tables created for the Virtual Run Management System. It consists of seven tables. All users information will be stored and saved in the correct tables. The short message system (SMS) notifications and the calculation feature for the run distance evidences are the special criteria of the system and are deemed as the novelty of the project which will simplify the virtual run registration process.
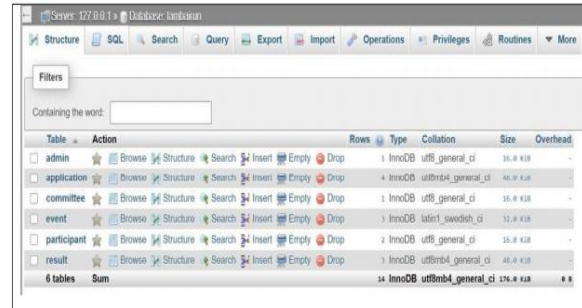
Figure 1. List of tables in VRMS

4. Conclusion

In conclusion, the virtual run management system is a very useful and suitable platform to substitute any manual registration process via google form, thus it has a big potential to be commercialized to other schools, institutions and organizations.

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REAL-TIME MONITORING OF RIVER WATER POLLUTION USING MULTIPLE SENSOR SYSTEM

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Keywords: Multiple sensor, WSNs, River water, Pollution, Monitoring.

1. Introduction

Multiple sensors are proposed to achieve a better analysis of data by comparing the value of detection in each sensor. The basic parameters proposed are temperature, pH, electrical conductivity and salinity. The research gain here is for knowledge and will contribute new techniques for water pollution monitoring systems by collecting data including a new design of sensors [1-2].

2. Methodology

Multiple sensor system was designed into four parameters for detection of river water pollutant index. The detection results of all sensors were analyzed and determined the polluted water content. Table 1 shows the complete expected measurement indicator and range of the results in the unit as well as the accuracy.

Table 1. Sensor design specification

Parameter	Range	Accuracy	Method
pH	0 to 14	± 0.1	Glass Electrode
Temperature	0 to 16 ^{o}C	± 0.5 ^{o}C	Thermistor
DO	0 to 20 mg/L	± 0.5 mg/L	Polarography
Electrical Conductivity	0 to 50	± 0.5	Conductivity Measurement

3. Results & Discussion

The results of this testing of temperature achieve reading in the sensing and comparison to the thermometer as shown in Figure 1 shows the temperature measurement by thermometer compared to a temperature sensor in the sensing system. The average deviation between the sensing temperatures to the manual thermometer is minimum 0.071^o C to maximum 1 ^{o} C.
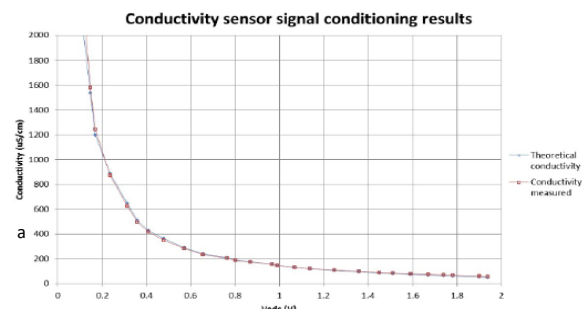
Figure 1. Water conductivity pollution graph

4. Conclusion

Four main indicators in sensing systems such as water pH, temperature, DO and electrical conductivity are measured to determine and give the decision on the quality of river water whether it is polluted or not.

Acknowledgments

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IDENTIFICATION OF FIRE HOTSPOT ON PEATLAND AREA IN RIAU PROVINCE, INDONESIA

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Keywords: Forest fire, Carbon dioxide, Identification, Concentration, Tropical region.

1. Introduction

The significant emergence and development of technology in wireless networks has changed and enhanced the natural environment control system compared to current methods that use satellite ground detection methods, such as wireless sensor networks (WSN) and long-range radio wide area network (LoRa WAN).

2. Methodology

Configuring sensor base stations in different areas to gather information from the WAN LoRA sensor network were developed in the peat area. The information collected by the sensor base stations was stored in an internal database and sent to the data center because the sensor base stations are located in remote rural areas located more than 100 km. Sensors can be used to detect a fire before it occurs and to immediately alert responsible agencies as a preventive measure.

3. Results & Discussion

The results of the temperature testing achieve reading in the sensing. The new method proposed in this system was designed to detect smoke, temperature, and particle changes that polluted the air in the Riau Province area. The LoRa WAN sensors were placed in a high-risk fire area to collect data. Figure 1 shows a series of results of the number of hot spots detected in Riau Province, Indonesia.

Figure 1. Series fire hot spot in Riau Province

4. Conclusion

A system for detection of land and forest fire using LoRa WAN technology is proposed. Results show the simulation and mathematical modelling based on calculation gives good response and the system can be applied as an alert system in the detection of forest fires.

Acknowledgments

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COMPARISON OF MD6, SHA3 (KECCAK) AND BLAKE2B HASH BASED ON TIME AND AVALANCHE

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Keywords: Hash functions, Security, Cryptography, Data size, Avalanche.

1. Introduction

Avalanche is one of the properties of cryptography algorithms used to test the strength of the algorithm [1]. The experiments to choose the best hash algorithm will be based on two parameters, time, or the avalanche effect. The data size plays a role to test the speed of any algorithm whether the hash algorithm has the ability to process the entered data faster. There are only a few studies that have focused on the effect of document size change on time criterion. Therefore, this study focuses on testing the most used and current hash function algorithms (MD6, KECCAK and BLAKE2b) by time of hash depending on different sizes of documents files, and avalanche effect.

2. Methodology

MD6, BLAKE2b, KECCAK algorithms were tested according to the time of hash depending on different sizes of documents, and avalanche effect, then a comparison was made between them. Two datasets, first dataset for time criterion was (T5-corpus), contains four file documents different sizes (64, 128, 256 and 512 KB); second dataset for avalanche was string "I will come to university" and then, one bit only was changed.

(a)
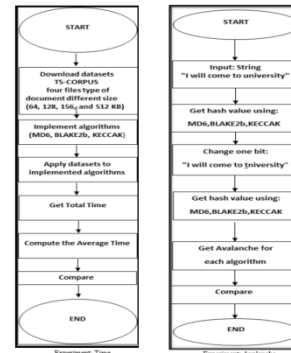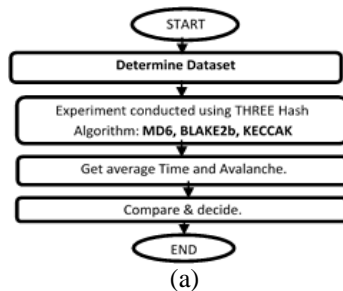
(b)

Figure 1:Flow chart of research (a) and (b)

3. Results & Discussion

Table 1: Time & Avalanche rate for experiment

Algorithm	TIME (sec)				Avalanche
	1st File	2nd File	3rd File	4th File	
MD6	0.003 25	0.00 685	0.01 513	0.0344 7	47%
BLAKE2b	0.004 43	0.00 889	0.01 797	0.0366 2	51%
KECCAK	0.008 63	0.01 733	0.03 482	0.0702 4	53%

4. Conclusion

The MD6 algorithm is the fastest and least secure. The KECCAK algorithm is slow, but highly secure. Thus, the time and avalanche criterion are found contradictory. So, it is best to use the KECCAK algorithm because the standard of time is not as important as safety. The security provided by the KECCAK algorithm, made it preferable to use.

Reference

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A NEW FLEXIBLE BIOPOLYMER NANOCOMPOSITE ETHANOL GAS SENSOR

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1. Introduction

In recent years flexible gas sensor technology has attracted a particular interest among researchers due to their potential applications in portable devices specifically in biosensors, air quality monitoring devices and smart packaging systems. Although the consumption of plastic in electronic industries contributes to a relatively small amount of waste, it should not be neglected. Hence, in this study, we have successfully produced a novel flexible gas sensor using Pd doped SnO_2 (Pd-SnO_2) nanorods and polyaniline. In order to acquire biodegradable characteristics, the nanocomposite was blended with biopolymer, polyhydroxybutyrate (P3HB).

2. Methodology

The method of preparation was divided into two parts: the production of Pd-SnO_2 nanorods via hydrothermal route and the synthesis of Pd-SnO_2/PANI/P3HB nanocomposite fibers electrospinning technique.

3. Results & Discussion
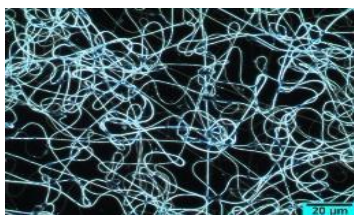
Figure 1. Electrospun nanocomposite fibres.
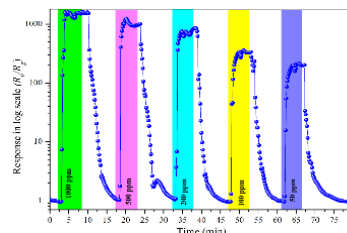
Figure 2. Real time-response curve

Table 2. Response at different ethanol concentration

[C_2H_5OH]	R_0/R_g	T_{res}(s)	T_{rec} (min)
1000	1.6×10^3	90	10.00
500	1.0×10^3	90	9 .00
200	6.2×10^2	50	8.33
100	3.4×10^2	40	8.00
50	2.0×10^2	30	7.00

4. Conclusion

This fibres sensor demonstrated excellent sensing properties at 80 °C as compared to Pd-SnO_2 nanorods sensor (450 °C). The sensor also showed good stability and sensing response even at lower concentration, 50 ppm.

Acknowledgments

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CORRBREAK: ANTICORROSIVE AGENT FROM TANNIN FOR ALLOY PROTECTION

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Keywords: Acid, Alloy, Tannin, Corrosion inhibitor, Computational chemistry.

1. Introduction

In this new era, green corrosion inhibitors have been widely applied in mitigating the degradation of metal-alloy. Our research revealed the use of local plant waste from mangrove bark which is useful for diversifying the employment of natural and organic chemicals for the particular end users such as metallurgy industry, coating, oil and gas, and chemicals processing industries.

2. Methodology

Waste of mangrove bark was grounded into powder and was subjected to solvent extraction before tannin powder could be obtained [1]. The inhibitor solution containing tannin was prepared at the concentration of 1-3g L^1 in 0.25-1.0M of two different acids. The corrosion inhibition assessment was carried out using immersion test, electrochemical test, surface electron microscopy (SEM) and modelling study.

3. Results & Discussion

It was found that the corrosion inhibition of alloy in the presence of 1-3g/L tannin in different acids gave significant increase in efficiency from 40 to 90% (Table 1). Quantum chemical calculations showed that the B ring (Figure 2) was the most probable site for the adsorption for corrosion inhibition.

Figure 2. Catechin structure (monomer of tannin)

4. Conclusion

Tannin from waste of mangrove bark could be a valuable residue in creating new sources for acidic corrosion inhibitor agents.

Acknowledgments

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Table 1. Corrosion inhibition efficiency of alloy in 3g L^{-1} in different types of acid

Tannin (3g L^{-1})	Inhibition Efficiency (*%IE*)
0.25 H_2SO_4	40
0.5 H_2SO_4	78
0.5 HCl	89
1.0 HCl	90

COMPLAINING STRATEGIES USED BY SURABAYAN STUDENTS AND MADURESE STUDENTS: A CROSS CULTURAL STUDIES

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Keywords: Complaining strategies, Cross-cultural studies.

1. Introduction

This research aims to investigate the complaining strategies used by two different cultures: Surabaya and Madurese. Complaining strategies include those with no explicit reapproach, expression of annoyance, accusations consisting of direct and indirect accusation, blaming consisting of modified blame and explicit condemnation, asking for responsibility, warning, expressing disappointment, threatening, criticizing, requesting or ordering and forgiving or accepting the offence [1]. This is a case study in which the data were taken from Surabaya and Madurese students in UIN Sunan Ampel Surabaya.

2. Methodology

In collecting the data, the researcher took a sample of 60 fifth semester English Literature students in UIN Sunan Ampel Surabaya; 30 students from Surabaya and 30 others from Madura. Then, the researcher used DCT which consists of six different situations in order to know the complaining strategy used by students in different contexts.

3. Results & Discussion

The results of this study show that Surabaya students used three complaining strategies; threatening was the highest with 60%, followed by modified blame with 23%, and asking for reason with 17%. Whereas, the Madurese students used at least five complaining strategies; forgiving (33%), modified blame (20%), criticizing and expressing disappointment (17%) and asking for responsibility (13%).
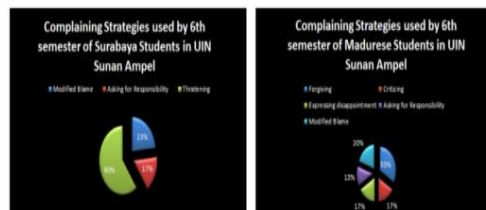
Figure 1. Comparison pie charts of complaining strategies used by Surabaya students & Madurese student

Based on the results above, this study relates to one of cross-cultural pragmatics concepts based on Wierzbicka (2003) that different societies and communities are able to influence people to speak differently.

4. Conclusion

By investigating the complaining strategies used in two different cultures it can be said that different communities will have different ways of complaining.

Acknowledgments

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REQUEST OF LIKE, COMMENT AND SUBSCRIBE ON YOUTUBE CHANNEL: COMPARISON OF INDONESIAN AND MALAYSIAN CULTURES

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Keywords: Indonesian culture, Malaysian culture, Speech act, Youtube.

1. Introduction

This research aimed to compare the requests utterances for like, comment and subscribe in the Indonesian and Malaysian cultures. As two different countries from the same language family, the researchers seek to answer these questions; are these phenomena similar in both languages and cultures or are there significant differences? For this reason, this research explored the differences, by comparing the time of uttering and also the form of the request utterances.

2. Methodology

In exploring the form of speech, this research relied on the speech act theory by Austin (1975) and Searle (1979) [1] [3]. In comparing the two cultures, this research was based on the concept of cross-cultural pragmatics [2]. The data in this study were the vloggers' utterances in requesting for likes, comments and subscriptions in a vlogs uploaded on Youtube. Data collection was conducted for two months (March-April) with the technique of listening and noting. The method used in this research was descriptive qualitative.

3. Results & Discussion

"jangan lupa like, comment, share, subscribe my channel"
The above is a request from Indonesian vloggers. It seems to have a commanding purpose. The vloggers wanted the viewers to do the things mentioned. The desire was conveyed directly and transparently without any implied meaning contained in it.

"jumpe lagi pada resep akan datang. Bye"
The above was from Malaysian vloggers, there is a slight difference with the Indonesian counterparts. The vloggers used the greeting "*jumpe lagi*" to express their requests.

4. Conclusion

In general, it can be concluded that there are differences and similarities in requesting likes, comments and subscriptions from vloggers of these two cultures. The similarity is that both have three delivery times and sincerity in speech. The difference is in uttering the form of speech the request is conveyed.

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COMPLAINING STRATEGIES USED BY GERMAN AND INDIAN: STUDY OF CROSS-CULTURAL PRAGMATICS

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1. Introduction

Complaining is defined as an expression that is used to convey disapproval. Complaining can cause conflicts, especially for the people with different cultures [1]. Complaining strategy is one of the aspects in pragmatics which play an important role to avoid conflict [2]. This study aims to compare the complaining strategies used by Germans and Indians in short movies. This present study focuses on the utterances used during the conversation.

2. Methodology

This study is a qualitative study. The data were taken from short movies which represent real-life conversation. There was no limited age and genre in collecting the data. The data were transcribed in order to perform a deep and detailed analysis. Short movies with the duration of approximately two hours were analyzed in this study.

3. Results & Discussion

The results show that there is a clear difference between complaining strategies used by Germans and Indians in the movies. It was mostly influenced by their cultures and beliefs. Germans mostly used negative politeness. They were more direct in making complaints and conveying what they felt. On the contrary, Indians were indirect in giving complaints. They were often involved in arguments. In order to express their complaints, they gave many explanations to make the interlocutors understand.

4. Conclusion

Based on the findings, it can be concluded that Germans are more direct than Indians in making complaints and Indians mostly use indirect strategy to respect the interlocutor's face.

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Extended abstract, Proceeding of iMIT SIC 2021

FUN LEARNING @ MCO3.0: SMALL BRICKS + BIG BRICKS

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Keywords: Bricks, Fun, Learning, MCO3.0, Preschool.

1. Introduction

Preschools are closed due to the implementation of the Movement Control Order (MCO) 3.0. Children need to be at home and follow online lessons. However, it is feared that this new norm will lower their motivation and focus [1]. Thus, the innovation using small and big bricks was introduced. With its fun, interesting, and easy features, the innovation is hoped to instigate the desire to learn among children at home accompanied by their family members [2].

2. Methodology
2.1. Materials and methods

One of the family members acted as an instructor. The instructor provided multi-coloured marker pens, whiteboards, whiteboard erasers, plastic containers and colourful small and big bricks. Later, the instructor wrote numbers, alphabets, or shapes on the whiteboard according to the learning theme of the day. Bricks of various colours, shapes and sizes were given to the children to be arranged on the writing sketched by the instructor on the whiteboard. Children were allowed to write with a marker pen on the whiteboard, before stacking the bricks on it. Activities such as counting and building structures of buildings, vehicles, or animals were also done to develop the concept of fun learning among the preschool children.

3. Results & Discussion

This innovation successfully integrates easy-to-use bricks with interesting lessons on recognizing letters, alphabets, and basic science. Preschool children will be more eager to learn at home throughout the MCO 3.0.

4. Conclusion

Fun learning can increase children's concentration. This innovation is expected to sharpen fine motor skills that involve the coordination of students' little fingers with their vision and brain. It is the best option in offering fun and effective teaching and learning techniques during MCO3.0.

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"EASY - PEASY" MATH GAME: LETS DIY @ MCO3.0

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Keywords: Count, D.I.Y., Games, Math, MCO3.0.

1. Introduction

Malaysia has implemented the Movement Control Order 3.0 to break the Covid-19 chain. Thus, learning is done online due to the closure of education institutions [1]. This situation decreases students' motivation and focus. Parents need to take creative steps to fill their children's time throughout the MCO period [2]. For that reason, this innovation highlights an interesting, simple, and inexpensive card game. It is suitable to be played by children as early as preschool age.

2. Methodology

2.1. Materials and methods

This game can be made on your own "do-it-yourself" (D.I.Y) with family members. It only requires simple materials like papers, manila cards, scissors, and a marker pen.

2.2. How to Play?

"EASY – PEASY" MATH GAME is a card game. Each round requires 2 - 4 players. The youngest family member can be the first player to start the game. Players build equations based on a given card's numbers and symbols. The winner is the fastest player who can build a mathematical equation. The winner needs to shout, "easy-peasy math"!!!

3. Results & Discussion

Three main concepts were successfully applied in this game, involving learning, playing and family bonding. This card game can be an alternative to online games on the screen. This innovative card game also sharpens children's minds for mathematics subjects. The game is also capable of improving children's communication skills, especially when they need to speak to express constructed mathematical equations.

4. Conclusion

This game is a significant innovation of a card gery much to all group members for the excellame with many benefits. It can be used to kill time during MCO. It is "EASY-PEASY MATH" …Just do-it-yourself.

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INNOVATION OF FLASHCARD LEARNING MEDIA BASED ON VIRTUAL REALITY IN ENLARGING LEXICAL RESOURCES OF DEAF AND HARD OF HEARING (DHH) CHILDREN

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1. Introduction

Barriers to communication and language skills are the primary difficulties which are experienced by children with hearing impairment. One of those difficulties is lack of lexical resources which affects the ability of deaf and hard-of-hearing (DHH) children in learning a new concept. Therefore, a proper strategy is needed to improve their vocabulary acquisition. The strategy in this case is by utilizing flashcards as a medium in teaching Indonesia Sign Language (SIBI) vocabulary. The flashcards facilitate DHH students to remember words in a new way of learning since they are supported by virtual reality (VR) technology. The goal of the present study was to design flashcard learning media that would enhance the vocabulary acquisition of DHH children.

2. Research Method

The study adopted the research and development method. Additionally, research data of this study were also collected through library research (content analysis).

3. Results & Discussion

Learning vocabulary can help DHH students express their thinking and understanding of basic competence. One of the aims of this innovation was to teach sign language using flashcards. The flashcards were designed based on the situations and the needs of DHH students. The goal was to help DHH students learn new vocabulary easily. In addition, the method also helped DHH students improve their communication and language skills.

4. Conclusion

The innovation of flashcard learning media based on virtual reality (VR) technology helps the DHH students to overcome the problem that they experience when learning new vocabulary. Besides, the innovation helps in realizing Sustainable Development Goals 4 of 2030 agenda.

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WEBINAR INVESTMENT LINK PROVIDERS (WILiP)

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Keywords: Investment, Webinar.

1. Introduction

According to Benjamin Graham, "an investment operation is one which, upon thorough analysis, promises safety of principal and an adequate return. Operations not meeting these requirements are speculative" [1]. To meet the requirements, investors play an important role in making sure that sufficient information is gathered, and thorough analysis is executed before they can conclude their investment decisions. In doing so, the information gathering environment has changed drastically after the global pandemic started in late 2019. Being able to participate in real-time discussions with experts around the world has made webinars one of the most popular platforms for information gathering nowadays [2].

2. Methodology

Nowadays investors are surrounded with an abundance of choices for their investment-based webinars, sometimes resulting in them missing those that were important. In helping to solve this issue, there should be a one-stop platform for investors to keep track of the upcoming investment-based webinars.

3. Results & Discussion

Webinar Investment Link Providers (WILiP) is a one-stop platform that provides links to investment-based webinars. The list of links is global and self-updated whenever new links are available. Users can customize their search by date, topic, or even by fee and webinars' organizer. Users will also be able to synchronize the webinars' events with their online personal planner and set a reminder to attend it.

4. Conclusion

In a situation where an abundance of information gathering choices are virtually available, WILiP is a solution to narrow down and shortlist what is most important to the investors in concluding their investment decisions.

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MONEY MOMENTUM

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1. Introduction

It is well known that the unexpected event of pandemic Covid-19 has affected the global economy. Strong endeavour of the world economies to improve the financial well-being of their citizens has contributed to the rising importance of financial literacy as it prepares individuals to take quality financial decisions to enhance their financial well-being [1]. Financial literacy is the foundation of an individual's relationship with money, and it is a lifelong journey of learning [2]. In any and every given situation, the ability to adapt to the current events with one's financial knowledge undoubtedly contributes a lot to one's financial survival.

2. Methodology

Even in the most desperate situation, rational individuals will still seek help to solve issues that they are confronting. However, when it comes to financial issues, some individuals still prefer to keep it private.

3. Results & Discussion

Money Momentum is a digital application that offers helpful features in guiding individuals with financial issues. The *Money Advisor* feature offers users hands-on and quick tips to solve simple issues. *Money Tracker* feature provides users with handy and simple tools to keep track of their disposable income and necessary expenses. *Money Investment* feature gives suggestions on investment alternatives that are relevant with the individual current financial status.

4. Conclusion

In situations where commitments are abundant while resources are limited, Money Momentum application is a handy, user friendly yet personal financial solution that allows someone without a financial background to solve their financial issues like a professional.

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inCAMPUS eWALLET (iCe)

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Keywords: Campus life, e-Wallet.

1. Introduction

E-wallet is a type of electronic card which is used for transactions made online through a computer or a smartphone. Its utility is the same as a credit or debit card. An E-wallet needs to be linked with the individual's bank account to make payments [1]. Student identity cards or simply student cards are issued by schools, universities, and other educational providers during the enrollment of their students. Usually, the card has some basic, but important information on the student's identity and it is used mainly as a student's proof of identity. In this era of pandemic, where the cash method of payment is discouraged and many have changed to opt for cashless, the function of student cards should then be enhanced to also become a medium of payment.

2. Methodology

Embedding an e-wallet function into student cards would be one of the ways to minimize the usage of cash on campus.

3. Results & Discussion

inCampus eWallet (iCe) is an idea of combining the basic function of student cards with the feature of an e-wallet. Payment through e-wallet is considered as one of the most prominent transaction methods at present because an electronic transaction using a digital wallet has the advantage of ease, flexibility, and protection [2].

4. Conclusion

iCe offers more than just an identity card to the students. By adding an e-wallet feature into the same student cards, it becomes more functional and valuable than just a plastic card.

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THE EFFECTIVENESS OF AN ACCOUNTING ON THE BLOCK (AOTB) BOARD GAMES TOWARD ACCOUNTING STUDENTS' PERFORMANCE DURING COVID-19 PANDEMIC

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Keywords: AOTB, Board games, Covid-19, Open distance learning, Teaching tools.

1. Introduction

The World Health Organization (WHO) has proclaimed Covid-19 as a pandemic that has posed a threat to humanity [1]. Education sector is most affected by the pandemic as schools and higher education institutions need to be closed and teaching and learning (T&L) to be conducted online via Open Distance Learning (ODL). The students were at first ill-prepared for ODL. Accounting lecturers were overwhelmed with the task of teaching accounting and non-accounting students within a short period of time whilst battling with issues such as internet connectivity, software compatibility, student's hardware problem and emotional and mentally related problems among students; and yet with the expectation that the students were able to immediately comprehend all the key concepts and excel in their studies.

2. Methodology

AOTB Board game was designed to make learning accounting more fun and engaging. However, ODL hindered some of its game-based-tool playability. For that reason, the board game was further innovated as a teaching tool, which provided a step-by-step process in preparing a financial statement that would offer a practical and meaningful application for students to grasp the core element of accounting, i.e. the double entry rule and application of basic accounting skills. The tool was tested on AC466 students to determine the level of its effectiveness.

3. Result & Discussion

According to the students, AOTB teaching tool is an exciting, dynamic, and effective method of learning preparation of financial statements. This finding is in line with the findings of previous study [2].

4. Conclusion

This innovative tool/game helps students to get a better understanding of the process involved in the preparation of financial statements and improve their performance in the accounting subject.

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A PERMATIWB MODEL IN EDUCATIONAL INSTITUTIONS

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1. Introduction

Malaysia requires people with world-class minds who are creative and innovative thinkers in order to be an innovative country by the year 2050 [1]. Unfortunately, Malaysia is still lagging in innovation and creativity. Malaysia has a long journey to achieve creative, dynamic, and innovative human capital. To support Malaysia to be an innovative country, the government's main agenda is to develop a world-class education system. Therefore, educators are urged to be creative and innovative.

2. Purpose

Educators exhibit a lack of innovative work behavior (IWB) because they are unfamiliar with technology-based teaching aids, underutilized teaching resources, and less student-centered learning [2]. The root cause of educators' lack of innovativeness could be that the teaching profession is extremely stressful and that they are suffering from depression, which affects their physical and mental health. Thus, resulting in poor performance such as not using successful teaching techniques which then leads to poor student outcomes. As a result, the PERMATIWB model was developed to gain a deeper knowledge of innovative work behavior by focusing on the educators' well-being.

3. Discussion
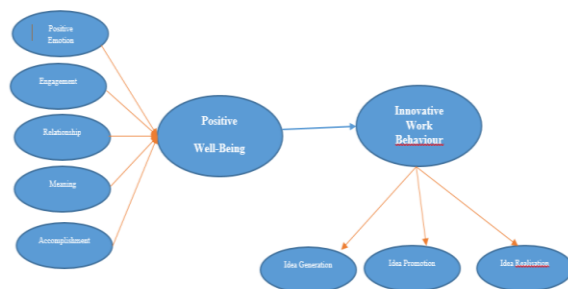
Figure 1. PERMATIWB Model

Positive Emotion (P), Engagement (E), Relationship (R), Meaning (M), and Accomplishment (A) [3] are used in PERMATIWB to investigate well-being in multidimensional perspectives, ensuring that educators are capable of creative and innovative teaching (IWB)

4. Conclusion

PERMATIWB will be useful for educational institutions to produce creative and innovative educators.

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EMPLOYERS' PERSPECTIVES ANALYSIS ON GRADUATES' EMPLOYABILITY SKILLS USING ASSOCIATION ANALYSIS

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Keywords: Association analysis, Employers perspectives, Graduates employability skills.

1. Introduction

Graduates' employability skills are key skillS that guarantee graduates employment [1]. The uncertainty of employers' perspectives on graduates' employability skills has become the main influence on graduate employment. This study aims to investigate the graduates' employability skills needed based on employers' perspectives.

2. Methodology

The data were graduate job advertisements collected via the online job portal JobStreet.com starting from 7 January to 6 April 2020. There were 11 job specializations, 4 job requirements and 10 skill requirements involved in this study as the employers' perspectives towards graduate employment requirements. Chi-Square test of independence and correspondence analysis were the association analyses used in this study and analysis by R version 4.0.2.

3. Results & Discussion

Table 1 shows the results of Chi-Square analysis for the job specialization and all job requirements. Minimum academic qualification and job language requirement had a significant association with job specializations. Figure 1 presents the asymmetric biplot between job specialization and graduate employability skills. There is an association between the job specializations and employers' perspectives on graduate employability skills.

Table 1. Chi-Square Test of Independence Result

Job Requirement	χ^2	df	p-value
Minimum Academic Qualification	43.61	10	0.0000*
Language	46.59	20	0.0007*
Working Experience	10.35	10	0.3952
Employ Fresh Graduate	14.72	10	0.1426
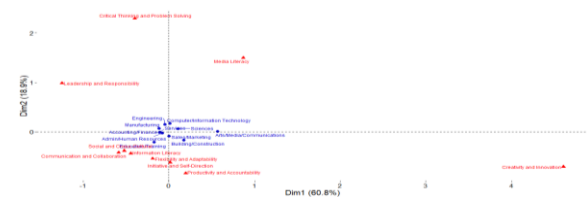
Figure 1. Asymmetric Biplot

4. Conclusion

Minimum academic qualification, job language, communication and collaboration skills, information literacy skill, flexibility and adaptability skills, initiative and self-direction skills and social and cross-cultural skills were the key employability skills demanded by employers.

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AOTB GAMES AS TEACHING TOOLS TO EASE WORKLOAD BURDEN DURING COVID-19

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1. Introduction

The World Health Organization (WHO) had declared Coronavirus disease (COVID-19) as a pandemic on 11 March 2020. During this pandemic, academicians need to conduct Open and Distance Learning (ODL). As a result, academicians faced several challenges that led to additional workload. Workload is defined as the burden or pressure experienced while performing the work [1]. An ideal workload ratio for an academician is 40% teaching, 40% research and 20% administrative duties [2]. Hence, a good teaching tool for ODL is indispensable to ensure unnecessary increase of workload. Accounting on the Block (AOTB) games were adapted as teaching tools in the accounting subject to reduce teaching workload [3].

2. Methodology

Before Covid-19, lecturers depended on textbooks, powerpoint slides and whiteboards. These methods of teaching can be viewed as being inflexible with lack of attraction and engagement in the learning process. Due to Covid-19, online classroom experience should be redefined and innovative ideas that make teaching and learning accounting more effective is mandatory. The learning process started with AOTB Card Games which cover 4 chapters of introductory accounting (Introduction, Accounts classification, Accounting Equation & Double Entry). Next, AOTB Board Game was used to cover another 4 chapters (Non-current Asset, Balancing off the accounts, Financial Statements and Adjustments).

3. Results & Discussion

AOTB provides the students with an opportunity to improve their performance and enhance their learning outcome.

4. Conclusion

AOTB is the best solution as a teaching tool to ease the workload burden.

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THE IMPACT OF USING AOTB BASIC CARD GAMES AS TEACHING TOOLS ON STUDENT'S SATISFACTION DURING COVID-19

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Keywords: AOTB basic card games, Student's satisfaction, Teaching tools.

1. Introduction

The world is currently fighting COVID-19 pandemic. This pandemic is highly contiguous, thus, social distancing is mandatory [2]. This has led educational institutions to adapt to Open Distance Learning (ODL) as a teaching and learning (T&L) approach. Several challenges were faced by the students while trying to familiarize themselves with the changes. Student's satisfaction is among the crucial issues to be addressed and many other factors that impact the T&L outcome. According to previous studies, using game-based tools improves students' views of learning, exam performance, and the learning process [1]. The aim of this study is to determine the impact of Accounting on the Block (AOTB)'s Basic Card Games as a teaching tool on student's satisfaction in learning accounting.

2. Methodology

This game is colour coded to indicate the double-entry rule in explaining the accounting equation of "*Asset = Equity + Liability*". The yellow colour represents "debit" and pink colour is for "credit". The tool provides a visual of the step-by-step process and effects of accounting equations that can enhance understanding. It was developed in accordance with the syllabus of introductory accounting course for SPM, diploma level and any students undertaking introductory accounting course. It was implemented to a newly revised syllabus ACC466 for topic 5, Preparation of Financial Statements (SOPL and SOFP) with adjustments.

3. Result & Discussion

This teaching tool is able to encourage students to actively participate in the classroom, provides a better understanding of accounting concepts, and promotes a stimulating learning experience.

4. Conclusion

It can be applied to teach introductory accounting topics to accounting students, as well as non-accounting students and students at the secondary schools.

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COLLAPSIBLE GARDEN POTBAG

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1. Introduction

The usual polybag in the market is made up of polythene [1], an alternative to plastic pot. It takes 1000 years for polyethylene bags to degrade and they should be thrown away after use. Taking consideration of this issue, the aim of this study is to innovate a durable eco-friendly product for green thumb users when transplanting their plants. The Collapsible Garden Potbag is made from silicone, hence it can remain in service for a long time and can be used repeatedly. This product also facilitates farmer's operation easily where it fixes soil shape by just pulling down each section.

2. Methodology

The project adapted the method by [2] which involved Analysis, Interest, Planning, Implement and Evaluation.

3. Results & Discussion

Figure 1.1 shows the look of Collapsible Garden Potbag before use. Figure 1.2 portrays the Potbag when contained with soil and plants. The Potbag's bottom has small holes that allow excessive water to flow during the watering process. Figure 1.3 displays the Potbag being pushed down for the transplanting process. It is clear that the Potbag firmly holds the soil taken onto its shape. Therefore, the transplanting process will be quick and easy.

Figure 1.1   **Figure 1.2**   **Figure 1.3**

4. Conclusion

Collapsible Garden Potbag promotes an alternative way to conserve our environment and it surely can be a part of a gardener's tool in the future. The culture of tearing off the polybag to remove the soil might not be practical anymore since the Collapsible Garden Potbag can be collapsed down or folded. Since it can be used repeatedly, this product comes with many economical and environmental benefits.

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LEARNING AND EMBRACING CULTURE AND LANGUAGE THROUGH FILM: A CROSS CULTURAL PRAGMATICS STUDY

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Keywords: Cross-cultural pragmatics, Politeness principle, Film, Technology.

1. Introduction
Technological development has a very significant impact on socio-cultural aspects and also language development. Nowadays, someone can easily learn other cultures and languages by utilizing the various platforms available, one of those platforms is film. Through films one can learn the culture along with the customs, language and norms that exist in a place or country. This study used two films from Thailand and India entitled "Bad Genius" and "Two State" respectively. The study aimed to examine the culture and language of these two countries using pragmatic aspects, namely the principle of politeness. This research is expected to increase cross-cultural understanding and can be a means for embracing and learning culture and language.

2. Methodology
This research used descriptive qualitative research through synchronic linguistic approach. This research was conducted with the following steps; preparation, data collection, and data analysis.

3. Results & Discussion
Based on the results there are six maxims of politeness principles in the film Bad Genius (Thailand) which include: 9 maxims of approbation, 4 maxims of tact, 3 maxims of generosity, 2 modesty maxim, 4 maxims of agreement and 3 maxims of sympathy. There are five maxims of politeness in Two States (India), namely 12 tact maxims, 6 maxims of generosity, 7 maxims of approbation, 3 maxims of agreement, and 1 maxim of modesty. The films displayed the culture of both countries such as language, ways of dressing, ways of interacting, beliefs, lifestyle, customs and traditions or distinctive habits. This research proves that to learn language and culture, technology plays a very important role. Film is one of the most interesting platforms to introduce culture and language. Language and cultural differences are something unique and respecting and tolerating other cultures is important.

4. Conclusion
Films can be a very interesting platform to introduce language and culture. One can learn not only the culture but also the language presented in each film. Future research should examine more films from different countries in order to gain more insights of the different cultures.

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AGRO-ESSENTIAL 3-IN-1 PLANTING TOOLS

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1. Introduction

Farm tools are instruments used on farms to assist work, reduce labour, and improve effectiveness. However, taking too many farm tools into the field and keep changing them can lower the farm productivity. Therefore, this innovation is aimed to increase the efficiency of the tools' usage. This tool enables farmers to perform three farm works; making hole on silver shine by using the "Hole Maker", loosening up soil using the "Garden Fork" and removing weeds between and on the planting bed using the "Weeder".

2. Methodology

The idea was inspired by personal experiences in farm works, input from farmers and brainstorming sessions on how to improve work performance by using the right tools.

3. Results & Discussion

This 3-in-1 Planting Tool comes with three head attachments which are silver shine hole maker, garden fork and weeder that can be attached and detached to the 1.5meter rod. It also comes with two types of handlers that can be changed according to farmer's preferences.
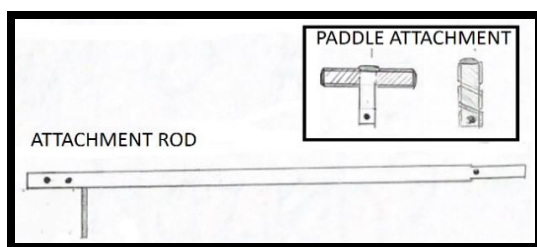
Figure 1 Attachment rod with two type handlers
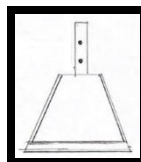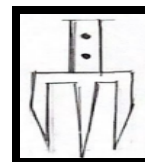
(a) Silver Hole Maker   (b) Garden Fork   (c) Weeder
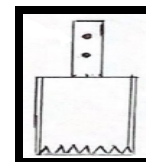
4. Conclusion

The 3-In-1 Planting Tool boosts the efficiency of work among farmers, thus, increasing productivity and profits while lowering the costs. Since the head tools can be used interchangeably, this product makes farm work faster and easier.

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JAWI E-LEARNING SYSTEM WITH EMAIL NOTIFICATION (e-JAWI)

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Keywords: Jawi E-learning, System, Email notification.

1. Introduction

The Jawi subject has been taught and has been made compulsory for all Islamic religious school students. Recognizing the Jawi letters is also important to recite the Al-Quran for all Muslims and it must be mastered from childhood [1]. The stakeholder for this project is Sekolah Agama Parit Bilal, one of the schools in Johor. The current educational process poses a few issues for the teachers, students and parents. The presently innovative e-JAWI project aims to improve the Jawi learning experience of the students.

2. Methodology

The Waterfall Model is used in this project. It has undergone 3 phases of the Waterfall Model which are the requirement analysis, design and implementation.

3. Results & Discussion

Figure 1 shows the learning materials created by the teachers for the e-JAWI product. Figure 2 shows the email notification of a students' results based on an assessment. These are the special features of the system and are deemed as a novelty to the project which will improve any Jawi learning experience.
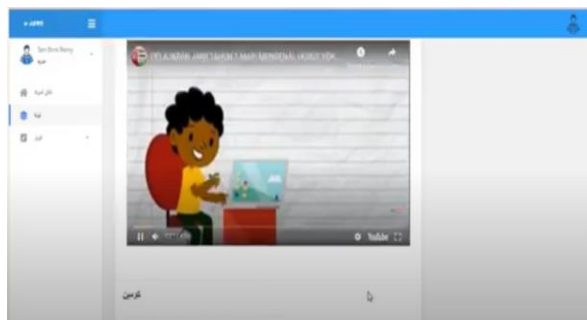
Figure 1. Materials for Jawi learning
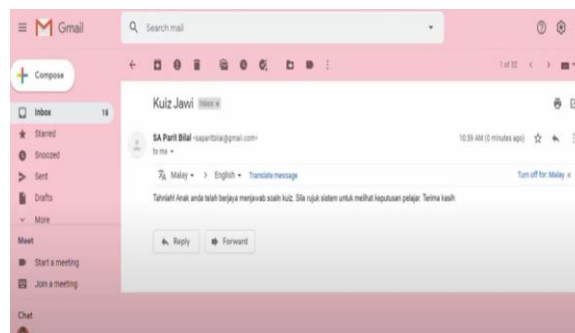
Figure 2. Email notification to parents

4. Conclusion

Jawi E-Learning System with Email Notification for Sekolah Agama Parit Bilal (e-JAWI) can be a significant contribution as well as a useful tool for the improvement of teachers', students', and parents' learning sessions, as well as having the potential to be commercialized to other religious schools.

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A COMPARISON OF STUDENTS' QUALITY OF LIFE AT BAN PHRU BUA SCHOOL, NAKHON SI THAMMARAT EDUCATIONAL AREA DISTRICT OFFICE 3, THAILAND

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1. Introduction

A child who has a good quality of life (QoL) will be a good person to the family, society and country. Good study quality is also important yet research on quality of school life is relatively rare[1]. This study aims to examine factors associated with QoL in Ban Phru Bua School, Nakhon Si thammarat Educational Area District Office 3.

2. Methodology

This study adopts a cross-sectional study where 54 students, aged 7 to 12 years old, answered a survey questionnaire (26 boys and 28 girls). 6 domains of QoL including relationships with friends and teachers were measured. Data were analyzed by using Cronbach's alpha, t-test and ANOVA.

3. Results & Discussion

64.81% students live with parents yet 25.93% were with divorced parents. 87.04% fathers and 77.78% mothers were farmers. About 46.30% had more than two kids and 92.59% had monthly household income of 5000 to 10000 baht. The Cronbach's alpha was 0.75, 0.71, 0.61, 0.68, 0.81 and 0.69, respectively, for physical, emotional and psychological, environmental, academic, relationship with friends and relationship with teachers domains. Gender, caregiver, marital status, number of relatives and household income had significant association with various domains of QoL but parents' occupation had no significant association with all QoL domains.

Table 2. Comparison of sociodemographic data of students with QoL.

factors	PHY	EPSY	ENV	ACA	RWF	RWT
Gender[1]	-	-	0.79*	-	-	1.75*
Caregiver[1]	1.16*	-2.41*	0.78*	0.35*	-	-
Marital Status of Parent[1]	1.65*	-2.57*	0.17*	2.35*	-	2.40*
Occupation of father[2]	-	-	-	-	-	-
Occupation of mother[2]	-	-	-	-	-	-
Number of Relatives[1]	-	3.72*	-0.63*	-	3.19*	-
Household Income[2]	0.49*	8.86*	-	3.26*	4.05*	-

1 = t-test, 2 = ANOVA , * Significant (P < 0.05), PHY = physical, EPSY = emotional and psychological, ENY = environmental, ACA = academic,
RWF = relationship with friends, RWT = relationship with teachers.

4. Conclusion

Parents' marital status is associated with almost all domains of the student's QoL[2]. For further research, in-depth research on this issue is required.

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THE ADMINISTRATIVE MODEL OF ETHICAL DEVELOPMENT FOR STUDENTS OF PRINCESS OF NARADHIWAS UNIVERSITY

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1. Introduction

This development should be appropriate for all ages, in accordance with the natural and full potential to meet the physical and mental needs, including intellective knowledge, skill, morality, ethics, good values and happiness of living. So, higher education's main role is to manage the ethics of students by interposing between students' activities or projects, thus producing ethical graduates following the qualification framework for Higher Education.

2. Methodology

2.1. Research procedure

2.1.1 Analyze data collection, documentary, theories, concepts, and related research.

2.1.2 Interview 20 key stakeholders.

2.1.3 Develop interview questions based on the data from 1.2.

2.1.4 Analyze focus group discussion

3. Results & Discussion

3.1. Development Phase

3.1.1 Data analysis.

3.1.2 Development of the administrative model.

3.1.3 Results of the administrative model of ethical development students for Princess of Naradhiwas University.

3.2. Evaluation Phase

3.2.1 The administrative model of ethics. Development consists of 3 components, namely Input, Process and Output.

3.2.2 The results of evaluation are following the four standards. It was found the administrative model of ethical development was improved, corrected, appropriated, useful and feasible.

Inputs are highly ethical leaders, personnel who understand local content and social environment, and cultural performance [1].

Processes include management structure, administrative strategy of ethical development, Innovated environment and organizational culture, community participation, Innovated ethical development for each course, Measurement and Evaluation of ethical results [2].

Outputs are students who have required qualification in self-ethics, ethical interaction with others, have good knowledge, and preserve unique culture and local wisdom [3].

4. Conclusion

The research found that the administrative model of ethical development for students of Princes of Naradhiwat University has 3 main components, namely Input, Process and Output.

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POLITICAL INTERVENTION SCANNER (PIS)

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Keywords: Political intervention.

1. Introduction

Political Intervention Scanner (PIS) was designed based on the comprehensive definition of political intervention that has been found and widely used in accounting journals. A comprehensive definition of a political intervention firm's scanner was specifically designed to help stakeholders, especially investors, to protect their interests from the expense of politician's objectives. PIS is also motivated by the revision of the Malaysian Code on Corporate Governance (MCCG 2021) that urged Malaysian firms to be neutral from politicians.

2. Methodology

Political Intervention Scanner (PIS) was constructed and developed based on various definitions from early studies from 2003 until 2020. PIS considers the revolution as a comprehensive definition of political intervention that considers the Malaysian political environment.

3. Results & Discussion

Public listed firms in Malaysia face huge drops in traded share price after the 13th general election due to the political intervention. Moreover, politicians in the boardroom can divert a firm's fundamental objectives to politician objectives. Furthermore, evidence has shown that politically intervention firms have low firm performance [1]; low level of corporate transparency; worst financial reporting quality [2]; and poor corporate governance [3].

4. Conclusion

A comprehensive definition of political intervention is fruitful to the researchers and stakeholders because it may give a significant effect to the firm's performance and financial reporting quality.

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THE LIVELY ACCOUNTING

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Keywords: Flashcards, Interactive videos, Accounting, Learning tool.

1. Introduction

Learning practical subjects such as accounting through interactive ways will make students understand better [1]. It enables students to engage in realistic tasks for collaboration and experience a deep approach to learning. Therefore, the aim of this study was to establish an interactive learning tool with the use of flashcards and interactive videos.

2. Methodology

This study used printed two-sided documents and digital flashcards which contained some explanation on accounting terms. Students would scan terms on the flashcards, which would automatically turn on the interactive video.

3. Results & Discussion

Table 1. Analysis of Preferred Learning Tools

Preferred learning tools	Frequency	Percent
Video	356	39
Digital Flashcards	296	32
WhatsApp/Telegram	268	29

Table 1 shows the majority of students preferred to learn through interactive videos due to the interactive, highly engaging, moving images, videos and sound [1].

Table 2. Analysis of Students Acceptance

Are you willing to accept the application of "The Lively Accounting" as part of learning tools?	
Yes	73.5%
No	5.1%
Uncertain	21.4%

In Table 2, the majority of students perceived that this product was able to enhance self-learning activities and assist them to digest the content in the videos [1].

4. Conclusion

In a nutshell, the combination of flashcards with interactive videos gives a new learning opportunity and different experience for students. Future research may consider combining other interactive learning approaches to further increase the learning outcomes.

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IMPACT OF MINAPOLITAN DEVELOPMENT PROGRAM IN KUANTAN SINGINGI, RIAU PROVINCE (CASE STUDY: WARSAWA VILLAGE)

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1. Introduction
The Minapolitan development program aimed to encourage the acceleration of the development of areas with fisheries activities as the main activity, improve the welfare and standard of living of rural communities (hinterland) who are depended not on only cultivation (on farm) but also processing and marketing (off farm) such as fisheries and other supporting services.

2. Methodology
This research aimed to analyze the impact of the minapolitan developing program towards the development of economic, social, environmental, and infrastructure. This research used qualitative and quantitative research methods. The data were compounded through observation techniques in the field, questionnaires (fish farmers) and interviews (government, public figures in that area).

3. Results & Discussion
The impacts of the minapolitan development are; (1) The enhancement of family income which affected economic value, accelerated economic change, created job references, increased people's saving, enhanced the market potency, adds more value to area productivity, encouraged the minapolitan production, and increased marketing possibility of fish farmers; (2) The increase in the number of counseling and technical advice about fishery affairs and social activities, increased the enthusiasm of society about fishery cultivation, improved nutrition and health issues as well as unions activities;

(3) The cleanliness of environment; (4) The improvement in the quality of irrigation and sanitation facilities.

4. Conclusion
The Minapolitan Development Program has a positive impact on the economy, social, environment, and infrastructure in Warsawa Village, Kuantan Singingi Regency.

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OPTIMIZING YOUR COST WITH COST-IT-RIGHT

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Keywords: Costing technique, Cost-It-Right (CIR), Job cost card, Product cost.

1. Introduction

Cost accounting information assists managers in recognizing the accurate cost of a product and setting up the reasonable selling price. Therefore, Cost-It-Right (CIR) is an approach that is used to assist entrepreneurs in determining product cost and selling price value. Additionally, students could also use CIR as a learning tool in a basic cost accounting subject.

2. Methodology

CIR system is an improvement from the previous innovation project where Microsoft Excel was used to create the calculation template. This system requires users to fill out relevant information in the columns provided. This project was outsourced to a programmer and information such as features of the system, product cost format and comprehensive example were provided for testing and other purposes.

3. Results & Discussion

Proper costing technique is needed to avoid errors in the product cost estimation, which may result in unplanned expenses, such as labour overruns, overtime, excessive material consumption, unanticipated direct costs [1] and affect the optimum profit earned by an organisation [2]. CIR system originated from job cost card features, which include costing terminology and comprehensive examples to assist its users to complete the process in order to attain the selling price per unit, total costs incurred and profit determination. Not only that, this system is useful as a learning tool for basic cost accounting subjects due to its features that help students to experience actual manufacturing operations.

4. Conclusion

CIR template has been initiated as an education and cost assessment tool on how to derive the precise cost, selling price and profit of a product. It provides a simple yet easy to use system that helps others in understanding basic costing techniques.

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EDUCATION 4.0: TECHNOLOGY READINESS INDEX AMONG ACADEMICIANS

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1. Introduction

Education 4.0 is an education system which uses disruptive and advanced technology in teaching and learning (T&L) activities. Are the academicians well-prepared with education 4.0 digital skills? Are the academicians ready to drive education 4.0 towards industrial revolution (IR) 4.0? To answer these questions, this study was conducted to measure the technology readiness index level among academicians and identify the challenges faced by the academicians.

2. Methodology

The study was conducted at a public university in Malaysia. It aimed to find out the level of information and communication technology (ICT) usage among academicians during T&L process. 251 respondents participated in a survey which was adapted from the technology readiness index (TRI) instrument by [1]. There were four dimensions produced from the TRI model namely optimism, innovativeness, insecurity and discomfort.

3. Results & Discussion

The findings show the level of awareness and readiness of academicians on the ICT usage during T&L process. There were 16 questions in the survey which derived from four dimensions aimed to investigate ICT usage among academicians during T&L at tertiary level. The findings show that academicians were optimistic about adopting technology in T&L process in order to be in line with education 4.0. The academicians also believed that they have innovative characteristics which are essential to make T&L activities efficient and dynamic.

4. Conclusion

From the study, we believe that this survey can also be used as a reference for developing better technology-based T&L tools to ensure that education 4.0 is successfully implemented in accordance with IR 4.0.

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ONLINE LEARNING ENLIGHTENING GUIDE (OLeEG)

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Keywords: Emotional well-being, Enlightening, Online learning, Students.

1. Introduction

Online Learning Enlightening Guide (OLeEG) was created to help online learners, particularly school students, organize their schedules and keep motivated during online learning at home. In keeping abreast with the use of technology and the situation of Covid-19 pandemic, OLeEG is presented in an attractive digital form. OLeEG consists of a routine timetable, tips on studying online and quotes on emotional wellbeing and motivation. It is hoped that this product will be able to assist the students during online learning and keep them motivated during the Movement Control Order period.

2. Methodology

An online survey was employed to acquire quantifiable data on consumer perceptions of the product including the product's usefulness, ease of use, perceived enjoyment, value, and emotional well-being among 30 participants, who were teachers and students from Sek. Men. Keb. Jengka Pusat 2, Bandar Jengka, Pahang. The questionnaire was adapted from [1] [2].

3. Results & Discussion

Table 1. Descriptive statistic of User Experience

No	Item	Mean	Std Deviation	Level
1	Usefulness	4.09	0.84	High
2	Ease of use	4.16	0.90	High
3	Enjoyment	4.03	0.86	High
4	Value	4.13	0.92	High
5	Emotional well-being	4.12	0.89	High

The majority of the respondents admitted that this product was easy to use (Mean = 4.16) and was also good value for money (Mean = 4.13).

4. Conclusion

This project intends to provide a solution for teachers and students to assist them in managing online learning schedules effectively that will lead to enhanced emotional well-being. However, future research should include more respondents to enable the findings to be generalized.

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e-RECYCLING AWARENESS KIT (e-RAK): INTERACTIVE ONLINE LEARNING AID FOR KIDS

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Keywords: Children, Online, Recycling awareness kit, Solid waste.

1. Introduction

In Malaysia, the recycling rate was recorded at a low level compared to other developed countries. Since 1 September 2015, the government has required the separation of solid waste in Pahang. Hence, to support the government regulation during the Covid-19 pandemic, a kids' learning aid named, "Online Recycling Awareness Kit" (e-RAK) was developed. It contains a teaching and learning video and an online game on solid waste separation. The objectives are to provide clear information on the process of separating solid waste and to nurture solid waste segregation practices among children.

2. Methodology

e-RAK was used as a main tool in the university's social responsibility program that involved a total of 115 participants from three schools in Bandar Tun Abdul Razak Jengka, namely Sek. Keb. Desa Jaya, Sek. Keb. Jengka Pusat 2, and PASTI As-Saadah Jengka 8. All participants received an e-RAK link containing a learning video and an online game. Upon completion of all activities, they were required to fill out their details and scores in a Google Form attached to the tool.

3. Results & Discussion

Table 1 presented the summary of respondents' scores.

Table 1. Descriptive statistic on Participants' Scores

Score	Frequency	Percentage
0-20	2	1.7%
21-40	26	22.6%
41-58	87	75.7%

The results show that the majority of respondents or 75.7% scored 41 to 58 marks, followed by 22.6% who scored 21 to 40 marks.

4. Conclusion

It is proven that this product has provided an understanding towards solid waste separation among children despite the situation of Covid-19 pandemic.

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SUBJECT'S WEEKLY-THINGS-TO-DO ITINERARY: CHARTING STUDENTS' OPEN AND DISTANCE LEARNING (ODL) ACTIVITIES

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Keywords: Learning motivation, Lesson plan, Online distance learning, Schedule task, Time management.

1. Introduction

Evidence shows that Online Distance Learning (ODL) impacts students' mental health [2] and results in various learning tasks [3]. As such, having various ODL activities from different subjects throughout the semester may cause students to lose focus, get confused and disorganized, hence could adversely affect their motivation to study [1].

2. Methodology

The subject's weekly-things-to-do itinerary contained details of ODL activities that were allocated 3 days prior to students' actual ODL classes. The itinerary explained what activities students need to embrace during the incoming lectures and tutorial sessions. If a topic covered a period of 3 weeks according to the syllabus, students would be notified of 3 itineraries in advance, hence allowing them for better mental and physical preparations.

3. Results & Discussion

Most of the students indicated that the itinerary helped in their learning as it improved their attention to the subject, made them more organized, reduced their learning anxiety and minimized overloading of tasks. The effectiveness of this approach could be observed from student's smooth participation in online class sessions and ability to submit their tasks within the stipulated time frame.

4. Conclusion

The subject's weekly-things-to-do itinerary helps in students' learning process because they would know in advance what new topics that they are about to learn and what learning activities they need to be involved in. This would certainly improve their way of organizing their study approach, thus reducing unnecessary stress. It is suggested that all subjects should adopt a similar approach for better ODL experience, both for the academics and their students.

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BEG METODE MATAku 20/20

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1. Introduction
One of the modification branches of Montessori Education and its application towards children's early education can be used for students with special needs in mastering the 4M principle [1, 2]. The strengths of Montessori Education are it encourages children to learn self-control, the use of vocabulary, and it uses interesting learning processes to enhance children's memory and metacognitive [3].

2. Methodology
Students with low-functioning ranges and learning problems have different levels of ability and mind, which will make it complicated for them to learn colours, shapes, pronounce words and word sequences, communicate, count, construct sentences, read, and extreme complications in fine motor movements. Students also have various behavioural and emotional problems. Plenty of Montessori tools can be used to help them focus and increase their interest in learning.

3. Results & Discussion
The methods, techniques, theories and philosophies that are applied can stimulate and encourage students not only to think critically and creatively but also to be able to communicate and interact better. These students' ability in reading and counting is crucial to enhance functional abilities specifically for students with special needs who face difficulties coping with regular academic education. A total of 8 students with special needs in SK Seri Gading showed their potential and ability in mastering reading, writing, counting, and fine motor skills.

4. Conclusion
The researchers hope that this innovation project will be one of the useful sources and methods in 21st-century learning. It can also be a part of the technology in teaching and learning, encourage student exploration as well as provide an exciting learning environment.

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EMBRACING LOCKDOWN WITH LOVE

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1. Introduction

The love of motherhood is abstract in nature. However, it still needs to be revealed so that mothers and children can appreciate it. As a result, the creation of #Humairazainon that is available on Facebook. Play-based approach activities which are experienced between a mother and a child are shared openly. This serves as a healthy learning and developmental process for parents and caregivers [1]. At the same time, the children are able to learn through play and exploration activities. In a safe and stimulating environment, children learn the skills they need for life, such as regulating emotions, communicating, thinking, problem-solving, moving and being with other people. Moreover, in today's world, children are easily distracted by screen time. Thus, the number of children showing symptoms of nature deficit disorder is arising [2]. The symptoms such as depression, hyperactivity, boredom, and reduced motor development are feared to be increased especially during the Movement Control Order (MCO) period. Therefore, #Humairazainon, the combination of activities such as science experiment, messy play, physical play, dollhouse play, and letter play that can inspire learning and promote creative experiments is strongly proposed. Besides, most of the materials used are recycled materials that are easily accessible and cost-free.

2. Methodology

Only three simple steps are needed:
  i) Type #Humairazainon on Facebook.
  ii) Choose a suitable activity
  iii) Play!

3. Results & Discussion

#Humairazainon was developed in 2018 and the content has been continuously upgraded. This innovation received several positive feedbacks from parents who applied #Humairazainon activities with their young children.

4. Conclusion

It is hoped that #Humairazainon will help our young children to get through the Movement Control Order (MCO) period.

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TEACHING ON THE GO

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Keywords: Knowledge, Online learning, Skill, Teachers, Teaching.

1. Introduction

The COVID-19 outbreak in March 2020 has changed the landscape of education in Malaysia. MOHE had introduced PDPR, a home-based teaching and learning initiative. To conduct classes smoothly, proper guidelines and directions were given to the students and parents to facilitate the adaptation to this novel approach to learning [1, 3]. The online learning system is defined as distance learning, online learning, and network learning [2]. Hence, the introduction of this book will assist the teachers, by providing training and guidance to improve their knowledge and skills in online teaching.

2. Methodology

A book was published from this study, with three modules covering Google Meet, Google Classroom and Facebook private group. The writing process of the book took three months; from February to April 2021.

3. Results & Discussion

Teaching On The Go project had successfully published a book as a guide and reference for teachers. This book serves as a medium for improvement in conducting classes, as well as increases the knowledge and skills of the teachers. It has also succeeded in generating income for the university, research, and innovation. The modules were also successfully implemented at a secondary school in Segamat, Johor.

4. Conclusion

In conclusion, we anticipate the improvement of skills among teachers in teaching and learning activities by using various methods, on account of the guidance from this book.

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CSI-KIT NAVIGATOR

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1. Introduction

Corporate social investment (CSI) provides a unique opportunity for businesses to engage with the society. It provides a platform to assist businesses to develop programs and partnerships that will bring about substantial change to the local community. It involves businesses recognising that they have responsibility towards the wider stakeholders by investing their resources in the community which in turn leads to enhanced social cohesion and spirit of coordination. Nevertheless, the reporting of corporate social investment information is very inconsistent. In addition, many fail to highlight the linkages between their CSI initiatives with their business strategy and Sustainable Development Goals (SDGs). The absence of clear categorisation of CSI rendered it difficult for firms to link their CSI initiatives with business strategy. It also causes difficulty for stakeholders to perform appropriate analysis and make comparison. Accordingly, a model and system presented in this research provides a platform for a more informative environment that facilitates better accountability, transparency, and decision-making with regards to CSI [1-3].

2. Methodology

The model was developed based on the world-renowned sustainability guideline that is Global Reporting Initiatives (GRI). Based on the social reporting guideline stated in the GRI Standard, a model was developed that suits the Malaysian scenario of disclosure of corporate social investment.

3. Results & Discussion

The main functions of CSI-KIT (Corporate Social Investment – Keep It Transparent) Navigator are: (i) to formulate a systematic categorisation of the various types of corporate social investment involvement made by firms and (ii) to identify which type of CSI category and directly mapped it to SDG to be highlighted as part of their sustainable business strategy.

4. Conclusion

CSI-KIT Navigator is a unique model as it measures corporate social investment from a broader perspective to include monetary and non-monetary giving. Further, it helps to tie corporate social investment to the firm's strategy and entrench it into the firm's corporate culture.

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ARAU POETRY FESTIVAL: A THERAPEUTICAL CREATIVE AGENT OF CHANGE

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1. Introduction

Arau Poetry Festival 2020 created as a platform to foster a culture of creative writing and expressions during the pandemic for UiTM Perlis Branch academic staff and local communities. It was a one-day-event that was held using an online conferencing platform of Google Meet where 25 poets presented their poems on the theme Metamorphosis: Poets' lenses in English, Bahasa Melayu, Mandarin, Arabic and Japanese. COVID-19 pandemic forced changes and disrupted existing norms that ordinary citizens were used to and they had to accept and embrace these changes. Due to social distancing which creates social isolation and escalates depression among citizens, Arau Poetry Festival 2020 was the perfect outlet to relieve and share their acrimony besides to record the changes and what they have experienced before and during the new norm.

2. Methodology

Narrative inquiry was used in this project. The poets reflected on changes they experienced throughout their lives such as their fears, obstacles and lessons learnt from such changes by writing two poems in any poetic style that best reflects their feelings. On the day, they presented their poems and the audience asked questions regarding the poems. Data were analysed using thematic analysis.

3. Results & Discussion

The findings revealed that poets shared their experiences regarding changes with emerging themes like dealing with changes, being at a new workplace, holding a new job, sharing parental hope, finding selves, dealing with the pandemic, and finding the joy and meanings of living. Sharing and exchanging views on life challenges and changes in a non-judgmental environment released stress and built connections in a safe environment [2].

4. Conclusion

Expressing and sharing experiences with life changes at an online poetry festival enable participants to accept and embrace changes effectively [1]. Arau Poetry Festival is a creative therapeutic outlet for them. Collaborative auto-ethnography will be proposed in our future research.

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INCORPORATING DIGITALIZATION INITIATIVES IN THE ISLAMIC BANKING INDUSTRY

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Keywords: Digitalization, Fintech, Islamic banking, Shariah, Technology.

1. Introduction

The 4th Industrial Revolution has accelerated the usage of credit cards, automated teller machines, computerised stock trading and online banking in the financial industry, with the advent of blockchain technology. Malaysia, as one of the world's major Islamic finance markets, understands the need of maximising the benefits of digitization projects. In terms of readiness, Malaysia ranked 31st (out of 139 world countries) by the World Economic Forum's Network Readiness Index [1].

2. Methodology

The study employed a qualitative research method using a library research approach.

3. Results & Discussion

Digitalization in this context refers to the digitization of all the standard Islamic Finance products and services. In 2020, Malaysia Central Bank issued an e-KYC policy document to allow the opening of accounts and related transactions to be conducted digitally. Fintech is growing at an exponential rate which leads to the emergence of innovative business models [2]. To provide an impetus for the growth of Fintech companies, the Malaysia Digital Economic Corporation (MDEC) launched the FinTech Booster in August 2020 and some initiatives include:

1. The Orbit - a co-sharing space.
2. FinTech Academy - providing lectures and modules on FinTech.
3. Accelerators - opportunities for domestic and international investments.
4. Financial Innovation Lab - speeding up innovation in digital financial services.

Some Islamic Finance scholars have highlighted some of the legal and regulatory concerns about applying Fintech in the Islamic Finance industry. It is the risk of money laundering, terrorist financing, cybercrimes, tax fraud, consumer protection, and unclear rights [3].

4. Conclusion

In this era, it is difficult to reject the myriad technological wonders that science has brought into our lives. E-banking and largely internet-based services has grown in popularity as one of the most advanced technologies. To ensure Islamic business operations follow shariah rules, Islamic financial institutions must incorporate basic features of digitalization into shariah governance.

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MALAYSIA AS AGEING SOCIETY BY 2030: INITIATIVES ON ELDERLY ASSISTANCE

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Keywords: Elderly, Old country, Population ageing, Senior citizen, Welfare.

1. Introduction
Malaysia is on its way to becoming an ageing society by 2030. The proportion of older persons is growing at a faster rate than the general population. The pace of population ageing is much faster in developing countries compared to developed countries [1]. Hence the ageing of the population can no longer be ignored and must be seriously discussed on the preparation and opportunities in facing their ageing life.

2. Methodology
The study adopted a library-based qualitative research method and content analysis was employed in analysing the data.

3. Results & Discussion
It is suggested for the relevant authorities to develop policies, to guide development programs towards a comprehensive elderly care that covers social, economic and health aspects [2]. Among other initiatives are:
i) Monthly Elderly Assistance, care and protection, counselling, recreational activities, health care, occupational therapy, and physiotherapy,
ii) Respite Care in institutions and Community-based programs,
iii) Senior Citizens Activity Centre (PAWE) - National Policy for Older Persons and Plan of Action for Older Persons since 2001 [3]
vi) Age-Friendly City pilot project.

4. Conclusion
The government is responsible for providing elderly with the best services and facilities. The senior citizens should not feel left out and should receive equality in life even if they are not seen to be as productive as the young generation.

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EVA: AN ELECTRONIC EVALUATION FOR LECTURERS' TEACHING PORTFOLIO

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Keywords: Evaluation form, Electronic portfolio, Lecturers, Teaching portfolio.

1. Introduction
Evaluating a lecturer's teaching portfolio is an immense responsibility. The present innovation suggests an electronic evaluation form (EVA) for Lecturers' Electronic Briefcase (LEB), an e-teaching portfolio. The problem that led to the present innovation is the initial form was in hardcopy form and an attempt to use google form unfolded difficulties to display the feedback to auditees. Displaying the google form individual feedback in pdf form used too many pages with large fonts while producing it from generated Google sheet (cum pdf form) only resulted in lengthy horizontal rows and sharing personal results was a challenge. Therefore, the objective of the present innovation is to enable LEB assessment to be executed electronically with a feasible feedback evaluation form display for auditees suitable for promotional use.

2. Methodology
2.1. Piloting EVA,
EVA is a word.doc file with developer design control panel features and an embedded Visual Basic function. Drop down options are made available in EVA for auditors. Options are available from name of auditors, auditees, status of items (not applicable, complete, incomplete and not available), marks (-1 to 2) and make comments. Security features were added as in [1]. EVA allows items compiled to be calculated using the *fx* formula, (=sum(above) available in the layout tab. The calculation of percentage was innovated to appear on the home tab, "CalculatorLEB", made using the Visual Basic function.

Auditors can then type the percentage gains by the auditee.

3. Results & Discussion
EVA was piloted to assess 30 electronic teaching portfolios. The ease of use was significant and it solved the mentioned problems. The auditors, however, feel using google form can simplify report generating and to enable macro function is a challenge for some. Figure 1 shows EVA with "CalculatorLEB" on the top right hand corner and the percentage calculator dialogue box.
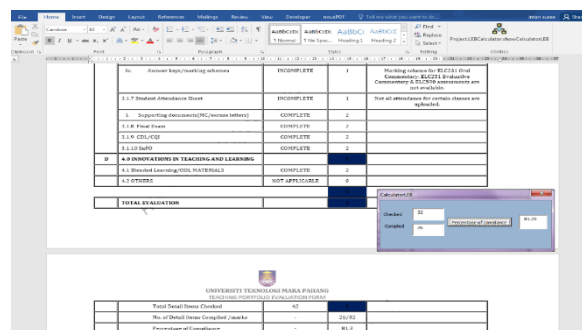
Figure 1. EVA

4. Conclusion
EVA solved LEB evaluation display issues. Future innovation may include a mechanism to ease report generating while further offering ease of use for both auditors and auditees of LEB.

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SOCIAL ENTREPRENEURSHIP MODEL TO ENHANCE SOCIO-ECONOMIC STATUS FOR INDIGENOUS COMMUNITY VIA SOCIAL MEDIA PLATFORM

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Keywords: COVID 19, Indigenous, Online business.

1. Introduction

COVID-19 pandemic has really changed the world. Implementing Movement Control Order is one of the first steps introduced by the Malaysian Government to break the COVID-19 infectious chain. MCO enforces stay-at-home orders, prohibits outdoor activities such as interstate travel, and closes all businesses except for a few designated essential services. As the minority community with no fixed income, lack of education and unable to adapt to the new norms [1], the indigenous communities in Malaysia are indeed facing the severity of the impact of the COVID-19 pandemic. The indigenous people who depend on fishing, permanent agriculture, hunting, and food gathering lost their income because of the MCO [2]. As an effort to enhance the socio-economic status of the indegenous community during the MCO a Social Entrepreneurship model was developed.

2. Methodology

There are three stakeholders involved in the model, namely the higher institution, indigenous community, and the Department of Orang Asli Development (JAKOA). Each of the stakeholders carries their own responsibility to serve the indigenous community to enhance their socio-economic status via the usage of social media platforms such as Facebook. The Higher institution will contribute the manpower which will be attached to the merchants from the indigenous community. The role of JAKOA is to give information regarding potential merchants who need to be trained.

3. Results & Discussion

4. Conclusion

This model is anticipated to empower indigenous business communities and entrepreneurs, providing communities with new ways to earn income and increase productivity.

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TCD (TABLE CONNECTOR DESIGN)

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Keywords: Academic writing, Software, TCD, Writing skill.

1. Introduction

Since writing is a crucial skill in academic and career success, students need to be able to write independently using every support and technological method available. Writing skills such as writing in a way that communicates ideas clearly and concisely, builds reasoned arguments, organizes evidence and generates ideas are critical and are applied widely. A student's inability to express ideas in writing with accuracy and sophistication risks them being rejected from colleges, universities and many areas of professional employment [1-2].

2. Methodology

The design and development research (DDR) approach was used to develop the software. Due to its pragmatism in testing theory and validating its practicality, the use of DDR as a select approach is justified.

3. Results & Discussion

This software assists researchers and students in preparing to write their research proposals. This innovation focuses on the understanding and skills in organizing important information necessary in academic writing. As an added value, TCD software can improve users' skills and understanding of problem-solving in academic writing. Based on the survey data, most users were satisfied with this software (75%) and admitted "the software is easy to use", "the software is user friendly" (85%), "this software meets the writing needs" (78.4%). The figures show that users can improve their academic writing by using technology (TCD software).

4. Conclusion

This software is a structured, innovative and systematic technological innovation project facilitating the process of academic writing, scientific journals and others. Systematic writing needs to be planned with a robust method to strengthen the writing in a structured manner. Therefore, this software is able to strengthen academic writing to be more structured, clear and systematic while educating the writer on the demands of writing for different purposes.

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GLOBAL EDUCATORS PROGRAM

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Keywords: Academicians, Covid-19, Expertise, Knowledge-sharing, Thematic analysis.

1. Introduction

The Global Educators 2020 program @ Academy of Language Studies, UiTM Perlis Branch provided a platform for its academicians to share their knowledge in series of talks/workshops during the Covid-19 pandemic among UiTM Perlis Branch staff, academicians from other institutions and also counterparts from University of Mandalay and Yangon Technology University, Myanmar. The program was carried out in 6 days where 9 speakers shared their expertise/knowledge with altogether 98 participants. Malaysian Higher Institutions are expected to keep embracing challenges and expand the culture of knowledge dissemination, thus, the Global Educators Program marked the effort and recorded a significant knowledge impact during the pandemic
.

2. Methodology

Learning and knowledge sharing methods were applied in this project. The speakers shared their knowledge on their areas of expertise like postgraduate supervision, writing grants, qualitative studies, international collaborations, preparing a memorandum of understanding (MoU) and JASP for quantitative data analysis. The speakers first explained their subject-matter and second, enhanced participants' understanding through question-answer sessions. Data were examined using thematic analysis.

3. Results & Discussion

The findings showed that the speakers focused on themes like self-discipline, perseverance, grit, collaborative work, communication, interest, enthusiasm, diligence, critical thinking and writing, systematic analysis and accuracy. Academicians critically need knowledge sharing [1] and human experts are often needed to contextualize information in knowledge-sharing [2].

4. Conclusion

Sharing knowledge and expertise among academicians enabled the speakers and participants to expand their horizons, increase efficiency and build rapport. The Global Educators program was an innovative project that provided the platform for such a practice to happen. A focus group analysis will be proposed in our future work.

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MEMORY AID KIT(MAK) V.2 FOR TEACHING ACCOUNTING THEORIES

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1. Introduction

Mnemonic is one of the techniques used to help remember ideas or phrases [1]. It has proven effective in assisting students to recall new information [2]. It was observed that accounting students enrolling in a financial reporting course could not answer accounting theories questions well because the concepts are comparatively abstract and interrelated [3]. Therefore, the objective of this study was to develop a memory aid kit (MAK) in improving the students' understanding of accounting theoretical topics during online learning class.

2. Methodology

96 students taking Financial Accounting and Reporting 3 (FAR 3) were chosen and separated into two groups (with mnemonic training and without mnemonic training). Mnemonic technique (acronym & images) was developed relevant to the subject which consists of a compilation of basic concepts, facts, and accounting terms.

3. Results & Discussion

The finding showed that the average score index for students with mnemonic training was 4.985 higher than those without mnemonic training. The p-value for the dummy mnemonic training (p=.000) was very significant, suggesting that there was statistical evidence of a difference in average score index between the students with mnemonic and no mnemonic training. In addition, the R-squared value of 0.752 for the model exhibited that the model was a good fit.

4. Conclusion

Based on the findings, it is concluded that MAK is effective in helping students remember and recall factual information related to accounting theories.

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INVERTED UBIQUITOUS LEARNING MODEL

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Keywords: Ubiquitous learning, Collaborative learning, E-Learning tools, Active learner

1. Introduction

Inverted Ubiquitous Learning Model (i-Ubiq) is an innovative pedagogical approach to nurture higher education students at the international platform. It is a collaborative learning model that was developed to nurture active learning skills for the 21st century learners by inversing the participant-presenter roles [1-3].

2. Methodology

i-Ubiq was performed by integrating several e-learning tools to customize active learning activities and lessons via virtual colloquium (See Figure 1). The model was tested on 500 students and lecturers of UiTM Perlis and Universitas Airlangga on 21 June 2021.

3. Results & Discussion

Several practical recommendations could stem from the i-Ubiq colloquium: 1) creating a base for large-scale collaboration and implementation; 2) increasing technology innovation effectiveness in stimulating international collaborative learning, particularly online learning; improving time and cost efficiency of education. Besides, it was also found that the adoption of i-Ubiq in a higher education (HE) system positively affected education itself and improved the students' skills as active learners.

Figure 1. i-Ubiq Learning Model

4. Conclusion

i-Ubiq offers a new pedagogical concept in exposing the global learning environment to higher education students and lecturers; and ensures time efficiency in education.

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SOUNDS OF FICTION: USING SONGS TO TEACH SHORT STORIES IN THE ESL CONTEXT

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1. Introduction

The "Sounds of Fiction" (SOF) is a project aimed at using works of fiction in the ESL classroom. This approach carefully utilizes songs in the teaching and learning of short stories. Using the lyrics of songs as literary texts, this approach helps learners to analyse, discuss, and study fiction in a more engaging and entertaining way. The approach applies to a shorter form of fiction i.e., a song. In this study an original composition based on the short story "The Necklace" [1] written by Guy de Maupassant, was used to expose ESL learners to literary elements, namely plot, theme, characters.

2. Methodology

This study adopted a quantitative methodology whereby data were obtained from scores achieved by the participants in a task that was designed to evaluate understanding of the plot of the story "The Necklace" by listening to a song composed based on the story. The participants were 28 diploma students from UiTM Cawangan Pahang.

3. Results & Discussion

Table 1. Mean and standard deviation of learners' scores

	M	SD	N
Score	8.4	1.5	28

Table 1 shows that the mean score obtained by the students was considerably high; 8.4/10.

Table 2. Frequency and percentage of scores

Score	Frequency	Percentage
High	23	82.1%
Average	3	10.7%
Low	2	7.1%
Total	28	100

Table 2 shows that a large majority of the students or 82.1% obtained high scores, while only 10.7% and 7.1% recorded average and low scores, respectively. The findings indicate that students understood the plot of the story through their understanding of the lyrics of the song.

4. Conclusion

The study reveals the promising potential of originally composed songs in the teaching and learning of fiction. The positive reactions of the participants when introduced to the song "The Necklace" lead to the conclusion that using songs is an interesting and engaging approach to the teaching and learning of literary texts in the ESL classroom.

Acknowledgments

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FEATURES AND SPECIFICATIONS OF SENIOR RESIDENCE SAFETY: EXPLORING CARE CENTER PERSPECTIVES

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1. Introduction

Seniors enrol into care centers to obtain advanced levels of care in a safe and supervised environment. Therefore, safety is the most important aspect when looking for a care center or nursing home for them. When dealing with the vulnerable elders, it is important to maintain a home-like comfort atmosphere while balancing their safety and independence at the same time. Family's expectations of modern nursing homes are now forcing the care center owners and management to examine current approaches to overcome common problems and concerns [1-2].

2. Methodology

The study adopted a qualitative method through observations, library-based research by content analysis and structured interviews.

3. Results & Discussion

Findings show that the daily life and routine of older adults is affected and may be changed by physical and social features of the built environment [1] and risking injury. Certain aspects of the environment and the settings to which older people are daily exposed also upsurge their safety risk, for example, falls [2]. Since safety is an individual right, it is suggested that the respective municipalities implement a systematic assessment of housing or building standards in all care centers for the seniors. Hence, this process would benefit from an open discussion with housing companies and service providers from the private sector.

4. Conclusion

There are specific requirements and designs required to maintain the safety of the elderly residing in care centers. Although many private companies are involved in delivering services to the care centers, the municipalities should be the responsible body to ensure that these services are properly delivered and rules are properly adhered to.

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COVID 19 E-BOOK: HOW MALAYSIA IS FACING IT

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1. Introduction

The Covid-19 pandemic has spread all over the world including Malaysia. Covid-19 is a dangerous and highly infectious coronavirus (CoV) which attacks the human respiratory system. The tests that are conducted to detect the Covid-19 virus are the molecule test (PCR) and antigen test (RDT). To cope with the threat of this dangerous virus, Malaysia has set up a Special Committee on Ensuring Access to COVIC-19 Vaccine Supply (JKJAV) to ensure that all individuals in Malaysia get vaccination and protection against Covid-19 virus. Accurate information also needs to be channelled to the community so that they can protect themselves and their families from Covid-19 infection. Therefore, an e-book was produced that contains information regarding the management of Covid-19 in Malaysia [1].

2. Methodology

The e-book was produced using Microsoft PowerPoint, A4 size. The graphics were imported into PowerPoint. All information regarding Covid-19 in Malaysia was gathered from various sources. The structure of the e-book was according to the standard format from the National Library of Malaysia. The discussion among team members was conducted via online meeting.

3. Results & Discussion

An e-book of 42 pages was produced. This e-book gives information about the Covid-19 disease, the symptoms, the tests that are being carried out, methods of quarantine, vaccination programmes and management by the Malaysian government and the Ministry of Health in addressing the Covid-19 pandemic.

4. Conclusion

This Covid-19 e-book aims to disseminate important information about Covid-19 virus more quickly and easily. This e-book provides a lot of information such as the symptoms of Covid-19 infection, the tests conducted by the Ministry of Health to detect the virus and the efforts that are implemented by the Malaysian government to curb the spread of the virus. Hopefully, this e-book can give awareness to the community to be more responsible to perform self-assessment and monitor their health during the Covid-19 pandemic.

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Ei-Si – APPLICATION MODEL OF INITIAL EMOTIONAL CONSULTATION

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Keywords: Counsellor, Emotions services, Mobile apps, Patient.

1. Introduction

The percentage of Malaysians who suffer mental illnesses is increasing. However, most Malaysians are unaware that they are actually in a poor mental state and emotional health, so much so that they do not visit state counselling centres to diagnose their psychological health. The simple application of *Ei-Si* was designed to make it easier for patients to first identify their emotional level before seeking professional help. The *Ei-Si* mobile app provides emotional intelligence level measurement services to clients who are likely to require further treatment [1-2].

2. Methodology

This study used a quantitative method by distributing questionnaires to collect the data. The instrument was constructed based on the selection of questionnaire items from previous studies.

3. Results & Discussion

The process of using this application can be seen in Figure 1 below:
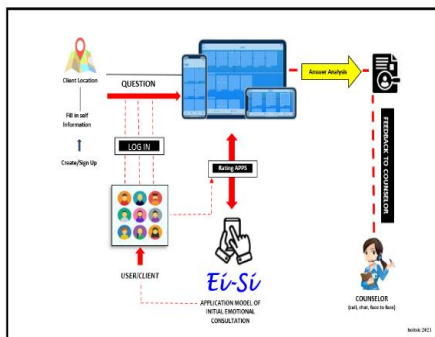
Figure 1: Process of using Ei-Si application

4. Conclusion

Measuring emotional intelligence with spiritual intelligence is very important for Malaysians, especially since good emotions can cultivate a more prosperous life while also reducing psychological problems.

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CURBING TARGET PANIC: ONCE AND FOR ALL

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Keywords: Archery, Archery performance, Sports psychology, 'Target panic'.

1. Introduction

Target Panic is a disruption of an archer's rhythm, routines, and techniques due to psychological and neurological conditions [1]. The purpose of this study was to understand this disturbance and obtain latest feedback on how to mitigate target panic, through the feedback received.

2. Methodology

This study used a 'multi-method' qualitative approach that involved interviewing 10 National and International level archery coaches at State Training Centers.

3. Result and discussion

The results of the study show that archers experience 'Target Panic' problems after reaching the high score target, after practicing for too long, after not practicing for a long time and others (eager to hit yellow, changing equipment, over thinking). The main types of target panic are in line with previous studies (Holding, Premature release and mixed) [1-2]. However, this study found there was an additional type of target panic namely *'loss of balance and coordination'*. Based on the findings, the solution to overcome 'Target Panic' from the perspective of coaches in Malaysia was formulated in a mind map as the following:

Figure 1. Curing target panic

4. Conclusion

Better understanding of target panic, will help coaches at various levels to deal with target panic promptly and effectively.

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RUNNING MEET

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1. Introduction

Increasing learners' level of engagement has been one of the challenges faced in Online Distance Learning due to COVID-19 [1-2]. This study aims to elevate the way language is taught by creating a virtual race that tests learners on various language skills.

2. Methodology

2.1. Survey

Participants were to complete a virtual race by accomplishing language tasks in seven checkpoints administered via Google Meet. Upon completion, a questionnaire was distributed to the participants and the instructors to gain their feedback.

3. Results & Discussion

The results show that the best features of the programme are the variety of skills tested (92.3%) and the interesting design (69.2%). 46.2% chose learners' lack of interest and engagement as the problem that the programme was able to solve. 53.8% agreed that learners were very responsive during the programme. 69.2% believed that the quality of the programme is better than other existing apps. Majority rated the programme 'very good' (53.8%).

4. Conclusion

Running Meet may increase learners' level of engagement and interest in learning language due to its creative design and the incorporation of various skills.

Acknowledgements

The authors would like to express their gratitude to the APB Running Meet 2021 committee members for their outstanding contribution in the programme.

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ELLENA: A MOBILE BLENDED LEARNING ROLE PLAYING GAMES APP FOR EFL/ESL READING

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Keywords: Application, EFL/EFL, Reading, Role playing games apps.

1. Introduction

Maintaining focus while reading can be a challenge for many. The present innovation seeks to assist English for Foreign/Second Language (EFL/ESL) speakers to maintain focus in reading and learning English comprehension. The innovative role-playing games (RPG) app called ELLENA, allows students to choose interesting story plots and answer reading comprehension in the form of challenges or tasks. The problem that led to the study is students' poor reading attention span.

2. Methodology

The Technology Acceptance Model (Extended TAM) model and questionnaire [1] is used to find out 30 EFL/ESL students' perception while playing ELLENA. Only the section of perceived usefulness which seeks to unfold whether the innovative ELLENA can improve students' reading attention span is reported here.

3. Results & Discussion

The result of the study shows that students thought the media is good and suitable to use. This is consistent with the teachers' formative evaluation. They considered the game as good and can be used for teaching and learning processes during online distance learning (ODL) such as during Covid19 pandemic. Figure 1 below shows students' perceived usefulness of ELLENA as an MoBL tool.
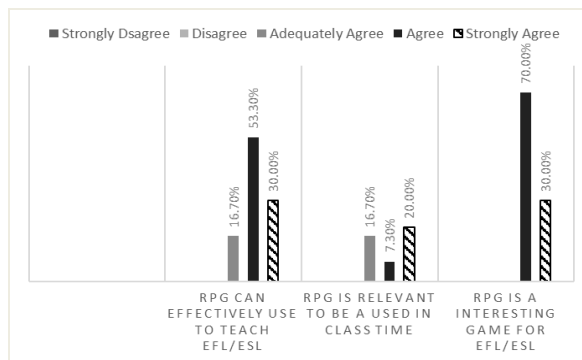
Figure 1. Perceived usefulness

4. Conclusion

ELLENA enables students to install the application to their devices and maintain their attention in RPG based reading. Thus, ELLENA is perceived useful as a MoBL reading comprehension teaching tool.

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SMART SIMMATCH (V2): AN INTERACTIVE TOOL TO TEACH HIJAIYAH LETTERS AND TAJWEED RULES

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Keywords: Al-Quran, Card games, Hijaiyah letters, Inductive learning.

1. Introduction

SMART SIMMATCH (V2) is a teaching package developed to teach Al-Quran recitation. The package consists of a stack of letter cards, a poster and a teacher manual that can be used to teach the (i) articulation/pronunciation of individual Hijayah letters, (ii) recognition of the different forms of connected Hijayah letters and (iii) tajweed rules, in a fun and interactive manner. Card games were adopted as the teaching method. The method is underpinned by the principles of inductive learning, which involves learning by observing patterns [1]. Instead of being directly taught the different forms of Hijaiyah letters and the tajweed rules, participants learned them by observing the patterns they encountered when playing the card games.

2. Methodology

A qualitative case study methodology was adopted in the study. It involved observing the progress of 5 participants during the application of Smart Simmatch (V2) approach over a period of 3 months. All the participants were taught the fundamentals of Quran recitation (i.e., recognizing & pronouncing individual and connected Hijaiyah letters and the tajweed rules) using the Smart Simmatch approach.

3. Results & Discussion

The following table summarises the results of the observation conducted on one-to-one session with the five participants:

Table 1. Results of Observation

No		Findings
1	A 5-year-old boy with difficulties in learning Hijaiyah letters using conventional methods.	Subject was able to recite phrases from the Al-Quran with minimal assistance after three months being taught using Smart Simmatch.
2	A 20-year-old college student with zero knowledge of Hijaiyah letters.	After 1 hour and 19 minutes, the subject managed to read phrases from the Al-Quran after being introduced to Smart Simmatch.
3	A 26-year-old housewife, who was not able to recognize connected Hijaiyah letters.	Subject successfully mastered all Hijaiyah letters within 2 weeks and was able to recite the Al-Quran smoothly after 3 months.
4	A 46-year-old mother, with some basic knowledge of tajweed rules.	In the beginning, the subject committed approximately 60% errors in her Al-Quran recitation. After being introduced to Smart Simmatch, recitation accuracy improved to 80%.
5	A 17-year-old teenager who had approximately 30% fluency in reciting the Al-Quran.	Subject was able to increase his recitation skills to 50% after using Smart Simmatch cards to learn tajweed.

4. Conclusion

Based on the findings of the study, Smart Simmatch (V2) approach was able to cultivate and sustain participants' interest and help them increase their ability to recite the Al-Quran.

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ENJOYMATHS 2.0: FRACTIO TO DECIMO POKETTO

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Keywords: Mathematics games, Card games, Interactive games, Fraction, Ratio.

1. Introduction

Due to the COVID-19 pandemic, education nowadays seems to be more challenging for most primary and secondary school students, especially in understanding the Mathematics subject [1]. Parents play a crucial role in tackling the difficulties faced by their kids. Hence, an upgraded kit was developed in helping kids understand and master the Mathematics subject with parents' involvement. An improved version of Enjoymaths 2.0 comes with two additional basic mathematical skills related to ratio and fraction.

2. Methodology

The first version of this game serves as an instructive kit to assist kids with learning basic fraction and time skills. Enjoymaths 2.0 is a moderate level learning kit that involves essential operations in ratios and fractions. This upgraded kit exposes kids to advanced skills that could enhance their intelligence faster than their actual age. Kids who play this game will not be experiencing failures as they have a high potential to succeed. This game is also free to be played in a group of many people, repeated for many times, anywhere, and at any time.

3. Results & Discussion

Figure 1 shows an increase in the range score for pre-, and post-Mathematic tests conducted among 84 students. This illustrates that Enjoymaths 2.0 is one of the tools that could be used to improve kids' performance in Mathematics.
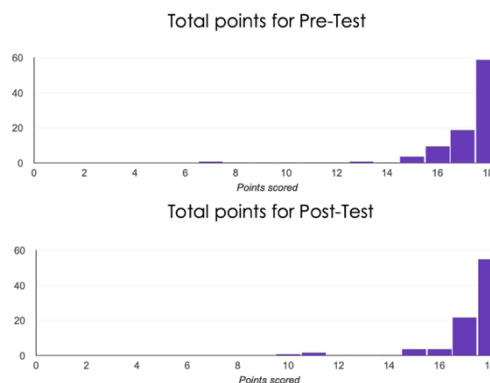
Figure 1. Range score for pre and post- test.

4. Conclusion

This initiative was developed particularly to overcome the challenges encountered by primary students, and to help parents in teaching Mathematics at home during the pandemic. In the near future, Enjoymaths will be upgraded as a digital application, where it can be played using mobile phones and other electronic devices.

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ONLINE IMPLEMENTATION OF CA-T LESSONS AND CHALLENGES TO BE OVERCOME IN ENGLISH CONVERSATION TEACHING

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1. Introduction

In promoting Conversation-Analysis (CA)-informed teaching (CA-T) of conversation to EFL learners, CA-T Model lessons were introduced and trialed in a face-to-face classroom environment [1]. Hoping to empower non-native teachers to teach English conversations to their students with more confidence, the pilot study affirmed the benefits of CA-T revealed in previous literature for enhancing Thai EFL learners' conversation skills. However, there were certain challenges to be overcome to make CA-T lessons work. Drawing on this pilot research, the current experimental study aimed at exploring the effectiveness of CA-T lessons taught in a completely virtual environment necessitated by the ongoing COVID19 crisis. It hoped to determine whether CA-T lessons are still beneficial for developing learners' conversation skills in a virtual teaching environment and to uncover the challenges in making the lessons more effective.

2. Methodology

2.1. Participants

Participants included 60 first-year English majors under the Faculty of Liberal Arts, Princess of Naradhiwas University.

2.2. Procedures

The students were engaged in a pre- and post-role-play to measure their conversation performance before and after an intensive CA-T lesson treatment. Observations were made during teaching and an opinion survey was conducted to obtain the students' feedback.

3. Results & Discussion

Overall, the results from this research confirmed the benefits of teaching CA-T model lessons even in an online platform. However, extra time and practice exercises are needed by the students. From the teacher's perspective, activities originally requiring face-to-face interaction need to be adjusted and it is essential to allow for more conversation practice after class and to get students to submit their audiovisual recordings of the practice for teacher feedback. Moreover, the limitations of internet connection and students' behavioral factors need to be overcome to make CA-T lessons more effective for online teaching.

4. Conclusion

While CA-T lessons remain effective in improving learners' conversation ability via an online teaching platform, adjustments need to be made by both teachers and students to enable the lessons to achieve the expected outcomes.

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E-ZAWAF: ONLINE ZAKAT APPLICATION AND DISTRIBUTION SYSTEM

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1. Introduction

The worldwide COVID-19 pandemic has caused the death toll to reach 4 million people. The World Health Organization (WHO) recommends practicing social incarceration and avoiding the 3Cs, namely crowded places, confined spaces and close conversation. In Malaysia, the Movement Control Order (PKP 1.0) was enforced on 18 March 2020 to curb the spread of the COVID-19 epidemic. The order covers the ban on public gatherings, restrictions on foreign tourists, the closure of all educational institutions and the closure of government and private premises.

The closure of business premises harmed employers and at the same time, retrenchment had to be taken. Statistics show the unemployment rate jumped to 5.3 percent (826,100 people) in May 2020 [1]. This indirectly affects the financial implications of children's education, especially those who are pursuing higher education institutions (IPT). Aware of the problems faced, the Zakat, Waqaf and Sadaqah Unit (ZAWAF) of Universiti Teknologi MARA (UiTM) Perlis Branch, has developed e-ZAWAF to help students affected by the COVID-19 pandemic.

2. Methodology

e-ZAWAF was developed in March 2020 to facilitate the application and distribution process of zakat to UiTM Perlis students. The system uses Google Sites as a web page and Google Form for the preparation of application forms and zakat assessment. To ensure the security of students' personal information remains optimal, the SpreedsheetConverter application is used. A total of 28 lecturers from various faculties were appointed to expedite the zakat application interview process.

3. Results & Discussion

The findings of the study found that the duration of the application process and distribution of zakat can be reduced to 2 months compared to 3 months (manual application method) which was practiced previously. In addition, student information can be stored in a digital database to facilitate information retrieval in the future.

4. Conclusion

Hopefully, the e-ZAWAF system can be a platform in helping UiTM Perlis Branch students who need financial assistance.

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SELF-PSYCHOSPIRITUAL THERAPY
THROUGH THE *SYIFA' TO YOU (SYIFA' 2U)* MOBILE APPLICATION

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Keywords: Application, Mental, Psychospiritual, Spiritual, Soul, Therapy.

1. Introduction

The mobile application, *SYIFA 'TO YOU (SYIFA' 2U)*, is a self-psychospiritual therapy application to aid spiritual and mental health patients. This application was designed as an early therapy approach for the mentally ill. The latest approaches in self-therapy and early treatment show that technology helps in improving spiritual and mental health in a quick, efficient and flexible manner. The application focuses on five types of diseases: stress, depression, anxiety, hysteria, hallucinations and social phobias.

2. Methodology

The application was developed using Android technology. The development process was based on the Rapid Prototype model for mobile applications that used the *Apps Master Builder* online platform for Android technology.

3. Results & Discussion

The development of this application is continuous by using a Host Server to ensure fast access and reduce time for Product Deployment. The focus of the development of this therapy application is divided into five stages, which are defining every disease, symptom, cause, treatment and intervention.

Some of the advantages of the application are seen through the flexibility of users in accessing content, multimedia presentations which include text animations, graphics and audio recordings to aid their self-therapy process.

4. Conclusion

The uniqueness of this application helps in treating the five diseases by combining counselling, psychological and psychospiritual techniques.

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AOTB CASHFLOW: GAUGING ITS POTENTIALS DURING COVID-19

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Keywords: AOTB, Cashflow, Teaching tools.

1. Introduction

Cash flow statement is the report required in preparing the financial statement under MFRS 107 [1][2]. Among the issues raised in teaching undergraduate level accounting courses is the methods taught to calculate the cash flows; the T-account approach or the worksheet approach [3]. Some educators prefer the T-account approach as it enables the students to get the most accurate answer, however, some educators argue that this method is time consuming compared to the worksheet approach. Our innovation aimed to solve the problems faced by the educators and students in teaching and learning (T&L) the preparation of the cash flow. Therefore, Accounting on the Block (AOTB) Cashflow came into the picture as an innovative tool for T&L.

The tool is in the form of a mind map with colour coding for debit and credit, and it has an overview of both the direct and indirect methods of calculating the cash flow. The map shows the relationship between the financial statement of Profit or loss and Statement of Financial Position and the cash flow. With both methods shown in one page, the content of the statement can be differentiated easily. This tool also provides a T-account solution so that the students can understand how it works and can choose any methods they prefer. Learning can be effective because the tool recommends a structured process in preparing the statement.

2. Methodology

AOTB Cashflow was tested on 146 accounting students.

3. Result & Discussion

This teaching tool was able to improve students' skills from poor to average (85% strongly agree & agree).

4. Conclusion

AOTB consists of games such as Helirides, Eagleeyes, card games, board games, android games and now with Cashflow, it is able to make T&L of accounting more fun and engaging.

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SULH INNOVATION IN SETTLING THE DISPUTES

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1. Introduction

The modern world is moving fast and requires all disputes to be solved quickly as delays bring loss to the parties involved. Developments and advancement of ICT nowadays has led to a high increase of using online systems. The introduction of Online Dispute Resolution (ODR) a few decades ago in developing countries aims to expand access to justice and provide fast and fair resolutions to disputants. ODR first emerged in the late 1990s as a means of resolving disputes regarding purchases conducted over the Internet. Since that time, a few countries have already recognized and practiced ODR as a dispute resolution [1].

2. Methodology

The study employed a qualitative research method using a library research approach.

3. Results & Discussion

The *Sulh* method is a concept of dispute resolution outside the court and is getting more attention today [2]. While mediation is a process in which a party (third party or mediator) assists two parties to solve disputes and negotiate to achieve a peaceful settlement. There are 18 cases that can be resolved through *sulh* process as stated in Arahan Amalan Jabatan Kehakiman Syariah Malaysia No. 1, 2010. However, it is still unable to resolve the cases within the prescribed period and satisfy the parties. Alternative dispute resolution methods and online resolution have been introduced due to the court justice system being burdened with dumping cases from the late 70s to 90s. Along with the development of technology and ICT, online dispute resolution methods have begun to take the place of traditional methods as they are cheap, time-saving and more satisfying to the parties involved [3].

4. Conclusion

In summary, the *sulh* process conducted in the Syariah Court is capable of reducing up to 70% of the cases filed. With the rapid growth of ICT, online *Sulh*-Based Mediation, therefore, is an appropriate mechanism that would be able to help the disputing parties to resolve their problems without involving the courts and lengthy litigation process.

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A VOICE-BASED APPLICATION SYSTEM FOR AUTISM CHILDREN TO LEARN RECITING THE AL-QURAN (VB-QURAN-AUT)

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Keywords: Human computer interaction, Voice-based, Application system, Autism children, Mobile learning.

1. Introduction

Autistic children have difficulties in handling activities, such as learning. A learning method for them is different from normal children. Thus, this research focuses on the development and the usability of a voice-based application system (VB-QURAN-AUT) to facilitate the children to learn reciting Al-Quran.

2. Methodology

The framework of the app's development is the Iterative-Evolution System Development Life Cycle Model (IE-VB-QURAN-AUT) (Figure 1).
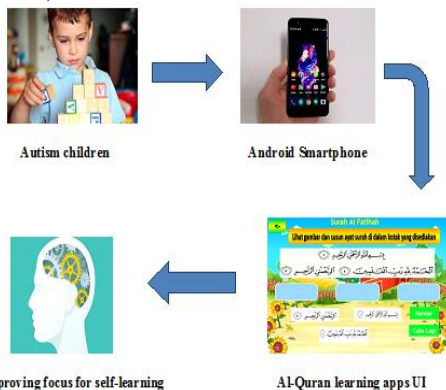
Figure 1. Development Model of VB-QURAN-AUT

3. Results & Discussion

The app (Figure 2) runs on Android and relies on the learning outcomes to ensure the children are able to read Surah through the 3 learning stages: (i) touch and listen; (ii) watch and arrange the Surah; and (iii) listen and arrange the Surah. The app is available in Malay language.

Figure 2. Watch and Arrange of Surah Al-Fatihah

4. Conclusion

Based on the usability testing conducted to the Autistic children shows that it is usable to facilitate the children in learning to recite the Al-Quran.

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THE SAFE HOUSING MODEL FOR ELDERLY: A PILOT STUDY

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1. Introduction

The health and life care of the elderly is being intensified in Malaysia [1]. Many elderly care centres are being built in Malaysia, with the elderly being placed in a daycare or residency. The study discusses the need for a safe housing model for the elderly. At present, the housing concept appears to be less in accordance with the needs of the elderly. The seniors require not just a comprehensive health-care package, but also a safe residence for their survival [2].

2. Methodology

The study employed a quantitative and purposive sampling method. The main instrument was a questionnaire distributed to 30 elders in the state of Selangor.

3. Results & Discussion

Based on the respondents' responses, there are three major factors that the authority concerned should consider when building safe homes for the elderly:

(i) The homes need good technologies and security systems - 80% (24 respondents) agreed, 20% (6 respondents) did not agree.

(ii) The homes need an essential accessibility element - 90% (27 respondents) agreed, 10% (3 respondents) did not agree.

iii) The homes need a peace and calm environment - 70% (21 respondents) agreed, 26.7% (8 respondents) did not agree, and 3.3% (1 respondent) was not sure. The meaning and dimensions of a safe home will be explored in detail in the study.

4. Conclusion

The findings from the pilot study demonstrate the importance of providing safe homes for the elderly. The development of elderly safe homes is necessary as part of our effort to improve their well-being. Hence, the government and authority should refine the guidelines of the safe housing construction model so that it can be a safe home for the elderly [3].

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SOCIAL ENTERPRISE ACCOUNTING AND OPERATING INFORMATION SYSTEM (SERi): MIGRATING TO CLOUD PLATFORM DURING COVID-19

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Keywords: Accounting information, Social enterprise.

1. Introduction

The emergence of social enterprise (SE) is seen as an important development to the wellbeing of humanity in any society. Globally, social bodies have increasingly made themselves visible through thousands of private community groups all over the world [3]. The recent COVID-19 pandemic somehow has affected many enterprises around the globe especially the profit-oriented divisions. However, the role of SE was argued to be more vital among communities that have suffered during the current pandemic [2]. As such, this development should also be aligned with the SE's reporting activities especially on the financial aspect because interest alignment between SE and their financiers is very important in maximizing social impact among them [1].

Due to the new norms, lockdown, social distancing etc. implemented during this pandemic, we have developed the financial reporting system for SE that is benefiting the cloud platform available online. This system hopefully will keep SE operation running efficiently despite the current global pandemic.

2. Methodology

SERi was tested on social bodies such as religious and philanthropy bodies, society and social enterprises.

3. Result & Discussion

The system makes the reporting system of SE more organized, efficient and easily accessible.

4. Conclusion

SERi (cloud platform) has provided more organized and efficient reporting in SE while catering to the new norms environment during the pandemic.

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DISPOSABLE HANDMADE FACE SHIELD

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Keywords: Disposable hand made face shield, Personal protective equipment, Front liners, Pandemic Covid-19.

1. Introduction

The use of a face shield has become essential during Covid-19 pandemic. Beginning February 2020, Malaysia was affected by a series of waves of Covid-19 infections, with the number of daily infections exceeding four figures recently and still displaying an alarming trend [1]. Therefore, to meet the increasing demands of face shields, especially among the frontliners, UiTM Perlis research group is working on the production of economical disposable handmade face shields. The main objective is to minimize the government's burden of supplying personal protective equipment (PPE) to frontliners.

2. Methodology

The disposable handmade face shield is much more affordable and cheaper than most face shields available in the market. Besides, the face shield materials, such as rubber bands, plastic cover, sponge and double-sided tape are readily available. The production involved 3 stages, i.e., cutting and pasting a thick sponge onto a plastic cover for comfort of usage, installing a thick rubber band for tidiness and pasting a sticker onto the shield. Production was quick and efficient even though it was carried out without the use of machines. In terms of commercialization, the face shields have the potential to be marketed both locally and internationally due to their cost-saving nature.

3. Results & Discussion

Due to high demand, production of the face shields has grown from 50 pieces to almost 14000 pieces. The face shields were donated to several hospitals and medical clinics including Hospital Tuanku Fauziah, Hospital Sultanah Bahiyah, UiTM Perlis Health Unit and Sabah State Health Department.

4. Conclusion

In conclusion, this effort has significantly helped support our government in combating Covid19 pandemic and more importantly protect medical professionals from the virus.

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ISLAMIC TRADITIONAL ARCHERY-GOLF-TOP (ITAGoTop) A NEW COMBINATION LEISURE SPORT AND GAMES

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Keywords: Traditional archery, Golf, Gasing, Community engagement, Physical health and spiritual.

1. Introduction

Archery in Islam started from the time of Prophet Adam A.S. continued until the time of Rasulullah SAW and his companions. As Islam spreads, Islamic Traditional Archery also gains popularity in the Islamic communities around the world including Malaysia. Archery is an activity full of discipline and has value to physical and spiritual health of people of all ages and genders. Whilst, Golf is a popular sport worldwide attracting an increasing number of practitioners regardless of age and gender. It involves leisure-time physical activity (low-intensity) and walking for some distance. While, the top (Gasing) is a traditional game. It has its history and origins as well as uniqueness. Gasing is played by spinning the top with a string tightly wound around the top. Then the player holds on to one end of the string, the Gasing is thrown to set it spinning. These three games have sparked an innovative idea of combining them as one sport that can offer differences and attract players of all ages and genders.

2. Methodology

The study adopted a qualitative research method, whereby library research was carried out to gather information regarding the rules of each game such as time calculation, game technique, distance and score calculation.

3. Results & Discussion

This game model proposes self-discipline, creativity and focus. It brings fun that increases physiological health and mental wellbeing.

4. Conclusion

This model has the potential to be a reference to communities and organizations in the effort to achieve the goals of community engagement and well-being. Besides, it also has the potential to become a popular leisure game and activity in Malaysia.

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A SMART-COMFORTABLE-SHARIAH COMPLIANT MUSLIM WOMEN TRADITIONAL ARCHERS' JERSEY-VEST

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Keywords: Jersey-Vest, Smart-Comfortable, Shariah compliant, Muslim women, Traditional archers.

1. Introduction

The Prophet SAW said: "Shoot an arrow, O children of Ismael because indeed your ancestors were experts in archery, so shoot". This hadith is an advice from Our Beloved Prophet SAW for us to learn and be experts in archery. Nowadays, women are also interested in archery. It is proven by the high numbers of women participation in traditional archery leisure activities, training and competitions in Malaysia. Thus, Muslim women archers should be aware of shariah compliant dress code. Observation through training sessions exposed a few possible problems faced by women archers with regards to body movement during the execution skills which could expose the shape of the body. Furthermore, the bowstring may catch the cloth of their headscarf and impede the shooting process, thus affecting their physical and psychological states as well as scores.

2. Methodology

A theoretical study was carried out (qualitative) related to archery techniques and movements, also on the suitability of the fabrics for making a jersey. Next, an observation through an archery training session was conducted to identify some possible problems experienced by Muslim women archers. Finally, the idea of A Smart-Comfortable-Shariah Compliant Muslimah Traditional Archers' Jersey-Vest prototype was proposed.

3. Results & Discussion

A Smart-Comfortable-Shariah Compliant Muslimah Traditional Archers' Jersey-Vest is a prototype of a special sportswear for Muslimah archers that was innovated in the form of an attractive shirt design. It is a combination of a shirt and a vest using microfiber and nylon-mesh fabrics that are commonly used for designing chest guards for the use of archers. It helps Muslim women archers cover their aurat, provide comfort, physical protection (chest) during shooting and highlight the modest characteristics of Muslim women. Thus, this jersey innovation is comfortable, Muslimah-friendly, sweat-absorbing, practical and feminine.

4. Conclusion

This prototype is Shariah compliant and indirectly provides an opportunity for Muslim women to choose the traditional archery as a leisure sport that brings physical and spiritual health.

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THE HUNGER GAMES: GAMIFICATION IN FOOD PRESERVATION TECHNOLOGY

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Keywords: Classroom approach, Engineering education, Gamification, Immersive learning, Learning tools.

1. Introduction

Interactive learning that involves students actively and cooperatively participating in class activities has been reported to help develop creativity, problem-solving and critical thinking skills, which are among the top ten skills of 2025 as reported in World Economic Forum (2020). Gamification may be the perfect approach to enhance students' learning abilities and skills acquisition through fun and immersive learning experience [1]. In this study, a treasure hunt was designed to assess students' knowledge on certain topics.

2. Methodology

This study was conducted in a Food Preservation Technology course (CBE658) which is an elective course for a 4-year Chemical Engineering program. The course was mostly taught using the incorporation of gamification. Padlet and QR Code were used in a lesson that was designed as a Treasure Hunt.

3. Results & Discussion

Figure 1 shows the students' preference of learning activities based on a survey taken by a total of 157 students at the end of the semester. The gamification approach gained the highest preference with 94%. The second highest was fun quiz (73%), and the third highest was interactive activities using technology (58%) which was not surprising for this mobile-savvy generation. Clearly, only around 20% were motivated by the traditional lecture approach.
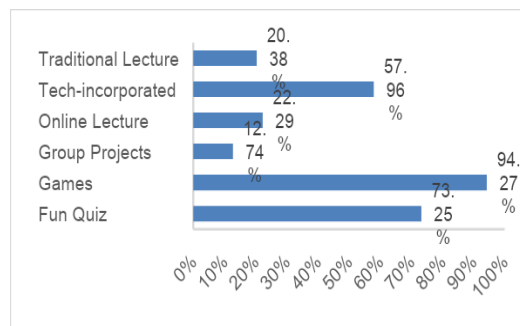
Figure 1. Students' Preferences of Activities

4. Conclusion

Gamification in the classroom creates flexibility of learning and makes the course more interesting for both students and instructors. It seems that gamification has more implied expectations compared to conventional teaching approaches, and students need to be prepared for knowledge acquisition, either in the classroom or online platform.

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ICDF INTEGRATED MODEL IN DEVELOPING ISLAMIC PEERS MENTORING MODULE

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1. Introduction

ICDF Integrated Model is a model for the development of Islamic Peer Mentoring Module (IPMM) in university. It is a combination of the Interpersonal Communication Model (ICM) and Dakwah Fardiyah Model (DFM). The need for a combination of these two models is so evident because ICM emphasizes on the aspects of interpersonal relationships, relationships with oneself and relationships with nature and does not take into account the aspect of relationship with the creator. While the construction of religious personality, which is the main objective of IPMM, takes into account the aspect of relationship with Allah. Thus, the ICDF model that integrates ICM and DFM is very much in line with the module objective.

2. Methodology

The literature review conducted found that ICM and DFM should be integrated in order to produce ICDF Model which is more compliant in Islamic communication by placing the relationship with Allah SWT as the most important element as follows:
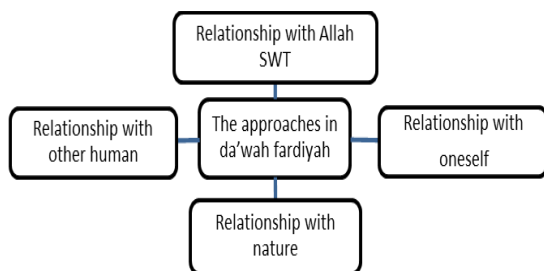
Figure 1. Dakwah Fardiyah Model (DFM)
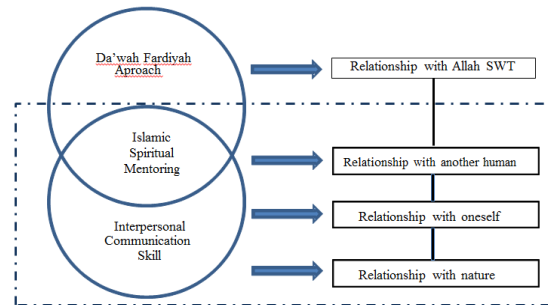
Figure 2. ICDF Model

3. Results & Discussion

The ICDF model, which is more Islamic and shariah–compliant, has been used as the basis for the construction of content and activities for IPPM. This module, which aims to build a religious personality, has succeeded in improving the religious practices and behavior of students, especially in universities.

4. Conclusion

The use of the ICDF model is proven to have a positive effect on personality development. However, further studies need to be done to investigate more about its effects on other elements of Islamic communication.

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MODEL FOR SUSTAINABILITY & MANAGEMENT OF WAQF PROPERTIES IN JOHOR

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1. Introduction

Waqf is considered one of the important financial sources in Islam. Since we are now facing a global Covid-19 pandemic, Waqf is supposedly sufficient to cater to the financial needs of poor people or help them meet their basic needs. However, due to some critical issues encircling the Waqf management, the sustainability of Waqf properties is affected, while interrupting the Waqf purposes and objectives. There are a lot of issues underpinning the sustainability and management of Waqf properties in Johor, which is under the jurisdictions of the Majlis Agama Islam Johor (MAIJ), as no formal guidelines have been initiated yet to identify and overcome the issues.

2. Methodology

This model was developed based on various literature reviews and an interview conducted with an officer from MAIJ.

3. Results & Discussion

Development of waqf properties is the key to a treasure trove left behind by our ancestors in the form of valuable properties possessing enormous potential for future generation's growth and income. However, lack of proper planning and management, insufficient funds, and outdated data are among the issues that have become impediments to waqf development. Therefore, the management of waqf property should be reformed, the policies in waqf institutions should be revived, and the State Islamic Religious Council (SIRC) should be more proactive so that waqf can meet its purpose effectively.

4. Conclusion

All the recommendations are not exhaustive as there is still room for future improvement. It is hoped that this model can be the foundation for a comprehensive solution and potential sources of funding for the more effective and efficient management and sustainability of waqf properties in Johor.

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GAMIFICATION IN PROMOTING THE AWARENESS ON RECYCLING BEHAVIOUR AMONG KINDERGARTEN STUDENTS

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Keywords: Awareness, Gamification, Importance, Recycle, Recycle kit.

1. Introduction

Day by day, the amount of waste has been increasing. This is not only in Malaysia, but also on a global level. According to the Solid Waste Management and Public Cleansing Corporation (SWCorp), in 2018 the national recycling rate was at 0.06%, or about 1,800 tonnes of the 3 million tonnes of waste collected in the period. It shows that the recycling behaviour among households in Malaysia is still relatively poor. Therefore, this Eco-Saviour Kit may help to raise the awareness on the importance of recycling. The Eco-Saviour Kit will be introduced to the kindergarten students.

2. Methodology

The Eco-Saviour kit consists of two things; information on recycling and games. This kit will help students to understand the importance of recycling and they will be able to identify products that can be recycled. Besides, it also introduces the colour coding that has been set in Malaysia. Basically, it is a Do-It-Yourself (D.I.Y) game. It contains 3 bins and all types of waste that can be recycled. Students need to colour it according to the given information. After that, they need to group all the waste according to its type and put it in the appropriate bin.

3. Results & Discussion

Children are the next generation that will become adults and rule the nation in future.

Thus, it is best to target this group and inculcate on the importance of recycling. The introduction of this Eco-Saviour Kit will enable the students to identify the type of waste that can be recycled and how to dispose of it. Besides, they will learn the correct color coding according to the type of waste.

4. Conclusion

It was found that the introduction of Eco-Saviour Kit has helped the students to be aware and understand the process of recycling waste. Having basic knowledge in recycling may help this generation to be more concerned about the planet, thus, increase their passion in protecting it.

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CAMPGAIN– INNOVATIVE LEARNING

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1. Introduction

This innovative program was motivated by the Service Learning Malaysia-University for Society (SULAM), a program that combined community-service and co-learning objectives, highlighting High Impact Learning Practices (HIEPs) approaches that provide space for students to engage with the community. This program is incorporated into the DGM541 course (Fundamentals of Digital Marketing) in UiTM Johor.

2. Methodology

The module ran on six-week consultations with the chosen small-medium enterprise (SME) online. The students shared their knowledge of digital marketing with their chosen SME. Each week, the students assigned a task to the SME and they include situation analysis, marketing plan, customer engagement, and social media marketing. This group of three students chose an SME in Pasir Gudang, Johor to become their business community.

3. Results & Discussion

The program was conducted during Ramadhan 2021. Despite her busy schedule, we are grateful that the chosen SME was very committed and we managed to secure an hour every week for an online discussion. We share tips on how to handle the SME's social media marketing and techniques of creating good content. We also emphasized the importance of doing performance evaluation frequently. This was to ensure that the SME did not make a futile effort. The duration was sufficient for the students to see positive progress with the SME.

4. Conclusion

The chosen SME has confirmed that her customers' engagement has increased since the first week of the program. She has expressed her satisfaction with the program and she will continue to apply the knowledge in the future.

Acknowledgements

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DEVELOPMENT OF LECTURERS' ORGANIZATIONAL CITIZENSHIP BEHAVIORS MEASUREMENT FOR ONLINE LEARNING

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Keywords: Measurement, Organizational Citizenship behavior, Online learning.

1. Introduction

Organizational citizenship behaviors (OCB) are behaviors that contribute to the improvement of organizational, team, and individual performance. Lecturers' OCB which include behaviors such as helpful and hard-working have been found to contribute positively to students' academic performance. Nevertheless, there have been no studies investigating the scope of lecturers' OCB currently involved with online learning. This study aimed to develop a measurement of lecturers' OCB involved with online learning since the outbreak of the Covid-19 pandemic.

2. Methodology

Data were collected by distributing a questionnaire (google form) to undergraduates in one of the branches of a public university in Malaysia. The process for developing instruments for lecturers' OCB in this study was done by adapting an iterative procedure of item generation as suggested by [2].

3. Results & Discussion

Based on the feedback from 136 undergraduates who are currently studying online, we have identified a total of 40 behaviors classified as lecturers' OCB. The findings can help the management of higher learning institutions as well as educators in helping students involved in online learning to improve their academic performance. The results of this study also have the potential to be commercialized in the form of a software used to measure the OCB level of prospective lecturers, especially those who will be involved with online learning.

4. Conclusion

This study provides evidence that OCB also play a very important role in students' online learning. The measurement of lecturers' OCB from this study contributes to the body of knowledge on OCB.

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ECONOMIC ANALYSIS IN THE IMPLEMENTATION OF POLYMER GEL INJECTION TO INCREASE OIL RECOVERY BASED ON GROSS SPLIT CONTRACTS

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1. Introduction
Oil production will decline over time, this is because the majority of reservoirs are mature reservoirs. Enhanced Oil Recovery is a solution to the problem of a reservoir that has decreased production. One part of the EOR technology is polymer gel. Polymer gel injection is a method that has been widely applied in the oil industry. It has been found that polymer gel method helps increase oil recovery. In Indonesia, no one has implemented this EOR method because polymers are quite expensive. Therefore, research on the economics of polymer gel with a gross split production sharing contract needs to be conducted to obtain an economic picture of polymer gel by calculating the economic indicators and profit sharing according to gross split contracts.

2. Methodology
The contract used in this research is Gross split. Gross split contracts provide incentives to contractors who carry out the advanced EOR stage. Based on the addition of the base split for the contractor 43%, variable and progressive splits, the contractor share is 71%.

3. Results & Discussion
By calculating the economic indicator for polymer gel injection with an investment of 2984 US $ M and an oil price of 61.96 US $ / bbl, the calculation results obtained from the researchers are NPV @ 10% = 4,970.89 US $ M, IRR = 168%, POT = 0.4 years, PI = 2.67.

A sensitivity analysis was carried out in this project by changing the assumptions to 85% and 115%. The results obtained show that oil price is a parameter that affects the NPV value followed by oil production, opex, and investment. The tipping point for oil prices occurs when the oil price drops to 62% of the initial project price. Likewise, oil production experienced a tipping point when the production drops to 49% of the total initial production of the project.

4. Conclusion
Based on the study, it can be concluded that the polymer gel injection project is feasible because all indicators meet the feasibility requirements of a project.

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Keywords: Digital marketing, Knowledge transfer, Entrepreneurship, Project-based learning, University-Community.

1. Introduction

This innovative teaching module was designed for the Fundamentals of Digital Marketing course (DGM541) with the integration with Service Learning Malaysia - University for Society (SULAM). This program enabled learners to share knowledge on the effective use of digital marketing (DGM) techniques that they have learned in the classroom with the local business communities (SME). For the business communities, it helps them build sustainable marketing efforts to survive during this difficult time. Thus, this encourages University-Community engagements.

2. Methodology

The module ran for six weeks during the academic semester. The semester began with in-class lectures on the basic knowledge of DGM tools and techniques. In week four, learners began their consultation sessions with the SMEs using a prepared module. The activities consist of analyzing the current condition of the SME's DGM efforts, project timeline, proposed activities of the project, and a performance evaluation at the end of the session. The learners share their knowledge of DGM with the SMEs. The assessment of the module was done through weekly progress reports, final report, presentation, and SME and peer evaluations.

3. Results & Discussion

There were five groups of learners working with five SMEs. They were SMEs involved in food and beverage, fashion and apparel, and a gift shop. We are grateful that our chosen SMEs were very committed and learners managed to have at least an hour a week for online discussions. We received positive feedback from the learners and the SMEs. Learners gained experience on the difficulties faced by the SMEs in managing a business. While, the SMEs appreciate the knowledge shared by the learners.

4. Conclusion

This module enables learning for both learners and SMEs. SMEs were glad to see positive results in their sales and customer engagement. The learners themselves expressed their learning by sharing experiences.

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SUKUK-Gr NEXUS (SGN)

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1. Introduction

Changes in the financial development-economic growth nexus of capital markets have brought some innovations including the introduction of sukuk and Islamic warrants. Such scenarios can change the overall demand, leading to a shift in the demand and supply of capital market products. 'SGN' discovers the effects of sukuk and other capital market sub-components on the economic growth of the world's largest sukuk issuer, Malaysia.

2. Methodology

The empirical investigation was based on the autoregressive distributed lag (ARDL) cointegration bounds test. The data consisted of sukuk (SUKUK), conventional bonds (CB), total conventional bonds and sukuk (CBS), stock market capitalization (SMC) and stock market turnover value (SMTURN).

2.1. Equations

To develop the 'SGN', we extended the following model as suggested by Atje and Jovanovic (1993) and Cooray (2010):

$$\text{Ln}\left[\frac{Y(t)}{L(t)}\right] = a + \frac{\theta}{1-\theta-\sigma-\beta}\text{Ln}(s_K) + \frac{\sigma}{1-\theta-\sigma-\beta}\text{Ln}(s_{HC})$$
$$+ \frac{\beta}{1-\theta-\sigma-\beta}\text{Ln}(s_{SM}) - \frac{\theta+\sigma+\beta}{1-\theta-\sigma-\beta}\text{Ln}(n+g+\delta) + \varepsilon \quad (1)$$

3. Results & Discussion

The results reveal that bond market components have a positive, albeit insignificant influence on economic growth. In contrast, in the long-term, stock market development is shown to have a significant and positive effect.

4. Conclusion

The 'SGN' suggests that sukuk and conventional bonds are not the driving forces of economic growth in the long-term. In contrast, stock market development irrespective of its proxy would be able to foster long-term growth.

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NIAT: THE NEW NORM OF ECONOMICS TEACHING & LEARNING

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Keywords: Economics, Innovation, National income, New norm, Teaching & learning.

1. Introduction
The Movement Control Order (MCO) 1.0, 2.0, and 3.0 require Malaysian higher education students to learn in Online and Distance Learning (ODL) mode. ODL is challenging, especially for subjects that require calculations such as Economics. Thus, NIAT or National Income Accounting Template is the latest innovation which was designed to help tertiary students in understanding difficult subjects like Economics easily during ODL.

2. Methodology
2.1. Materials and methods
NIAT is a Microsoft Excel file with a size as small as 1.17 Megabytes. Therefore, it is easily distributed through chat applications such as Whatsapp and Telegram. Alternatively, it can be shared directly during the ODL process through platforms such as GMeet, Webex, and Zoom. It is divided into six worksheets consisting of:

    i)   User manual
    ii)   Approach 1 – Expenditure
    iii)   Approach 2 – Sector
    iv)   Approach 3 – Income
    v)   Mindmap
    vi)   Video link

To use NIAT, students have to understand the instructions given. Next, they need to identify an appropriate method for the National Income. Once identified, students will filter the values from the question and insert them. NIAT will automatically generate all the key values in the National Income. Later, the students will analyse the values. The mindmap and video link are provided to further facilitate the process.

3. Results & Discussion
Despite its small size, NIAT has assisted many tertiary students in understanding the subject of Economics in detail. This is evident by the results obtained from tests and examinations administered as early as MCO 1.0 in the year 2020.

4. Conclusion
The implementation of ODL is often associated with advanced technologies. However, something simple, practical, and small in size like NIAT is more needed. More importantly, it is valued for its ability to give in-depth understanding of the subject to the students.

Acknowledgements
Thank you to the research team and students for their support.

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MIND MAP: SIMPLE YET SIGNIFICANT!

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1. Introduction
Online and Distance Learning (ODL) is often associated with the most advanced learning platforms such as Google Meet, Cisco Webex, and Zoom. However, different internet access requires something in common. Mind map! A basic learning method that is often used during schooling, but usually abandoned when entering the realm of higher education.

2. Methodology
2.1. Materials and methods
This mind map compacts the entire subject of Economics into one piece of paper. Basically, it is divided according to the topics. Next, graphs, equations and important points are included in it. What differentiates this mind map from others, is that the mind map was developed by the subject's lecturer and not the students. Certainly, the lecturer is the most ideal person in dealing with the subject. This mind map then becomes the basis for the teaching of the subject. In addition, it serves as a guide for students when revising. More importantly, this mind map is the simplest yet significant medium, especially when face-to-face learning sessions cannot be conducted and both teachers and learners mostly rely on virtual learning. The best example is during the Movement Control Order (MCO) phases.

3. Results & Discussion
A total of three mind maps were developed and used in teaching Economics related subjects. Managerial Economics Mind map (MEM) for Managerial Economics subject, SketchMéNomics for Monetary Economics subject, and Sports Economics Mind map (SEM) for Sports Economics subject. The use of these mind maps as early as 2012, especially MEM, successfully helped many students including repeaters in gaining better understanding of the subjects. They also helped students obtain excellent grades, in addition to recording zero failure throughout the period of use.

4. Conclusion
The advancement of technology is not everything. There are times we need to go back to something basic, like the mind map [1]. Most important is an understanding of what is being taught, which lasts forever.

Acknowledgements
Many thanks to the research team members and students for their support.

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A SIMPLE GUIDE TO ACCOUNTING FOR BUSINESS COMBINATION: TEACHING AND LEARNING APPROACH

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Keywords: Business combination, Consolidated financial statement, Financial accounting & reporting, Problem-based learning, Teaching & learning.

1. Introduction

Business Combination (BC) is one of the most comprehensive topics in financial accounting and reporting. The accounting standards issued by the Malaysian Accounting Standards Board (MASB) would be hard especially for beginners to understand the fundamental aspect of BC. Among the critical topics include computation of goodwill, bargain purchase, and consideration transferred. With reference to MFRS 3 *Business Combination*, this project aimed to provide a simple mind map, elaboration and examples using the problem-based learning (PBL) approach based on all topics covered in MFRS 3 *Business Combination*. The tool is named 'GBC…as easy as you combined'. The e-module provided can be used as supplementary materials especially for students taking financial accounting and reporting, particularly related to Business Combination.

2. Methodology

This project is still in the preliminary phases. However, a simple survey was conducted on the perception of students on their acceptance towards the e-module. It was conducted among 15 students taking Advanced Financial Accounting.

3. Results & Discussion

The finding indicates that students were able to grasp the fundamental concept of Business Combination. The approach of mind mapping provides the whole picture of the topics. Simple elaboration and examples were also useful for students in understanding the accounting treatment. The module provides simple elaboration and the computation stimulates a fun and enjoyable atmosphere especially for this so-called difficult topic.

4. Conclusion

In conclusion, students usually like to read a simple elaboration especially related to comprehensive standards such as MFRS 3 *Business Combination*. The approach of PBL accompanied by simple modules and tools can enhance student's understanding.

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COMMERCIALIZING PRODUCTS THROUGH ECOTOURISM PROJECTS, Et CETERA: CpTOURS

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Keywords: Commercialization, Innovation, Malaysia.

1. Introduction

There are many innovations and inventions left dry without being able to move forward and commercialize, what more bringing in money. This scenario has caused great setbacks, financial depletion, and motivation apathy amongst researchers. Researchers have not yet fully accepted the commercialization aspect as a norm [1], with many institutions struggling in finding ways to get back the return on the investment made. CpTourS is a strategic framework designed to identify and assist potential innovations and inventions to achieve the commercialization status. CpTourS has been proven to help many products achieve the commercialization stage and return on investment.

2. Methodology

CpTourS is created based on the researchers' own experiences dealing with the innovation and invention process. The identification of elements in CpTourS were tested onto several products. CpTours has also considered the Schumpeter's Theory of Innovation [2], a trilogy of invention, innovation, and diffusion.

3. Results & Discussion

CpTours provided a personalized package for selected products to be sustainably commercialized. CpTours has helped produce income for clients through commercialization as shown in Table 1. The commercialization achievement value ranges from RM20,000 to RM1,498,500. Each product went through a thorough CpTours process.

Table 1. Commercialization with CpTourS

Product Name	Year	Value (RM)	Buyer of Product
Reef	2016	30,000	Industry
DBPRO	2017	40,000	Sarawak Gov.
3S	2017	50,000	Malaysia Gov.
USFF	2018	20,000	Industry
USFF	2020	50,000	Malaysia Gov.
USFF	2020	115,000	Industry
FCF	2018	130,000	Malaysia Gov.
FCF	2018	20,000	Industry
FCF	2020	461,000	Industry
FCF	2021	1,498,500	Sarawak Agency
5 products	Total	2,414,500	11 buyers

4. Conclusion

There are many more potential products that have successfully reached the commercialization stage and assisted in how to achieve market sustainability using CpTours. CpTourS has the eye and brain to bring in monetary gain.

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SME AND MICROENTERPRISE RISK PROFILING TOOL

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Keywords: Risk management, Small & medium enterprises, Risk index, Risk profil.

1. Introduction

Risk Management (RM) is a very relevant process that can be related to enterprises' performance [1]. The strategic plan of the enterprises is frequently implemented by tackling projects, so project risk management (PRM) has arisen as a very important approach [2]. Taking into account that SMEs make a very relevant contribution to the economy [3]; the analysis and the understanding of the key processes of PRM in SMEs is a relevant and pressing question, and the guidelines and tools used by large firms are usually too expensive or too complex to be suitable for SMEs. Therefore, a specific risk profiling tool i.e. *RisksMax©* is needed to manage risk exposures of SMEs and microenterprises.

2. Methodology

RisksMax© was the outcome of a study which employed a quantitative analysis using partial least squares structural equation modelling (PLS-SEM) in a second-order factor structure in order to examine the hierarchical models. The total population of the public listed companies was stratified into two categories i.e. industry and location to which they belong to. Following a systematic random selection procedure, a total sample of 469 was proportionately compiled in which 164 usable responses were received.

3. Results & Discussion

The results show that structural paths leading from the predictor (entrepreneurial orientation) to the criterion (performance) was significant, with moderate magnitude and moderate effect size ($\beta = 0.28$, $p < 0.001$, $f2 = 0.12$). Hence, risk management which is the dimension of entrepreneurial orientation does affect performance of enterprises.

4. Conclusion

The novelty of *RisksMax©* resides in its elegance and underlying benefits. It is designed to capture, calculate and evaluate a large volume of complex risk data and reduce them to a single number. This calculation is applied in a customized manner to address the unique business strategies and risks within each individual enterprise.

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