# PROGRAMME & ABSTRACT BOOK

## INTERNATIONAL INVENTION & INNOVATIVE COMPETITION (InIIC) Series 1/2021

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# 2021

# INTERNATIONAL INVENTION & INNOVATIVE COMPETITION (InIIC)

## *SERIES 1/2021*

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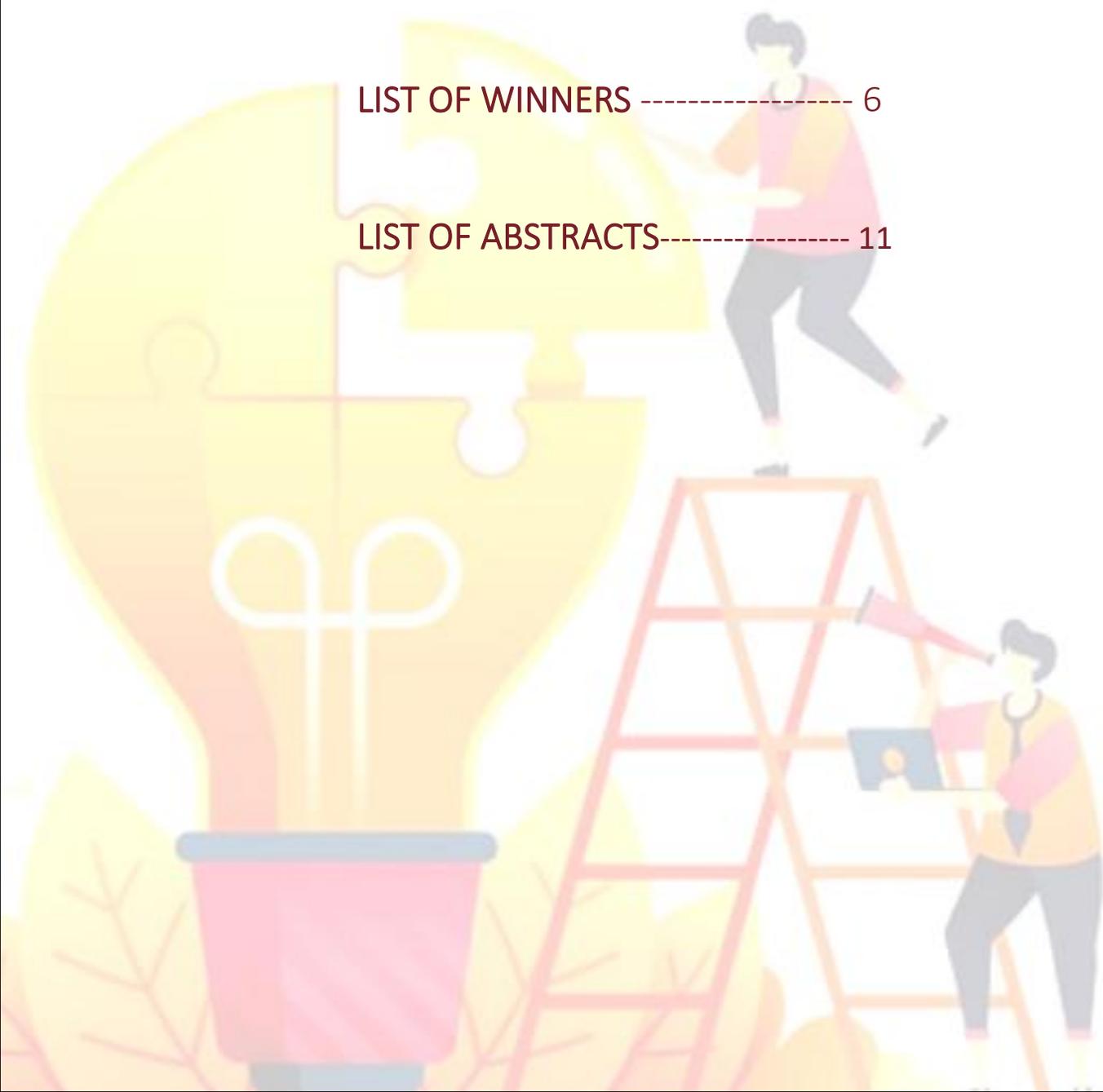
# DIRECTOR MESSAGE

*Greetings!*

I would like to express my gratitude to all participants for participating in International Invention and Innovative Competition (InIIC), Series 1/2021.

Thanks to the successes achieved over the past series, InIIC has become a brand for the brightest and creative minds of youngsters and professionals to present their innovative ideas. We believe InIIC has significantly contributed to spread the culture of innovation in various fields of knowledge and expertise. This has not been possible without the commitment and creativity of the participants. Therefore, I would like to thank all InIIC participants since 2016 that have contributed to achieving the goals of InIIC along this journey. My sincere thanks are also to our partners and sponsors.

Malaysia is currently under a strict lockdown as Covid-19 hit the highest record. Other countries also facing challenging environments dealing with the pandemic. But despite that, I was amazed by all innovators who put an effort and strong determination to submit the materials by the deadlines, while staying at home. You just prove that you are the real innovators.

This first InIIC series in 2021 participated by 71 teams from Malaysia, Indonesia, Thailand and Philippines. Each project was evaluated by two expert juries from their fields. 50 marks are the allocation for the innovation,  while 16 and 24 marks fall under others (intellectual property, award, etc) and presentation (video and poster) respectively.  Thank you to 30 juries who were very committed to ensuring the results were released as scheduled.

Congratulations to all the winners! Wishing you more success in the future. We look forward to serving you again. Stay safe, stay at home.

*'Research & Design in Challenging Environment'*

Warm Regards,
Nadzri Salleh

# LIST OF JURIES

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**Dr. Kang Chia Chao**

Xiamen University Malaysia

**Ts. Sr Dr. Nadzirah Hj. Zainordin**

UCSI University

**Quah Wei Boon**

Sungai Petani Community College

**Ts. Nur Syafinaz Mohd Anuar**

UiTM Kelantan

**Ts. Mohd Zamani Daud**

UiTM Kelantan

**Dr. Fu Sai Hoe**

Pejabat Pendidikan Daerah Sandakan

**Assoc. Prof. Dr. Maegala Nallapan
Maniyam**

Universiti Selangor

**Muhamad Azlin Bin Ismail**

Kolej Komuniti Bagan Datuk

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**Dr. Mohd Zaki Bin Mohd Yusoff**

UiTM Pulau Pinang

**Dr. Nur Nadia Dzulkifli**

UiTM Negeri Sembilan

**Saiful Bin Mohamed Shuib**

Politeknik Tuanku Syed Sirajuddin

**Dr. Norhafizah Binti Ismail**

Politeknik Mersing

**Dr. Afifah Shuhada Binti Rosmi**

Universiti Malaysia Perlis

**Ts. Dr. Kumuthawathe Ananda-Rao**

Universiti Malaysia Perlis

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Universiti Tun Hussein Onn Malaysia

**Aishah Binti Saim**

Politeknik Banting Selangor

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**Jouvan Chandra Pratama Putra**

Bakrie University, Jakarta

**Razif Bin Dasiman**

Universiti Teknologi Mara

**Siti Rahimah Binti Rosseli**

UiTM Pulau Pinang

**Ts. Dr. Shelena Soosay Nathan**

Universiti Tun Hussein Onn

**Hazlina Mohd Padil**

UiTM Negeri Sembilan

**Prof. Ts. Dr. Palsan Sannasi Abdullah**

Universiti Malaysia Kelantan

**Dr. Noor Hasimah Ibrahim Teo**

Universiti Teknologi MARA

**Dr. Yusmi Bin Mohd Yunus**

Universiti Selangor

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**Karmila Rafiqah Binti Mohd Rafiq Anbarasan**

Universiti Kebangsaan Malaysia

**Ts. Dr. Nor Nadiah Abdul Karim Shah**

Universiti Putra Malaysia

**Ahmad Adnan Bin Mohd Shukri**

University of Science, Malaysia

**Ts. Dr. Mohd Salahuddin Bin Mohd Basri**

Universiti Putra Malaysia

**Dr. Hazeeq Hazwan Bin Azman**

Universiti Selangor

**Dr. Chee Ken Nee**

Universiti Pendidikan Sultan Idris

# LIST OF WINNERS

## OUTSTANDING AWARD

REF NO. 1673:
**A PROFILING SYSTEM FOR TALENT MANAGEMENT IN HIGHER EDUCATION INSTITUTIONS: UNILEAD**
AKADEMI KEPIMPINAN PENDIDIKAN TINGGI
*Ismie Roha Mohamed Jais, Azian Mohmad Azman, Erlane K Ghani, Ahmad Shakirin Zainal Abidin & Hanis Maisarah Abu Bakar*

## DIAMOND AWARD

### Category A
Ref No. 1666
**KENAF-SORB: CYCLIC ADSORPTION OF LEAD IONS FROM AQUEOUS SOLUTION**
UNIVERSITI TEKNOLOGI MARA (UiTM)
*Ts. Dr. Nurul Fariha Lokman, Nurul Ain Shafiqah Anuar, Prof. Sr. Ir. Dr. Suhaimi Abdul-Talib, Assoc. Prof. Dr. Tay Chia-Chay & Prof. Ir. Dr. Ahmad Ashrif Abu-Bakar*

### Category B
Ref. No. 1740
**M-HEUTAGOGY: PROMOTING LEARNER AUTONOMY IN PREPARATION FOR THE FOURTH INDUSTRIAL REVOLUTION CHALLENGES**
UNIVERSITI PENDIDIKAN SULTAN IDRIS
*Analisa Hamdan, Assoc. Prof. Ts. Dr. Wong Kung Teck & Dr. Nor Syazwani Mat Salleh*

### Category C
Ref. No. 1677
**THE NEW DESIGN OF RECTIFIER AND ELECTRIC BOOSTER TO SUPPORT MICRO ENERGY HARVESTING DEVICE**
MTs NEGERI 1 KOTA MALANG
*Teguh Dewangga S.Pd (Advisor), Aqila Razzan Setyovianto, Fairuz Daffa Al Hazza, Salwa Dilara Nandra Husada & Farsya Fahira Islami*

## Category A1: Professional Social Sciences

| REF # | PROJECT TITLE | INSTITUTION | AWARD |
|---|---|---|---|
| 1687 | The Perfect 10 - Travel Kit Exclusive | Faculty of Hotel & Tourism Management UiTM Cawangan Terengganu Kampus Dungun | GOLD |
| 1672 | Mobile Application of Historical Information for Heritage Sustainability | UiTM Cawangan Kelantan | GOLD |
| 1690 | Intelligent Taxpayers (iTax) | Universiti Teknologi MARA (Cawangan Terengganu) | GOLD |
| 1691 | Fun & Learn 3R: A Playbook for Pre-school Kids V2.0 | Universiti Teknologi MARA | SILVER |
| 1729 | Multiple-eMath | Universiti Teknologi MARA Sarawak | SILVER |
| 1718 | Kaji English for Year 4 | Universiti Utara Malaysia | SILVER |
| 1692 | Solid Waste Management Hierarchy of Households in Malaysia | Department of Built Environment Studies & Technology Universiti Teknologi MARA , Perak Branch Seri Iskandar Campus, Perak | SILVER |
| 1702 | Framework of Shariah Compliance 5S Quality Management in Developing Policy for Achieving Sustainable Green Campus | Islamic Business School, Universiti Utara Malaysia | BRONZE |
| 1745 | Note-in-Poster Framework | Universiti Teknologi MARA Cawangan Negeri Sembilan | BRONZE |
| 1738 | Student Industrial Attachment during Pandemic Era: An Implementation Framework for Universities | Faculty of Information Management, Universiti Teknologi MARA Selangor Branch, Puncak Perdana Campus | BRONZE |

## Category A2: Professional Science, Engineering & Technology

| REF # | PROJECT TITLE | INSTITUTION | AWARD |
|---|---|---|---|
| 1733 | CSBPcrete | UiTM Caw. Johor Kampus Pasir Gudang | GOLD |
| 1669 | Development of SMART MyAgriShop Web Application for COVID-19 | Universiti Malaysia Sabah | GOLD |
| 1696 | Penyu Kita the Turtle Awareness Mobile Apps | University College TATI (UC TATI) | SILVER |
| 1685 | UMS Location-based Augmented Reality Tour Mobile Application | Universiti Malaysia Sabah | SILVER |
| 1735 | ULAMs: University Location Attendance Management System | Universiti Putra Malaysia | BRONZE |
| 1686 | CHATBOT: Virtual Counsellor Using Speech Emotion Recognition System | Universiti Malaysia Sabah | BRONZE |

## Category B1: Higher Institution Students (Social Sciences)

| REF # | PROJECT TITLE | INSTITUTION | AWARD |
|---|---|---|---|
| 1688 | Easy Carry Easy Display (E.C.E.D) 2.0 | University College of Technology Sarawak | GOLD |
| 1744 | ProM3 Rubric and Task: Assessment of Students' Mathematical Process Skills | Universiti Pendidikan Sultan Idris | GOLD |
| 1739 | EzMathz | Universiti Pendidikan Sultan Idris | SILVER |
| 1737 | Grit To Great: Development of A Model To Enhance Students' Oral Presentation Performance | Universiti Teknologi MARA | SILVER |
| 1667 | Operation Wheel | Keningau Vocational College | BRONZE |

# Category B2: Higher Institution Students
## (Science, Engineering & Technology)

| REF # | PROJECT TITLE | INSTITUTION | AWARD |
|---|---|---|---|
| 1674 | Combining Ru-PIP and Olaparib: A New Promising Strategy to Combat Cancer | UPM-MAKNA Cancer Research Laboratory, Institute of Bioscience, Universiti Putra Malaysia | GOLD |
| 1714 | Caventure as Innovative Cave-Based Tourism and Education Platform Towards Society 5.0 in Yogyakarta | Yogyakarta State University | GOLD |
| 1701 | Autonomous Grease Trap Maintenance System Based on Internet of Things (IoT) | Imperium International College | GOLD |
| 1736 | Project-Based Learning in Architectural Design 6: Applications of Connectivism | Mapua University | GOLD |
| 1703 | FISHGAS: Environmentally Friendly Fish Waste Biogas as an Alternative to LPG Fuel | Brawijaya University | GOLD |
| 1681 | Future Electric Vehicle Charging Stations Based Power Factor Correction Integrated Vienna Rectifier | Taylor's University | GOLD |
| 1697 | Development of Gamification in Tourist Guide Application | Universiti Malaysia Sabah | GOLD |
| 1670 | SMART Autistika: Mobile Game Application with Chatbot for the Learning of Autistic Children. | Universiti Malaysia Sabah | SILVER |
| 1728 | Your One Stop Salon-tion meet Haira Chatbot | Asia Pacific University of Innovation and Technology (APU) | SILVER |
| 1680 | Decision Support Tools for Sustainable Land Allocation and Utilisation of Oil Palm Plantations | Taylor's University | SILVER |
| 1705 | Innovative Smart Riding Sensor for Safety Enhancement | Asia Institute of Technology and Business | SILVER |
| 1679 | Sustainable and Flexible Photovoltaic Module with Novel Palm Oil Fibre Bio-Composite Backsheet Material | Taylor's University | SILVER |
| 1698 | The Use of Piezoelectric Energy Harvester in Speedbump with Passing Vehicle to Generate Clean Energy | Imperium International College | SILVER |
| 1723 | BAKULIS: Airspray Solution from Jeruk Limau Peel Waste (Citrus amblycarpa) and Lemongrass (Cymbopogon citratus) as Natural Larvicide in Preventing Dengue Hemorrhagic Fever | Universitas Andalas | SILVER |
| 1694 | Android Application for Measuring 21st Century Skills' Junior High School Students using Virtual Laboratory | Indonesia University of Education | SILVER |
| 1713 | THINDER (Things Finder) | Indonesia University of Education | BRONZE |
| 1706 | "HSSbuzz" Automatic Hand Sanitizer Spray with Buzzer & Human Sensor | Institut Teknologi dan Bisnis Asia | BRONZE |
| 1704 | Smart Intergrated Assistant for Anxiety and Panic Attack (S.I.A.P.A) Watch | Institut Teknologi dan Bisnis Asia | BRONZE |
| 1727 | Utilizing Servers To Create a PVE Environment | Asia Pacific University of Technology & Innovation (APU) | BRONZE |
| 1700 | Low Cost 3D Printed PLA Robotic Arm Prosthesis using Snap-on Joints | Imperium International College | BRONZE |
| 1668 | Smart Skool | Keningau Vocational College | BRONZE |
| 1699 | Automatic Fish Feeder and Cleaning Notification Tool | Indonesia University of Education | BRONZE |

# Category C: School Students

| REF # | PROJECT TITLE | INSTITUTION | AWARD |
|---|---|---|---|
| 1678 | Inpestor 1.0 (Innovative Pest Attractor) to Increase Productivity of Tobacco as Superior Commodity in Southeast Asia | MTs Negeri 1 Kota Malang | **GOLD** |
| 1715 | ARIES - A Concept To Be A Solution for Global Warming, Energy Saving and AC Filter Efficiency | Sekolah Menegah Kebangsan Kulim | **GOLD** |
| 1682 | Snake Fruit Peel Chips As A Healthy Food in Efforts To Reduce Blood Glucose Levels in Sufferers Diabetes | Sunan Pandanaran Islamic Junior High School | **GOLD** |
| 1725 | SPIKESAW | Sekolah Menengah Sains Johor | **GOLD** |
| 1683 | Jamaican Cherry and Ginger Tea as A Healthy Drink in An Effort To Increase Immunity During The Coronavirus Disease (COVID-19) Pandemic | Sunan Pandanaran Islamic Junior High School | **GOLD** |
| 1707 | The Miracle Tray | SJKC Chukai Kemaman | **GOLD** |
| 1708 | Eco Mulch Matt | SJKC Chukai Kemaman | **GOLD** |
| 1732 | Q-FITPACK | SM SAINS JOHOR | **GOLD** |
| 1722 | Formulation of Cassava Leaves (Manihot Esculenta) Substituted Onion (Eleutherine Bulbosa) in Candy Jelly for Improving Fiber and Antioxidant Immune System | MAN 2 Kebumen / Indonesia Scientific Society | **SILVER** |
| 1709 | Easy Waterproof Shoes Cover | SJKC Chukai Kemaman | **SILVER** |
| 1710 | Mic Mop | SJKC Chukai Kemaman | **SILVER** |
| 1734 | BrellaBag | Sekolah Menengah Sains Johor | **SILVER** |
| 1676 | HOPS : Highway Operator Shortcut | Singapore International School of Bangkok (Thonburi Campus) | **SILVER** |
| 1726 | Wholle Scooter | Sekolah Menengah Sains Johor | **SILVER** |
| 1721 | Optimization of Bio-Oil and Biochar from Pyrolysis of Upakara Waste as Energy | SMA Bali Mandara / Indonesia Scientific Society | **SILVER** |
| 1693 | Eco Friendly Sound Proofing from Organic and Inorganic Waste: Our 3R Project | Lab school Elementary School | **SILVER** |
| 1720 | APD (Automated Pes Detection) Helps To Increase The Agriculture Result of Farmers | MA PPMI Assalaam / Indonesia Scientific Society | **SILVER** |
| 1695 | Vallavan Herbal Hand Sanizer | Sekolah Jenis Kebangsaan Tamil Jenjarom | **BRONZE** |
| 1712 | Bilingual Covid-19 Interactive Information via Android Application: An Alternative Easy User Interactive Tool for Raising Public Awareness and Comprehend of Covid-19 | SMAIT Pondok Pesantren Terpadu Almultazam | **BRONZE** |
| 1730 | AP-bag | Sekolah Menengah Sains Johor | **BRONZE** |
| 1741 | Let's Play Dam Gramm | SJKT Air Kuning Selatan, Gemencheh, Negeri Sembilan | **BRONZE** |
| 1719 | Light-Maze | SMK Sultan Badlishah | **BRONZE** |
| 1724 | HSP (Hydroponic Solar Pump), An Innovative Use of Leftover Food as Fish Feed By Utilizing Renewable Energy Sources | MA PPMI ASSALAAM / Indonesia Scientific Society | **BRONZE** |
| 1731 | Smart Holder | Sekolah Menengah Sains Johor | **BRONZE** |

# LIST OF ABSTRACTS

## Kenaf-sorb: Cyclic Adsorption of Lead Ions from Aqueous Solution

Ts. Dr. Nurul Fariha Lokman, Nurul Ain Shafiqah Anuar, Prof. Sr. Ir. Dr. Suhaimi Abdul-Talib, Prof. Madya Dr. Tay Chia-Chay & Prof. Ir. Dr. Ahmad Ashrif Abu-Bakar

Universiti Teknologi MARA (UiTM)

*Abstract -* This study aimed to determine plant-based kenaf adsorbent on the adsorption of polluted heavy metals in aqueous solutions. CHT and KNF core powders were added in a sodium alginate solution and stirred homogeneously. The blended solution was dripped into calcium chloride to form smooth magnetic KNF-CHT-ALG beads. The surface morphology, functional group present in the beads and percentage removal of heavy metals were determined using the FESEM, FTIR and ICP analyses, respectively. The surface morphology of kenaf core was rougher than kenaf fibre, with the larger amounts of micropores, as observed in the FESEM analysis. In addition, FTIR pattern of the beads confirmed the existence of functional groups, such as hydroxyl and carboxyl, which could attract more positively charged heavy metals. Furthermore, ICP analysis confirmed the success of 95% adsorption of heavy metals up to 5 cyclic numbers. The kenaf is a crop found in abundance in Malaysia, that had the potential to reduce the production cost of adsorbents. The significant outcomes would minimise the dependency on chemical adsorbents and accelerate the removal process of heavy metals in real water bodies.

Keywords: kenaf; polluted; adsorbent; adsorption; heavy metals

## Operation Wheel

Nur A'Dilah Farhanah Binti Abdullah, Alvira Doloris, Aldiedianie Alexander, Jellysia Joen Jimson, Nurul Syakira Binti Mohd Shazwan & Elmey Azleyza Ain Binti Norsaleh

Keningau Vocational College

*Abstract -* In a world where people including children spend more time on screen than interacting with tangible objects and physical environment, teaching certain skills like mathematics to children is becoming more challenging. Operation Wheel is a teaching aid that was developed to train children to master basic numeracy skills. This tool was designed for children aged 5-6 and the purpose is to offer them a hands-on learning experience that enables children to learn abstract concepts through physical representations. The target groups are preschool and kindergarten teachers as well as parents since this teaching aid can be safely and easily used in any setting.

# Smart Skool

Nadhirah Reha Awang, Siti Nur Syairah Bt. Jeffry, Brenda Veralyn Baling, Jaclyn Junsin, Nurul Ain Sarah Binti Mohd Ariffin & Ollevia Leovie

Keningau Vocational College

*Abstract -* Due to the increasing awareness on health risks of contagious diseases that COVID 19 pandemic has brought upon as, coupled, with the omnipotence of information accessible on the internet, every community needs of its localized and tailored platform to access information in a more convenient, safer and systematic manner. Thus, we plan to develop a mobile app that enables people to stay updated with the latest updates particularly on issues that concern them such as COVID 19 cases in their area, online opportunities on competitions, grant applications and conferences, commercial platforms for them to sell or purchase products or services. There are several features that this project aims to provide its customer: credible sources of information, precautions and warnings against scam and the capacity to share and exchange information among the users. Our target customers are school students who often rely on mobile devices to stay abreast on current issues and updates of their personal interests. It is free for download and many features of this app can be used without any charge. However, there will be minimal charge if the users require further assistance such as on proofreading of their applications for any opportunities, additional mentoring from experts and requests for publicity on businesses and offers.

# Development of SMART MyAgriShop Web Application for COVID-19

Aslina Baharum, Siti Hasnah Tanalol, Nur Shahida Ab Fatah, Farhana Diana Deris & Noorsidi Aizuddin Mat Noor

Universiti Malaysia Sabah

*Abstract -* Kundasang farmer had difficulty finding suitable transport for deliveries because many truck drivers are unable to pick the fruits and vegetables from Kundasang collecting center as a result of quarantine measures. Sabah government has been urged to immediately resolve the problem of vegetable dumping in Kundasang since MCO implemented. Many traders lacked support systems in delivering their agriculture product to the end user, and were unable to properly predict the volume of orders for agriculture products. Another issue in the agricultural supply chain in Kundasang including the uncertainty of the market demand.MyAgriShop is a platform where people can buy the vegetables and fruits from Kundasang, Sabah through online platform and been delivered to their doorstep. Other than that, this mobile application can be also use for the farmer/supplier to sell their products and manage their yearly earning. Last but not least, runner role also available for this application so that the order will be delivered to our beloved customer at their doorstep.

# SMART Autistika: Mobile Game Application with Chatbot for the Learning of Autistic Children

Musa Mohd Rofei, Aslina Baharum, Nadiah Hanin Nazlan, Farhana Diana Deris, Ismassabah Ismail & Noorsidi Aizuddin Mat Noor

Universiti Malaysia Sabah

*Abstract* - The design of applications tailored to each user's capabilities is an important modern software engineering task. Children with spectrum disorder and intellectual disability are specific users where the traditional application design is not a successful solution. Today's estimates indicate that more than a billion people, including children, have specific disabilities. This negative phenomenon contributes and needs to overcome some of the limitations of both patient's and their families' lives. New technology and interactive resources are an excellent way to help young children's cognitive psychological, mental, physical, and linguistic development. About 50% of children with autism display deterioration in their current growth and have difficulties with all language forms due to impaired communication. Also, since they do not have verbal and nonverbal communication skills, contact and communication with Autistic children are difficult. Proper teaching techniques are one of the alternatives to help students learn. If teaching techniques match the student's choice style, the learning process will become more accessible, natural, and the learning time will also be reduced. The autism learning process can also be improved using visual support because they have higher visual capabilities than normal children. Therefore, by using the right teaching techniques and learning the style of Autism, children can improve their skills and knowledge. Combining multimedia elements in mobile applications can help Autism enhance its learning skills. This study focuses on developing Autism children's game applications with that chatbot using AI technology against Autism children characterized by low-level Autism. This study focuses on how Autistic children can focus on learning using visuals or games. That chatbot will also help teachers solve problems related to Autism; this is because the chatbots have been trained to answer some things associated with Autism children and the types of therapies available today. As a result, children can improve their social aptitudes and keep up associations with the AI-based device. Kids with Autism feel more comfortable and open with AI and robots than other people because when it comes to emotional communication, robots are less complicated than humans and are somewhat similar to toys for them. For autistic children, technological advancements such as artificial intelligence play an important role in enhancing their capabilities and learning how to interact with others and reach them to their maximum potential in a comfortable way.

## Mobile Application of Historical Information for Heritage Sustainability

Nurulannisa Abdullah, Faizal Haini Fadzil, Izzatil Husna Arshad, Noor Arina Md Arifin, Siti Aishah Mokhtar & Huda Hamidon

UiTM Cawangan Kelantan

*Abstract -* As oral history collections preserve memories and personal commentaries of historical significance through recorded interviews, it also preserves the unrecorded and generally unfamiliar memories of the past as evidence of history. To be preserved properly, the collections need special housing and management. The number of mobile users today is greater than the number of desktop users. The objectives of this mobile application are to preserve the collections of oral history and to support the research and national heritage needs in Malaysia, to organize, access, and share information because no one really knows how many collections are exist or what condition they are in. Current technology could be of great help to be utilized the access to the students, researchers, and professionals who rely on easy access to the national history collections. These collections provide audio and/or video recordings and transcription. Researchers will gain knowledge of oral history methodology, planning, and evaluation through the use of these resources. This project covered the importance of digital preservation, the background of the collections and the relevance of the collections towards heritage sustainability which provides accessibility functions as what a digital repository would do. This mobile apps are significantly straightforward. It supplies users with the transcription collections and information they are looking for in an easy-to-understand layout that efficiently navigates them to the things they want to see. Furthermore, they can also identify location of the users in real-time to provide geography-specific content.

## HOPS : Highway Operator Shortcut

Che Banchasuek, Jirayu Soontaranont, Zhang Lu Zhe & Narudee Udomrungruang

Singapore International School of Bangkok (Thonburi Campus)

*Abstract -* As you know, that Thailand is one of the worst traffic jam in the world. And why we have so many traffic? That because most people will avoid traffic in the normal lanes and use the highway instant. Then the traffic in the highway comes. Most of same cause from car broke, car crash. Some emergency cars need long time to get off the highway. Is anyway to solve our quest？ HOPS has a lift connected to the highway and the station on the ground. The lift will transport the problem car down to the station. Once the problem car is lifted down to the ground. There will be the service station installed to help such as the first aid service to help injured patient and the car to be fixed.

# A Profiling System for Talent Management in Higher Education Institutions: UNILEAD

1Ismie Roha Mohamed Jais, Azian Mohmad Azman, 2Erlane K Ghani, 1Ahmad Shakirin Zainal Abidin, 1Hanis Maisarah Abu Bakar

1Akademi Kepimpinan Pendidikan Tinggi, Malaysia
2Faculty of Accountancy, Universiti Teknologi MARA, Selangor, Malaysia

*Abstract* - Akademi Kepimpinan Pendidikan Tinggi (AKEPT) has been actively involved in Leadership Talent Management for Higher Education Institutions in Malaysia. Such involvement is aligned with the aspiration of the Malaysia Education Blueprint (Higher Education) 2015-2025 that clearly states the need to build competent leaders towards talent excellence. To ensure leadership excellence in the higher education institutions, it is important for AKEPT to create initiatives that can gauge leadership competency gaps of potential talents in order to execute a more strategic leadership development plan for effective and efficient talent management. Following this, 494 academics from 20 public universities, polytechnics and other related higher education agencies have been profiled through the AKEPT Leadership Assessment Centre. To accommodate this profiling data, a reliable and systematic execute framework is crucial for AKEPT in order to move this critical agenda which eventually sustains organisation culture of excellence. Subsequently, AKEPT has created UNILEAD. UNILEAD is a system that being developed to accommodate AKEPT with strings of options for them to manage and keeping records of potential talents that have gone through AKEPT's psychometric test, Behavioural Event Interview (BEI) and Strategic Plan Presentation (SPP) approaches. UNILEAD was developed using PHP and MySQl as the database. With the use of jQuery and Bootstrap as the framework, UNILEAD accommodates current device for viewing and managing the content. At present, UNILEAD is hosted locally in AKEPT, with two servers operating as Main server and Backup Server (system and database) of which the backup will be done automatically every day at 4.00 AM.

Keywords: Leadership, Talent Management, Academics, Higher Education Institutions, Malaysia

# Combining Ru-PIP and Olaparib: A New Promising Strategy to Combat Cancer

Nur Aininie Yusoh, Haslina Ahmad & Suet Lin Chia

UPM-MAKNA Cancer Research Laboratory, Institute of Bioscience, Universiti Putra Malaysia

*Abstract -* Cancer remains a burden on society as well as on the economy in Malaysia due to the high mortality and morbidity. For example, in 2018, Asia accounts for 48.4% of total cancer cases and 57.3% of total cancer-related death in the world. Currently, chemotherapy remains the most common treatment for cancer. However, single-drug treatment may lead to insufficient tumor suppression, intolerable side effects and rapid emergence of drug resistance. In addition, it requires high-dose and is clinically limited to certain form of cancers. Thus, the development of novel drug candidates and their incorporation in new rational combination strategies with existing treatments remain highly desirable. The present innovation relates to the new promising strategies of combining ruthenium complexes Ru-PIP with Olaparib to effectively combat cancer. This drug-drug combination work is significant and distinct from other related combination studies with the use of novel and emerging ruthenium anti-cancer candidates of Ru-PIP, a DNA intercalator that was developed by our group. This strategy takes advantage to the fact that Olaparib inhibits the key DNA repair enzymes of PARP and thus, is an ideal synergistic pairing to Ru-PIP which, upon addition to cells, immediately generates cellular DNA replication stress. This work is represented by the evaluation of the said combination in in vitro cell models. We found that Ru-PIP/Olaparib combination inhibits the proliferation of cancer cells through enhanced DNA damages which led to the induction of cell cycle arrest and ultimately, apoptotic cell death. Most importantly, Ru-PIP/Olaparib combination had minimal impact on normal healthy cells. These findings provide evidence of significant superiority of Ru-PIP/Olaparib combination treatment compared to single-agent conditions with significantly lower doses of individual agents are required. Thus, this can address the challenges of systemic toxicities, severe adverse effects and drug resistance in cancer treatment to ultimately prolong patient's survival. The fact that Olaparib is an FDA-approved drug make this newly identified combination clinically translatable. As such, the implementation of this improved cancer treatment will significantly reduce the national economic burdens of cancer. Societal impact of this work is the improved treatment option available for cancer patients as survival is their top priority upon diagnosis. This research approach also appeals to many communities including medicinal inorganic chemist, oncologist and pharmacologist. This will help to bridge these diverse scientific disciplines leading to the greatest possible impact on cancer research.

# The New Design of Rectifier and Electric Booster to Support Micro Energy Harvesting Device

Aqila Razzan Setyovianto, Fairuz Daffa Al Hazza, Salwa Dilara Nandra Husada & Farsya Fahira Islami

MTs Negeri 1 Kota Malang

*Abstract -* Micro energy harvesting devices have been developing recently to optimizes potential energy sources around the environment. However, power output from these micro energy harvesting devices is remaining limited, therefore it needs to be improved. The problem statement in this innovation is which kind of circuit that works optimally to support micro energy harvesting devices. Based on that problem, the objective of this project is to find out the best circuit which can work optimally and increase electrical energy that uses AC voltage input (A) variations, consists of 1V (A1), 2V (A2), 3V (A3), 4V (A4), and the capacitance value variations (B), of 1000 µF (B1), 2000 µF (B2), 3000 µF (B3), 4000 µF (B4), 5000 µF (B5), 6000 µF (B6), 7000 µF (B7), 8000 µF (B8), 9000 µF (B9), 10000 µF (B10). This invention used Multisim and Livewire simulation software for testing the voltage, electric current, electric power, and increasing voltage per second. Based on the test result, the best sample is A4B10 using an input voltage of 4 AC V and a capacitance value of 10000µF, can generated voltage (Volt) of 19.91 DC V, electric current (mA) 66.73 mA, power (Watt) 1.3286 W and increasing voltage per second of 1.301 V/s. Therefore, this circuit can increase the output power up to 5 times, this amount is higher than the previous inventions that able to increase the input voltage up to 2 times only. The novelties of this invention are easy to assemble, work efficiently, and optimally to support a micro energy harvesting device's system. This invention can potentially be patented through electrical circuit design and innovation system design. In addition, the price of the invention is affordable only around $15.64 which can widely apply and support micro energy harvesting devices. Therefore, this innovation can give benefit society by having an electric multiplier that more affordable, it can provide green energy from which is safe for the environment.

Keywords: Electric Multiplier, Energy Harvesting Device, Electrical Energy, Capacitance Value

# Inpestor 1.0 (Innovative Pest Attractor) to Increase Productivity of Tobacco as Superior Commodity in Southeast Asia

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*Abstract* - The production of tobacco in Southeast Asia had reached over 1 million tons in 2018. However, tobacco farmers tend to crop failure about 25% that is caused by the main pest such as Spodoptera litura, Myzus persicae sulz, Agrotis ipsilon, Bemisia tabaci, Thrips parvispinus, Gryllotalpa africana, and Helicoverpa armigera. The utilization of synthetic pesticides could endanger the environment and increase pest resistance to pesticides. The previous inventions have some weaknesses, for instance, use non-waterproof materials, unportable design, and only suitable for limited pests. Therefore, the innovators have created an automatic and effective device based on several pest's morphologies with renewable energy entitled Inpestor 1.0. The problem statements of this innovation are how to create Inpestor 1.0 according to pests' morphologies that work automatically in an eco-friendly way and how are the advantages of Inpestor 1.0. The objective of this innovation is to create an automatic tobacco pest trapper based on pests' morphologies as an eco-friendly way to prevent the pest attack. This device is using three different LED lights and tubes covered by yellow stickers that are applied by a mixture of essential oil with attractant glue. The benefits of this invention are can be used for 6.2 working hours, traps large numbers of pests with an average of 699 pests in 10 days, the weight is only 6 kg, replace synthetic pesticides in its use, and increase the farmer's productivity and farmer's income up to 10%. Meanwhile, the benefits to society of Inpestor 1.0 are helpful for the farmers and agricultural economy, safe for the environment because this innovation uses an eco-friendly way to trap the pests and contribute to a smart farming ecosystem. The novelties of this device are (1) effective, (2) automatic, (3) safe and waterproof, (4) eco-friendly, (5) portable. It has a better system than 10 previous innovations and has an affordable cost of around $90.12. This device is also potential to be patented through the physical design, electrical circuit design, and innovation system design.

Keywords: Pest morphology, Pest trapper, Tobacco Pest

# Sustainable and Flexible Photovoltaic Module with Novel Palm Oil Fibre Bio-Composite Backsheet Material

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Pang Ming Meng

Taylor's University

*Abstract* - Photovoltaic (PV) cells that produce electrical power from incident solar radiation have been at the forefront among green, renewable energy technologies in the past few decades. Solar photovoltaic power is especially attractive because of its accessibility to an individual consumer. It can offer tangible returns with minimal capital and can be integrated with the grid or remain off-grid to service remote locations. Presently there exist two major device morphologies for converting solar radiation to electricity – the conventional rigid PV modules used in large scale static installations and the flexible thin-film based PV modules prized for their portability. Commercially available flexible PV modules are mostly used to power small scale electronic devices on the go such as mobile phones or tablets. Though flexible PV modules offer the ability to convert a ubiquitous resource (solar radiation) into a more useful and versatile form (electricity), they are limited by their own share of caveats – limited flexibility (30% on average for commercial flexible modules), reliance upon non-biodegradable polyolefins for backsheet fabrication and the large carbon footprint of end of life recycling. Current recycling techniques mainly focus upon the recovery of precious and/or expensive metals (aluminium, copper, silver) and semiconductors (Silicon, Germanium, Gallium) since they provide a financial incentive with facile turnaround in the short term. The function of a PV module backsheet, usually ignored during recycling, is to protect the module from the ingress of moisture, dust and any other contaminants. The backsheet consists of a layered structure of polyolefin films, commonly polyvinyl fluoride (PVF) and polyethylene terephthalate (PET). The only viable option for the recycling of these polymers is disposal in landfills which detracts from the environmentally friendly nature of PV technology. To overcome these shortfalls, this work proposes a green, more flexible (> 30%) and portable PV module with an oil palm fibre (OPF) based backsheet. To the best of our knowledge, there is no prior study on using OPF as composite material for flexible PV backsheet. The use of palm oil wastes offers manifold benefits – reduction in cost of PV modules via the usage of cheap OPF, increased value addition to oil palm waste, improvement in the thermal performance of PV modules via increased thermal conductivity of backsheet and enhanced recyclability of backsheets via bio-degradation or pyrolysis. The primary focus of this work is tapping into the latent potential of a plentiful resource in Malaysia to enhance PV technology.

# Decision Support Tools for Sustainable Land Allocation and Utilisation of Oil Palm Plantations

Jaya Prasanth Rajakal, Pang Ming Meng, Koay Seong Chun, Wan Yoke Kin, Viknesh Andiappan

Taylor's University

*Abstract -* Palm oil is one of the most important vegetable oils, accounting for more than 30% of global vegetable oil production. The high productivity of oil palm trees allows for available and affordable cooking oil. The global population growth has resulted in continuous increase in demand for palm oil. However, competition from urbanisation and industrialisation have made land resource scarce for plantation expansions. This has led to conversion of ecologically sensitive regions like tropical forest, peatlands, etc for palm plantations, resulting in GHG emissions, loss of biodiversity, and environmental degradation. Recently, the European Union has restricted the import of palm oil, claiming extensive deforestation for plantation expansions. This work draws motivation from these recent developments and is an attempt to address the concerns on sustainable plantation expansions. This work proposes a mathematical model to determine optimal land allocation and utilisation for palm plantations to achieve maximum profit with minimum carbon footprint and land footprint. Novel techniques like automated targeting and discounted carbon cost are applied in developing the model. The proposed model can aid as a decision support tool to policy makers and agro companies in sustainably managing the land resources, thereby gaining acceptance of palm oil in the international market. The model can be commercialised as a software that can be used by agro companies to manage their land assets.

# Future Electric Vehicle Charging Stations Based Power Factor Correction Integrated Vienna Rectifier

Gowthamraj Rajendran, Kameswara Satya Prakash Oruganti, Chockalingam Aravind Vaithilingam

Taylor's University

*Abstract -* One of the major growing concerns of this era is environmental sustainability. Our ecosystem is partially degraded by various factors such as industrial waste, electricity generation process, commercial and residential buildings, and agricultural industries. A quarter of the world's greenhouse gas emissions come from transportation. However, the main challenge in mitigating Earth's rising climate effects is the lack of facilities for the public to engage. Global warming is intensifying demand for electric vehicle (EVs), and fossil fuel is often identified as a major cause for greenhouse gas effect and global warming. The global push for EV is slowly gaining momentum as many countries are seeing an increase in EVs on road especially in south-east Asian countries including Malaysia. However, the main challenge lies in the number and quality of the EV charging infrastructures and the single charge time. Analysis indicates that DC fast-charging infrastructure helps to increase the EVs on the road as it takes 5-30 mins to fully charge EVs whereas level 1 charging station takes 6 to 8 hours and level 2 charging station takes 3 to 4 hours to fully charge EVs. The frequency of the required charging and the volume of charge loads (EVs) of the future makes the need for effective power converters, if not taken care will make the grid less resilience. Due to the presence of power electronic converters in DC fast charging, the input current harmonics increases to more than 5% which results poor power factor at power system networks. To overcome the above issues, a new type of power factor correction (PFC) integrated Vienna converters is introduced in this work. This significantly reduce the input current harmonics by less than 5 % (recommended IEEE-519 standard range) with the converter efficiency close to 98%, and higher power density reaching up to 12 kW/$〚dm〛^3$. Furthermore, to improve the performance of the Vienna rectifier, the next-generation power device called Gallium Nitride-based MOSFETs based converter with power factor correction at the input side are introduced, which will be the future integration of EV charging infrastructures. This type of device operates at a high switching frequency, which reduces the overall losses. As a result, the power density of the system will be improved. This leads to a reduction in the size of the system. In this research work, the Gallium Nitride-based MOSFETs are used to develop a high-power density Vienna rectifier for EV charging stations.

# Snake Fruit Peel Chips as a Healthy Food in Efforts to Reduce Blood Glucose Levels in Sufferers Diabetes

Nur 'Azmi Dieni Sa'adah, Alia Raunaqi Najiha, Ratu Mutia Aqila, Maulida 'Aisyah Al Azkia, Asmi Aris

Sunan Pandanaran Islamic Junior High School

*Abstract -* The American Psychological Association (2013) reports that there are 382 million people who suffer from diabetes in the world. By 2035 this figure is expected to increase to 592 million people. It is estimated that of the 382 million people, 175 million of them have not been diagnosed, so they are threatened with progressive development into complications without being aware of it and without prevention. Until now, 4.6 million cases of death have been recorded each year and more than 10 million patients experience paralysis and complications such as heart attacks, strokes, kidney failure, blindness, and amputations. Indonesia has 1,000 types of plants that can be used as medicinal plants, of which only 350 species have been widely used as medicinal raw materials. Salak skin contains simplicia and cinamic acid which play a role in reducing sugar levels. The aims of this study were (1) To determine the effect of Snakefruit Peel as a healthy snack in reducing sugar levels in diabetes, (2) Knowing the content of Snakefruit Peel Chips As A Healthy Food In Efforts To Reduce Blood Glucose Levels In Diabetes Sufferers, and (3) Knowing Snakefruit Peel Chips Formulation As A Healthy Food In Efforts To Reduce Blood Glucose Levels In Diabetes Sufferers. The research method used is experimental. The manufacturing stage is carried out through preparing the tools and materials, drying the ingredients, and the process of making chips. The data analysis technique used is a descriptive percentage. So that the results obtained from this study are that there are innovative products as healthy snack products to reduce sugar levels in diabetics by utilizing the content of simplicia and cinamic acid in Snakefruit Peel .

Keywords: Chips, Diabetes, Healthy snacks, and Snakefruit Peel Chips.

# Jamaican Cherry and Ginger Tea as a Healthy Drink in an Effort to Increase Immunity During the Coronavirus Disease (Covid-19) Pandemic

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**Abstract -** The COVID-19 pandemic is a serious problem that must be handled by all countries in the world, especially Indonesia. Positive cases of Covid-19 continue to increase rapidly, according to Worldmeters data on Friday, 5 March 2021, positive confirmation of Covid-19 totaled 1,368,069 people with a death toll of 37,026 people. This spread is very fast considering the condition of decreased immunity due to lack of activity and stress during the COVID-19 pandemic. Antioxidants in the world of health are believed to be one of the compounds that can prevent various types of diseases, due to their ability to neutralize free radicals. Indonesia is known as a spice-producing country and there are 30 thousand types of plants from 40 thousand plants in the world. Indonesia has been pursuing medicine for a long time by utilizing a variety of plants found in nature. Cherry leaves (Muntingia calabura) contain 0,999 IC50 and ginger (Zingiber officinale) contain 2,075 IC50 which can be used as antioxidants to increase body immunity during the Covid-19 pandemic. The objectives of this study were (1) To determine the effect of jamaican cherry leaves as a healthy drink to increase body immunity, (2) To determine the content of Jamaican Cherry And Ginger Tea as a healthy drink to increase immunity during Covid-19, and (3) To know the formulation of SENJA TEA (Kersen and Ginger) as a healthy drink to increase immunity during Covid-19. The research method used is experimental. The process to produced Jamaican Cherry And Ginger Tea are preparing the tools and materials, drying the ingredients, the process making powder, and making tea. The data analysis technique used is a descriptive percentage. So that the results obtained from this study are that there are innovative products as beverage products to increase body immunity during the COVID-19 pandemic by utilizing antioxidants in jamaican cherry (Muntingia calabura) and ginger emprit (Zingiber officinale).

Keywords: Covid-19, Immunity, Ginger Emprit, and Jamaican Cherry

## UMS Location-based Augmented Reality Tour Mobile Application

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Universiti Malaysia Sabah

*Abstract –* Following the fast forward development of advanced technology and the expansion of smart gadgets, we cannot deny that technology plays a significant impact on the way we live and communicate. However, current tourism application still has limited attractive and informative content about the location of attraction places, especially in Universiti Malaysia Sabah area. This mobile apps could assist the tourists in finding their directions, access to useful information and the facilities around the campus. This mobile application also shows the attraction places around Universiti Malaysia Sabah campus, in an interesting way to attract users. This project changes the way in presenting some information to user from a normal text and image display on the screen to a real-time Augmented Reality with the Location-based technique. It also provides recommendation for the user based on their chosen preferences. The results of this project used to evaluate the user acceptance using usability testing on 10 random respondents.

## Chatbot: Virtual Counsellor using Speech Emotion Recognition System

Edlaura Mag Eiry, Aslina Baharum, Siti Hasnah Tanalol, Farhana Diana Deris, Noorsidi Aizuddin Mat Noor

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*Abstract -* The increasing pressure that comes from school today has been impacting adolescents prone to psychological illnesses. Students who suffer psychologically, are often unwilling to share their problems and struggles with others and even more not likely to seek psychological assistance due to the fear of bad judgement. In the era of evolving technology, chatbot is introduced to be people's virtual companion, when they need someone to talk to. However, chatbot usually works in such a programmatic and predictable way that people only engage with the bot for a while and after that, they lose interest in it. A chatbot to be helpful must be able to recognize people's emotions. Hence, the Virtual Counsellor mobile application embedded with Speech Emotion Recognition chatbot is proposed to solve these issues. In the methodology, three phases need to be conducted in the development of this project. First phase focuses on developing mobile application for students to be able to improve and manage their mental health. The second phase is the implement a chatbot that is able to read the emotion of the user through tone expression. Third phase is to evaluate the user experience of the developed mobile application through User Experience Questionnaire (UEQ). The User Experience Questionnaire and Chatbot presented a positive feedback from testing participant with the UEQ overall scale of positive 1.375. The participant also believe that Virtual Counsellor have a great potential to help students that have difficulties to seek for psychological assistance physically. Throughout the study, a Virtual Counsellor mobile application is created with the implementation of Speech Emotion Recognition Chatbot as an alternative for someone who have difficulty in meeting counsellor to seek psychological help. The development of the application is expected to increase mental health awareness among students.

# Easy Carry Easy Display (E.C.E.D) 2.0

Ahmad Lutfee Bin Mohd Lasa, Mohammad Suffian Bin Abdul Kadir, Amelia Chong Wan Ni, Phang Ee Wei, Angella Ling Jin Yii, Sean Wong Jiun Jieh, Paul Ubris Aro Anak Joseph Jubin Aro, Kelvin Hii Sieng Wan

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*Abstract* - Teaching and learning in post covid 2019 were very challenging and consume a lot of effort in ensuring student maintaining their interest and momentum in learning. E.C.E.D 2.0 is a product which design for preschool teacher and it also benefits to the student's education.  The improvement from previous E.C.E.D design which the benefit was mainly focused for teacher.  Further exploration and development of this product are needed to expand the benefit to the student as well as to the teacher while having outdoor learning. When action research is carried out by the researchers in a few preschools in Sibu, Sarawak, the feedback from teachers, parents and also students who are collected as qualitative data.  Based on these triangulated data, E.C.E.D 2.0 is well accepted as an innovative product which is users-friendly, less space consuming with cost effectiveness.  The spirit to explore new aids that can bring benefits in education will be encouraged and further exploration. It will teach or delivered more than a knowledge for the students compare with reading a book.  The innovation of this product is encouraged to meet current and future needs of 21st century classrooms in the country.

KEYWORD:  Preschool aids, outdoor learning, pedagogy

# Fun & Learn 3R: A Playbook for Pre-School Kids V2.0

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*Abstract* - Fun & Learn 3R is an educational playbook focusing on 3R concepts. It is designed for pre-school kids. Pre-school kids in Malaysia are lacking of environmental exposure because environmental education is provided to primary and secondary level students. Furthermore, there is a lack of suitable activities for pre-school kids to expose to environmental education. Therefore, this playbook is created as an edutainment learning tool for pre-school kids to obtain some early exposure of environmental knowledge. The main objective of this game is to develop visual perceptual skills and environmental interest among pre-school kids through a fun learning approach. In terms of its novelty, it comes with various hands-on and interactive activities to develop kid's environmental knowledge. Besides, it can also enhance the kid's psychomotor and visual perceptual skills which are important in their early learning stage. The benefits of this product are: i) it is easy to play ii) it builds early awareness iii) it helps to train environmental lovers who are able to save our natural resources and wildlife iv) reduce pollution. It is suitable to be used as a teaching aid by pre-school teachers or parents. Fun & Learn 3R is a superlative edutainment learning tool in 21st century.

# Intelligent Taxpayers (iTax)

Sholehah Abdullah, Siti Fatimah Mardiah Hamzah, Nik Noor Afizah Azlan, Salwani Affandi, Nur Azwani, Mohamad Azmin, Zaimi Mohamed, Fathiyah Ismail, Suhaily Maizan Abdul Manaf

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*Abstract -* Tax planning is a crucial element in personal financial management, allowing a taxpayer to make the best use of various tax exemptions, deductions, and benefits allocated by the government to minimise tax liability. In support of the National Strategy to intensify financial education and elevate Malaysians' financial literacy, a team of lecturers at Universiti Teknologi MARA Cawangan Terengganu (UiTMCT) have developed a creative financial tool known as iTax (Intelligent Taxpayers). The idea is also in line with university policies that promote blended learning and the latest teaching aids appropriate to student needs. iTax was initially developed based on simulation technique and introduce to a group of students enrolled in the Personal Financial Planning course at UiTMCT. The simulation module enables students to experience the essence of record-keeping and related activities in tax planning. There are various sections in Income Tax Act under which an individual taxpayer can claim exemption, deductions and benefits. During the simulation cycle, each student would assume an individual who has a monthly salary for his chosen career and family scenario. Based on certain assumptions, students are required to record their monthly income and all expenses or transactions related to tax reliefs, deductions and rebates allowed by the government. Every student must analyse his financial situation based on a tax efficiency point of view to invest and utilise the resources optimally. Finally, they need to develop an annual income tax return that optimises the available reliefs and benefits while minimising their tax liability. The system is expected to enhance students' potential to achieve an excellent grade in personal financial planning or similar courses and empower them with knowledge, skills and readiness to face real-life situations. The system is suitable for students to use as an alternative e-learning media and equip individuals with a simple tool to manage their tax-related matters.

# Solid Waste Management Hierarchy of Households in Malaysia

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*Abstract -* Solid waste management is a local issue with global implications. Rapid population growth, increasing urbanisation, changing lifestyles, and improved economic conditions have increased the amount of waste generated and has also brought with it new types of waste. As the world's population continues to grow, so does the amount of waste being produced. Inadequate solid waste management can impact cities and their residents in myriad of ways. These impacts can generally be categorized into three: human health; environmental and socioeconomic. Thus, efficient recycling of solid wastes is now a global concern for a sustainable solid waste management. The waste management hierarchy, an evolution of the waste management ideology of the"3Rs"(reduce, reuse and recycle) concept, is a sequence of steps on how to manage waste properly. Leaning upon the concept of solid waste management hierarchy, this study examined the level of participation of households in waste minimisation in Malaysia. A total of 150 copies of semi structured questionnaire were purposefully administered to adults in Malaysia, through an online survey. Their responses were coded into the computer and analysed using SPSS version 20. Frequency and Chi-square tests were conducted on the data to examine the level of participation of respondents in waste minimization. Findings from the study revealed that 58%, 48.6% and 45.3% of respondents reuse their old plastic bags, bottles and newspapers respectively. The chi-square results equally showed that significant differences exist in their level of participation in waste minimization ($p<0.05$). Findings from the study equally showed that the lowest hierarchy in product recovery is recycling. Recycling is cheaper and more environmentally friendly alternative than seeking new landfill sites, and can help extend the lifespan of existing landfills. The study has contributed to sustainable urban waste management through identifying the level of participation of households in Malaysia on 3Rs waste minimization strategy. To attain higher rate of recycling, people must be taught and motivated. Thus, government needs to embark on more enlightenment campaigns and programmes to let people know the benefit accruable from recycling.

Keywords: Solid Waste, Waste Management Hierarchy, Households, 3R's Concept, Solid Waste Minimisation

# Eco Friendly Sound Proofing from Organic and Inorganic Waste: Our 3R Project

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Lab School Elementary School

*Abstract -* In this work we present our project to Reuse Reduce and Recycle (3R) waste in our neighborhood. The 3R is one of our school program. Start with my beloved country Indonesia produces nearly 200,000 tons of waste a day in 2020, not only plastic but also paper, rubber, food. On the other hand organic waste were also environment problems especially Leaves fall during dry season. Several main street in our city full of falling leaves. We try to found out how the inorganic waste is processed. Solid waste incineration is often presented as a the fastest solution to reduce rapidly growing waste volumes but it is It is expensive, inefficient, and creates environmental risks. Because in its process using toxic materials. And for falling leaves waste the solution is burn the leaves caused unhealthy smoke. In our project we reuse organic waste specially falling leaves and inorganic waste from plastics, paper etc. to be Eco friendly sound proofing. We test the waste using audio meter to investigate which waste and its process that can be reduce sound more using sound source 72 decibels. Our works shows that cardboard reduce only 2 decibels but if the cardboard in form of powder mixed with glue reduces 7 decibels, plastic bottles reduce only 2 decibels. Jackfruit leaves reduce 5 decibels. bread fruit leaves reduce 2 decibels but in form of powder and glue reduces until 10 decibels. Our sound proofing materials can be use as curtain to reduce noise from outside. Our sound proofing material easy made, cheap nontoxic and ecofriendly

# Vallavan Herbal Hand Sanizer

Jyvita D/O Rames, Divashinee D/O Ganesan, Vineessh S/O Ravisangkar, Krissanya D/O Balaragawan, Kabilohshini A/P Nadarajan

Sekolah Jenis Kebangsaan Tamil Jenjarom

*Abstract -* In the verge of vaccination programs around the globe, hand hygiene is a mainstay of efforts to prevent the spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes COVID-19.People who have the infection may show few, if any, symptoms, but still be able to transmit the virus. The virus spreads via droplets in the air or on commonly used surfaces, such as door handles. Therefore, our hand hygiene and Washing the hands thoroughly with soap and water for at least 20 seconds is a highly effective way to defend against harmful bacteria and viruses.Herbal hand sanitizer made from combination of AleoVera, Neem, Alum and Champor. This is natural skincare solution that is absolutely great for your hand and skin. All those herbsand other natural ingredients can benefit our skinand kills 99.9% of germs including bacteria, microorganisms and flu virus. This herbal hand sanitizer rinses gives a fresh feel and maintain skins natural texture.

Key words : Hand Sanitizer, Herbal, Washing, Virus, Highly effective

# Android Application for Measuring 21st Century Skills' Junior High School Students using Virtual Laboratory

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*Abstract -* The develop of science in 21st century is faster than before, which means we need competent teacher who has character. So, junior high school student will be adapt for every advancement of science and technology. Therefore, the quality of educational mus be improved. As we know, schools as educational institutions are required to have the ability to think creative, critical thinking, communication, and collaboration. With the development of 21st century skills, it is expected that every student has the skills to live in the 21st century with various opportunities and challenges that will be faced in the era of technology and information. Some experts explain the importance of mastering 21st century skills as a means of success where the world is developing rapidly and dynamically. The 21st centrury is known as the disruptive era, which means the change from manual processes to digital ones not excluding education. The benefit of digital technologies can be used to measure creative, critical thinking, communication, and collaboration. In this work we present development of Android application for measuring 21st Century skills's junior high school students. We built a virtual science experiment's video. Based on the video we extract multiple choice questions to measure Creative, critical thinking, communication and collaboration (4C) skills based on Esther core et.al (2018). The instrument then reviewed by science education experts. Then we collect all content to develop android application (apk) using android studio. The users can install it in their android based cell phone, when it is opened there's will be an option to measure 4C. First they have to watch the video, based on the video they can start to fill the 4C questions. After they finish the result will show recapitulation of their 4C's grade. This apk can be an alternative tools measuring 21 st century skill for junior high school both for students and science teachers. It is an easy users tools and the results directly showed.

## Penyu Kita the Turtle Awareness Mobile Apps

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University College TATI (UC TATI)

*Abstract -* Turtle eggs were consumed in the past as a source of protein for coastal communities in Malaysia as they lacked access to alternative sources, but this was no longer necessary. In 1960s, the population was just 10 million people and nesting numbers were much higher. In 2020, a population of 32 million but nesting numbers are decreasing and unstable. People need to stop the consumption of turtle eggs because the nesting numbers are fluctuating between 2,000 and 4,000 per year in Terengganu. Turtle conservation groups wanted to continue raising awareness. At the moment, this society still don't have any mobile application. In order to support the educational programme, an Android application named Penyu Kita is developed. This application is built using the MIT App Inventor 2. Penyu Kita has five modules altogether. All the modules including the name of the application is in Malay language as requested by the Turtle Conservation Society of Malaysia. The first module is informasi (information) has types of turtle environment, physical and threats. The second module, kesedaran (awareness) lists the do's and don'ts regarding turtles. The third module that is permainan (games) consists of two games that are true or false and memory game to match pictures of two same turtles. The fourth module, aktiviti (activity) is some educational units in the form of Portable Document Format (PDF) files. The fifth module that is Aduan (Complaint), a report towards the threatened turtles (s). Penyu Kita is found to be suitable for local students and local contexts, therefore the Turtle Conservation Society of Malaysia agrees to use the application for their future educational programme.

## Development of Gamification in Tourist Guide Application

Jocelyn Joyce Benjamin, Aslina Baharum, Nur Shahida Ab Fatah, Farhana Diana Deris, Noorsidi Aizuddin Mat Noor

Universiti Malaysia Sabah

*Abstract -* A static image is a non-interactive media. Non-interactive media is no need for communication or interaction done by humans. Interactive media refers to the conceptual interaction design, new media, interactivity, the interaction between persons and computers, digital culture, graphical user interface, interactive design, and virtual reality. An interactive system aims to help the user achieve the objectives from the application domain. The interactive media were instructional realistic, purposefully emotional involvement, and bridging learning tasks to social awareness in a ubiquitous learning environment. Interactive advertisement is effective in attracting users. However, there are many applications developed with non-interactive media, thus lose visitor's attraction. In this study, virtual reality (VR) is introduced into the system because VR represents an interactive computer-generated environment and allows users to create endless virtual interactions, both real and virtual. Besides, gamification is used to develop users' motivation to remain focused on the application in use. Therefore, the visitor will get unforgettable experiences when doing a tour in UMS.

## The Use of Piezoelectric Energy Harvester in Speedbump with Passing Vehicle to Generate Clean Energy

Tajul Afiq Bin Tajul Arus, Loh Mun Ki

Imperium International College

*Abstract -* With the world increasing consumption of energy demand, clean and renewable energy sources are getting more popular and piezoelectric energy harvesting is a subject undergoing intense study. Piezoelectric material contains crystals material that can change mechanical vibrations into electric energy when mechanical stress is applied on it. Sadly, a proper power generation on harvesting high output of voltage from piezoelectric material have not found yet. The idea of harvesting electrical energy from vehicles passing through speedbump at varies speed was presented. With a proper analysis on deflection and stress distribution on the speedbump was analyzed by using ANSYS Workbench to convert the mechanical energy into electrical energy. Explicit dynamics was used to study the behavior of the wheel going over the speedbump and PZT tile at velocity of 5km/h, 10km/h, 15km/h, 20km/h, 25km/h, and 30km/h are observed and analyzed. With better positioning of the piezoelectric energy harvester and power circuit, it can obtained a high output voltage. In this innovation project, a high stable output of 3V was achieved when the velocity of the car passing over the speedbump is above 15km/h.

# Automatic Fish Feeder and Cleaning Notification Tool

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*Abstract -* Owning a pet has measurable benefits for your health. One of them is fishes in the home aquarium. 6 benefits associated with keeping a home aquarium are Reduced levels of stress, Improvements in sleep quality, Lowered blood pressure and heart rate. Decreased pain and anxiety, Improved focus and creativity, and calming effect for children and Alzheimer's patients. However, one obstacle is taking care of their feeds and home. We have a solution for that. In this work, we present a device installed in the home aquarium that can be automatically feeding the fish and give notification via short message on your cell phone that the aquarium needs to be cleaned. The device consists of three main parts. The first part is a mechanic open-close system of fish food sources. The second part is light intensity turbidity detection and the third part is a microcontroller. In this work, we use Arduino-Uno. We set the microcontroller to regulate the food valve open in approximately 1-2 minutes and closed after that. We set the feeder system two times daily and it can be programmed to set the time depends on the type and number of fish or as requested. For cleaning notification, we use the bottom of an aquarium source of the light and light intensity detector in the top of the aquarium. If the light intensity is reduced by 30% then the device will automatically send short messages to the owner that the aquarium needs to be cleaned. This device is operated by 9 volt DC power, the power supply is used to run the entire system consisting of voltage. The smallest system is a circuit electronic device. It was designed to act as a data processor, with a microcontroller as the control center, and a mechanic as a DC motor drive to provide fish feeds. The microcontroller is adjusted through the program so that can be work through the provided functions. Besides that, the tool also provides a sensor detector for detecting turbidity in an aquarium.

## Low Cost 3D Printed PLA Robotic Arm Prosthesis using Snap-On Joints

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*Abstract -* A simpler prosthetic design was made by using PLA as 3D printing material and using a simple Snap-On design for the joints. The 3D model of the robotic arm prosthesis was design by using Autodesk Inventor software. Then, the model was simulated using Ansys static structural with PLA as the material and load bearing of 25kg was applied as the boundaries condition. With the simulation verification, the robotic arm prosthesis was manufactured by 3D printing using Ender 3 Pro with PLA filament an 0.2mm layer height and 20% infill. The assembly is done before testing using fishing line as tendons and 5 servo motors for the movement. An Arduino program was used for the demonstration of the movement of the prototype. During gripping testing 9 household items were being used to demonstrate different types of power grips. During strength gripping test, the prototype can generate 12kg of gripping force with the 5 servo motors and mechanically it can withstand 35kg of gripping force. This design has decreased the part number by 71.7% and the total mass was reduced by 62.5% compared to the original design of Inmoov's prosthesis robotic arm. Overall this innovative project has successfully improving the overall design and material used for prosthesis robotic arm which previously heavier and bulky.

## Autonomous Grease Trap Maintenance System Based On Internet Of Things (IoT)

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*Abstract -* The untreated kitchen wastewater generated from the commercial kitchen operation without a proper disposal method has ben causing numbers of sewer piping clogging cases in the recent years. The irregular schedule of executing grease trap maintenance will lower down the efficiency of removing that fat, oil, grease (FOG) and food particles in wastewater before going to the sewage treatment system. An autonomous grease trap maintenance system was designed based on internet of things (IoT) to monitor the conditions of wastewater and automatically carry out the cleaning maintenance task to the grease trap. This system is using the turbidity and ultrasonic sensor to monitor the wastewater while a centrifugal pump will pump out the wastewater when it triggered the sensors. The "1/4 rule" of grease trap regulation was implemented by using the pump to discharge the wastewater to avoid exceeding 25% of grease trap volume. As a result, the autonomous grease trap has reduced the turbidity value of wastewater from 2305 NTU to 1269 NTU after conducting maintenance service. The wastewater removal efficiency of autonomous grease trap unit is about 81.64%. it is convenient, efficient, save cost and fulfil the maintenance requirements according to authority requirement.

# Framework of Shariah Compliance 5S Quality Management in Developing Policy for Achieving Sustainable Green Campus

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*Abstract -* Quality management is one of elements in maintaining quality of education in university. This study developed framework for 5S quality management that comply with Maqasid Shariah. This framework integrating 5S knowledge with Islamic values in attaining better interpretation of quality assurance focusing on education system in university. This study also validated the framework of Islamic compliance 5S quality management using structural equation modelling. This study performed quantitative method in assessing the awareness and acceptance of 5S quality management among students in university. Theory of Planned Behavior (TPB) is selected as underpinning theory for conceptual research framework. The result shows all three variables namely, attitude, subjective norm and perceived behavioral control are significant in assessing the awareness among students regarding 5s quality management application. The finding of this study adds knowledge to body of literature. In the same time, this study helps practitioners in developing policy for university in achieving sustainable green campus.

# FISHGAS: Environmentally Friendly Fish Waste Biogas as an Alternative to LPG Fuel

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*Abstract -* Fuel is an essential requirement for humans in everyday life, especially for cooking. The fuel commonly used for cooking is LPG (Liquefied Petroleum Gas). In fact, the raw material for making LPG is a natural resource that cannot be renewed, if it is used continuously, its availability in nature will run out, so we need alternative natural fuels that can replace LPG to fulfill community needs. On the other hand, the percentage of fish waste in Indonesia is increasing because it is increasingly used and underutilized. Based on this problem, an idea was found to use fish waste into biogas as a substitute for LPG. The dominant $CH_4$ gas content in biogas can be produced from the utilization of fish waste by fermentation through anaerobic processes with the help of probiotic bacteria. The percentage of fish waste in Indonesia reaches 20-30% of fishery production, or around 2 million tons per year. The waste used here is fish stomach waste (offal) because it decomposes more quickly so that the decomposition process is faster. The process of making FISHGAS begins by smoothing the water hyacinth together with fish waste by blending it. After that, molasses, EM4 and water are added in a ratio of 5:1:5. Added yeast that has been mashed, then closed according to the design. So, the use of fish waste for biogas production is expected to reduce the use of LPG, which is increasingly expensive, and can increase the value of the function of fishery waste. In addition, the use of FISHGAS is an alternative to environmentally friendly fuels because the raw material is processed from fish waste, which is disturbing because it can pollute the environment.

Keyword: Biogas, Fish Waste, and Community Needs

# Smart Intergrated Assistant for Anxiety and Panic Attack (S.I.A.P.A) Watch

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*Abstract* - Mental health issues have become an important topic in the last 30 years. According to Basic Health Research in 2018, the research shows that the generality of mental disorders which are indicated by symptoms of anxiety and panic attack, these symptoms can affect children in the age of fifteen and over about 6.1% of the total population of Indonesia or the equivalent of 11 million people. Based on The IHME (The Institute for Health Metrics and Evaluation) research, the research shows that 6 out of 20 illnesses that are responsible for causing disabilities are mental illnesses. Anxiety Disorder is a mental health disorder that is different from normal feelings of nervousness and involves excessive fear. There are some symptoms of anxiety disorder that includes rapid heartrate, irregular breathing, and restlessness. In this modern era, we are quite helped by the rapid development of technology. One of the technologies that have practical use including medical purposes use is a smartwatch, but unlike regular smartwatches, S.I.A.P.A watch is for people with anxiety. The problem in this study is how this smartwatch could help people with anxiety disorders and how to prevent them from becoming more dangerous mental illnesses. The purpose of developing S.I.A.P.A watch is to help people who suffer from anxiety disorder and how to handle panic attack, and ways of relaxation. For now, the regular smartwatch features are still limited to help people with anxiety disorder, so a special smartwatch is needed for that. S.I.A.P.A watch is for people with an anxiety disorder is developed on an Android basis with several types of sensors that are supported by AI (Artificial Intelligence) technology such as heart rate detector, temperature and humidity detector. When someone uses this smartwatch and experiences one of the symptoms of anxiety, S.I.A.P.A watch will provide pieces of information and recommendation on how to handle these symptoms. S.I.A.P.A watch is also has a reminder of taking medication and a music player to help the person to relax so they can sleep without problems. Besides all of the features already mentioned, this smartwatch is also equipped with a doctor consultation app and suicide prevention hotline. The advantages of this smartwatch are people who suffer from anxiety disorder can prevent the symptoms worsening and they can consult more often with their doctor every time and everywhere so it can prevent suicidal thoughts and decreases the suicide number over the years.

## Innovative Smart Riding Sensor for Safety Enhancement

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*Abstract* - Motorcycles are one of the most commonly used vehicles in Indonesia, with users from every part of the society ranging from students to employees. Yet, motorcycles also hold the highest traffic accident rate among other vehicles. In the Global Status Report on Road Safety (WHO, 2015) it was stated that every year, more than 1.25 million people worldwide die in traffic accidents and 50 million suffer mortal injuries. There is a dire need to ease this condition. According to Insurance Information Institute, motorcycle has the accident rate of 57.52% per 100.000 vehicles. In Indonesia, based on the data from Traffic Police Coordinates, 144 out of 310 traffic accidents were motorcycle accidents. Last 2018, there were 36,481 reports of motorcycle accidents, 41,758 accidents were recorded until April 2019, a 14.47% increase in that year alone. To alleviate this condition, the Smart Riding Censor is a speed and distance detecting device is designed to avoid and decrease motorcycle accident rates in Indonesia. Smart Riding Censor is put under a motorcycle's front lights, connected to the motorcycle's battery to send light and voice signal and decreases the motorcycle speed when the driver exceeds 80 km/hour, the maximum speed limit. Other than giving signals to the driver, the censor also detects when two vehicles are less than 2 meters within each other. This Smart Riding Censor can be activated within the push of a button as desired by the driver. Research and Development methods were used in creating this innovation. By producing signals for the drivers and detecting distances among vehicles, this censor is ought to decrease motorcycle accident rates and assuring the safety of motorcycle drivers on the road. This Smart Riding Censor is aimed to reduce motorcycle accidents, where most of the accidents are caused by drivers who do not comply traffic rules.

# "HSSbuzz" Automatic Hand Sanitizer Spray with Buzzer & Human Sensor

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*Abstract -* The number of COVID-19 sufferers in the world is still very high. According to WHO (2021) from data on April 18th 2021, it was confirmed that Covid-19 positive patients were 140.322.903 and 3.003.794 deaths. This is caused by unhealthy living behavior by ignoring healthy life protocols, lack of awareness of hygiene, especially in a crowded place. To anticipate virus infection is by washing hands and using hand sanitizer. The use of hand sanitizer that is measured now, already use automatic sensor, but there are still many people who are dilatory in using it, so an automatic hand sanitizer with a warning sensor is needed for its use. The purposes of this study are, first, to increase awareness, consciousness and behavior towards human characteristic who ignore health protocols, especially in the use of hand sanitizer. Second, is to reduce the rate of virus transmission through frequent human contact. The research method we used is an applied research methods. HSSbuzz consists of human sensor, which is ultrasonic sensor and camera. Function of ultrasonic sensor is to detect hand movement when its moved close to the hand sanitizer's sensor, with the result that hand sanitizer liquid will release automatically without touch. Camera is use to detect whether the hand is already using hand sanitizer or not. HSSbuzz also consists of microcontroller, LCD, buzzer, and hand sanitizer container. Microcontroller is a control center of all chains. Microcontroller will saves data that sent by sensor, which will displayed in LCD and set buzzer on standby mode. The data displayed on the LCD is status of hand sanitizer usage. Buzzer will triggered if there is person who refusing or abandoning the use of hand sanitizer on HSSbuzz. Based on the results of pra-research , we can concluded that Automatic Hand Sanitizer Spray with Buzzer & Human Sensor "HSSbuzz" machine will works properly as expected, which is can find out people who has or has not used a hand sanitizer and make it easier to use, as well as being a reminder to the public when entering a building or room with sensor and buzzer, so HSSbuzz can be more and effective in preventing virus transmission.

# Bilingual Covid-19 Interactive Information via Android Application: An Alternative Easy User Interactive Tool for Raising Public Awareness and Comprehend of Covid-19

Kenny Raqiqa Arianto, Hesty Aprilia rachmadany, Natasya Salsabila Hermawan, Azizah, Yanti Nuryanti S.Pd

SMAIT Pondok Pesantren Terpadu Almultazam

*Abstract -* The rapid and extensive spread of the COVID-19 pandemic has become a major cause of concern for both general public and healthcare profession. Efforts to spread information regarding the risks of Covid-19 have been considered to lack effectiveness. As the result, public awareness over the risks of the new coronavirus remains low. For that we really need away to make public awareness and comprehend of risk of covid-19. Mobile phones have fast become the most pervasive technology in our daily lives. over three quarters of the world's adults own a smartphone. Most of them use android as operate system. In this work we present our work an android application that contains interactive information of covid-19 for all age. The features of this application is interactive medias such as link to videos contained information from experts about covid-19 in both in Bahasa and English. And other video things that should do to prevent covid 19 spread. Next feature link to a comic of how to stop covid-19 spreading both in English and Bahasa in simple words. we collect all content to develop android application (apk) using android studio. The users can install it in their android based cell phone. This android application can be an alternative to raise public awareness and comprehend of covid-19. It is an easy user with interactive media to deliver information

# Your One Stop Salon-tion meet Haira Chatbot

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Asia Pacific University of Technology & Innovation (APU)

*Abstract -* Haircut Appointment Intelligent Reservation Application (HAIRA chatbot) is an application design to help salons, by providing a platform for customers to not only locate hair salons, but also book appointments with their chosen hair salons via Haira chatbot. Movement Control Order (MCO) due to the pandemic caused by the COVID-19 virus, and the Standard Operating Procedures (SOP) mandated by the government requires everyone to maintain at least a 1 meter distance between each other. This One Stop Salon-tion mobile app Haira chatbot will help you solve this. With that in mind, the. It provides an accessible and all-in-one platform for hairdo services; HAIRA aims to provide users with an all-in-one platform for booking appointments with hair saloons around them. By migrating the process of appointment booking online, onto an application, HAIRA can help reduce contact between people, which in turn reduce the chances of infection of the COVID-19 virus. Even after the virus subsides, HAIRA is still able to benefit society because it promotes time management; its features such as the news feed feature can also increase the visibility of local salons and provide opportunities for advertisements. To summarize, HAIRA is a hair salon appointment booking system designed for times like this; not only does it help with controlling the virus during the ongoing pandemic, but it also helps take the hair salon industry to the next level.

# THINDER (Things Finder)

Taufik Syah Mauludin, Amata Kara Perdani Handiman, Dmitri Naufal Ghani, Ihza Maessa Cahyadi, Sandi Muhammad Roziq, Dr. Selly Feranie, M.Si.

Indonesia University of Education

*Abstract -* Humans have so many activities every day. Besides all their limitations, sometimes humans forgetting to put things that are considered important such as keys, wallets, etc. We always forget to bring our precious belongings and were the last time we put them. We always ended up with bad luck when we try to find it. Therefore, we need a tool as a search and reminder. This tool can prevent this problem. A wireless-based designed tool using Bluetooth as a transmitter and receiver to Arduino nano which regulates the components on or off the buzzer which can be controlled by the application on the owner's smartphone. This tool has communication capabilities with a range of 10 meters. When you want to find objects that already have this tool, open the application that is already installed on the smartphone, then connect Bluetooth. If Bluetooth is connected, then the object is within a radius that can be reached by Bluetooth. After that, press the search button to activate the buzzer. The buzzer will sound with a range of 95 dB. With that voice, we can search for objects that already have this tool. If Bluetooth cannot be connected, it means that the objects that already have this device are not within a radius that can be reached by Bluetooth. So the meaning is the object is not in the search area. When the object that already has this tool is connected to the application on the smartphone, then the owner of the smartphone leaves the object he was carrying so that the Bluetooth radius cannot reach it, then the smartphone application will notify that the device is out of reach, which means that the object being left behind. With relatively cheap devices, it is hoped that it can increase accuracy in carrying out other activities both for the owner of the tool and for those around him.

# ECO MULCH MATT FROM BANANA TRUNK

Lee Jun Xi , Ong Hui Yee , Sum Li Yan, Ong Hui Jun

SJKC Chukai Kemaman

*Abstract -* Present invention uses old banana tree trunk as a material for making mulch mat. It is a material spread around or cover a plant to enrich or insulate the soil. Eco Mulch Matt is important to your tree's health because: it insulates the soil helping to provide a buffer from heat and cold temperatures. With mulch covering the soil, it helps retaining the moisture of the soil, thus maintaining a steady water source for the plant. Eco Mulch Matt keeps weeds out by preventing its growth . This reduces the root competition between our plants and further encouraging their growth. Eco mulch matt is environmental friendly as we use old banana tree trunk for making the matts. This reduces the crop waste and save the cost of handling the crop waste. While the mulch mat can be use generally for many type of crops but specially for Hibiscus sabdariffa (Roselle) seeding.

Keyword : banana tree trunk , mulch matt , cold temperatures , moisture, environmental friendly

# Caventure as Innovative Cave-Based Tourism and Education Platform Towards Society 5.0 in Yogyakarta

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*Abstract -* Covid-19 gets a big impact on education and economic conditions. The Central Statistics Agency (BPS) report states that the Indonesian economy in the third quarter experienced a recession with economic growth reaching -3.49%. Previously, in the second quarter economic growth was -5.32% and the first quarter only grew by 2.97% (BPS Indonesia, 2020). This condition still continues until right now, but it's likely to get better. The latest data on economic growth in the fourth quarter shows an increase of 0.42% compared to the previous period (BPS Indonesia, 2021). The development of tourism experience and learning media in the form of android-based applications can be used as a solution in overcoming these problems. caventure as innovative cave-based tourism and education platform towards society 5.0 in Yogyakarta. Application of media cave based tourism and education will give a new approach in ecotourism. This application will be implemented in many caves in Yogyakarta which promote eco-edutourism. The use of technological platforms is in order to respond to digitalization of tourism that must be done in Society 5.0 era. Through this innovation expected can minimize the gap in humans and economic problems in the future. This study uses an The R&D model with ADDIE approach that limiting to three stages, namely: 1) analize, 2) design, and 3) development. The limitation is needed because of the limit of time and resources. The application development is using android studio, javascript, and html. This Platform will make benefit on education to learn about all about inside the cave and also in economic to the society around the cave as tourism manager and other small and medium enterprises all around the cave.

# EASY WATERPROOF SHOES COVER

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SJKCChukai Kemaman

*Abstract -* Have you ever encountered a situation like this ? You wear a new shoes out but it rains. Your shoes get wet and all muddy and you feel dreadful. This makes you feel uncomfortable and your feet get wrinkly after some time. To prevent all these problems, we have invented this invention to save both your shoes and your feet. This multifunctional shoe covers offer you a great chance to stay dry and clean when walking in the rain. Is it convenient as it can be slipped right over the shoes to provide a thorough protection for your shoes and legs. It is also washable and reusable for many time. It Suitable for the pupils, they can use the shoe covers when camping, during jungle trekking, the pupils can protect their shoes from getting dirty or muddy.

Keyword : cover ,   waterproof , clean  , protect shoe , comfortable

# Kaji English for Year 4

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*Abstract -* English is one of the compulsory subjects for all Malaysian students that is taught from the primary to the tertiary level. The importance of the English language is becoming more apparent as the world is embracing globalization and the medium for communication is mostly in English. However, it is well known that Malaysian students are still struggling with the language. As part of an effort to help Malaysian students improve the command of English, this project utilised Kaji to create an English learning package. Kaji is a quiz-based knowledge management system that was initially developed to help students learn in higher learning institutions. The main strength of Kaji compared to other similar applications is that it requires students to drill on short answer questions and self-evaluate their answers based on the answer scheme. The learning experience with the prototype version of Kaji has been shown to be beneficial to a sample of university students in improving their learning skills (Kamarulzaman & Shaari, 2015). Like any drill and practice application, Kaji also lets students learn at their own pace in a private environment safe from shyness and other feelings of insecurity. Currently, a special version of Kaji is being tested on several Year 4 students to provide an alternative teaching and learning experience of the English language. The Windows version of Kaji English for Year 4 is expected to be available to the public in September 2021. The copyright number for Kaji is LY2020001344 which was obtained from the Intellectual Property Corporation of Malaysia (MyIPO) in 2020.

# LIGHT-MAZE

Harchalar A/L Yogendran, Trisshna A/P Raghupathy, Cynthia Pereira A/P Edmond Pereira, Fairuz Binti Darus

SMK Sultan Badlishah

*Abstract -* This Light-Maze product is made to turn off the light when there is no presence of human being in a specific room or an area. The main objective of this product is to reduce the usage of electricity and reduce the risk of people getting cancer due to artificial lights especially during the night. Our product is made for workaholics who have a busy lifestyle and are often using their laptops or computers. This busy lifestyle is the reason why they forget to switch off the lights when they are at work or asleep. This eventually causes the electricity bill to increase tremendously. In addition, since they forget to switch off the lights when they are asleep, this causes them to have an unpleasant and uncomfortable experience while sleeping. This impacts them to have lack of sleep which affects their mood when they are awake. Our product can help workaholics as it turns off the light automatically so that their electric bills would not increase and it ensure they lead a healthy lifestyle. Our product can also be controlled wirelessly using a smartphone when the owner wants to switch on the lights even though they are not at home for security reasons. Our modal price is RM 110 while the cost to sell will be RM 160. The ROI of our product is in 5 months. We would like to commercialize our product through social media's such as Facebook, Instagram and Twitter.

# APD (Automated Pes Detection) Helps To Increase The Agriculture Result Of Farmers

Grahita Ceysar Pestalozy, Abdul Aziz, Ido Jamal Rizki Lubis, Lanang Adhi, Ahmad Rafie, Yan Surono

MA PPMI Assalaam, Indonesia Scientific Society

**Abstract -** Food security is a condition of fulfilling food for households as reflected in the availability of sufficient food, both in quantity and quality, safe, equitable, and affordable. Efforts to achieve food security are highly dependent on the level of productivity of rice plants as the most needed type of food crop in Indonesia. The mission to increase rice productivity in its implementation encountered many obstacles. Therefore, we took the initiative to create a tool that allows to solve problems that are very disturbing for farmers, especially in the problem of productivity of rice plants in the form of pests, especially planthoppers. Thus, rice productivity increases as well as farmers get more profit than not using the tool at all. The method we use in making this "Automade Pest Detection" is by using several references, one of which is from a study entitled "Control of Locusts (Locusta migratoria) using Ultrasonic Waves in West Kalimantan" published by Stepanus Sahala in a Tanjungpura University Research Journal. Volume IX No. January 1, 2008. We also conducted a direct experiment in the field to test the efficiency of the tool. The way the tool we will make works is by using ultrasonic waves as a means to repel pests. so that by itself the planthopper will stay away from the environment affected by the wave. This tool can also detect pests in the fields. and the detection results can be monitored via an application on a smartphone. In addition, APD (Automatic Pest Detection) is equipped with PIR and PING sensors. The use of these sensors is to detect the distance of pests from the tool. In addition, these sensors can detect using infrared light. So, "Automade Pest Detection" is a tool that uses ultrasonic waves to detect and repel pests and we can see the results through an application on a smartphone.

Keyword: Automade Pest Detection, rice productivity, planthopper

# MIC MOP

Woo Keh Han, Kua Yan Hao, Wang Zhi Xin, Teo Zhe Ying

SJK C Chukai Kemaman

**Abstract -** Stress is a serious problem in our life. So we need prevent it from hurting us. Prevention is better than cure. Hence, stress needs to be flushed out from our body from time to time. How can be reduce stress? Doing physical work is one good way of distressing. Physical work does not only mean exercising. It can also be cleaning the house, moving the lawn, washing the cars and watering the plants. Another way of distressing is to entertain yourself. Listening to or singing songs, playing games or watching your favourite movies can enhance your mood. Knowing these effective ways of destressing we have invented the MIC MOP, a destressing tool that combine physical work and entertainment together. This MIC MOP allows you to move, clean and enjoy at the same time, providing another level of destressing experiences.

Keyword:  mic, mop , relax , reduce stress

## Optimization of Bio-Oil and Biochar from Pyrolysis of Upakara Waste as Energy

Ni Kadek Karina Dewi, Komang Putri Marta Armayani, I Wayan Madiya, S.Pd., M.Pd

SMA Bali Mandara / Indonesia Scientific Society

*Abstract -* Ceremonial waste is one of the organic wasted not to be useful by the sociaty than only throw away especially in Bali Region. This research base on planty of ceremonial wasted after the Balinese ceremonial calendar that could harm the environmental if we dont care it wisely. This research is a type of experimental research in connection of pyrolysis process ceremonial waste in arccordance to liquid products (bio-oil) and solid charcoal (biochar). Pyrolysis is a heating process of biomass in reactor without oxygen. The purpose of this observation is 1) To analyze the impact of temperature and residence time toward pyrolysis prosses toward yield 2) To analyze the characteristic of yield produced by pyrolysis process. 3) To analyze the potential of bio-oil and biochar substances as renewable energy. Technic of collecting data are by bservation, dokumentation and experiment. Collected data to be analyzed by using quantitative descriptive analysis method. The highest presented of bio-oil resulted on medium temperature with the flowers ingredient result 8,75%. While residence time that result the highgest bio-oil is one hour. This observation shows that they are connection of between heating temperature and residence time with toward bio-oil and biochar produce by pyrolysis prosses. Bio-oil and biochar are pontentially to help the country energy. As bio-oil could usefull for gasoline to replace diesel oil (solar fuel) and the chemical contain as phenol chould usefull for farmation industry. Biochar that to be ussefull for biopasta to replace coal biopellete and for soil to plant the plantation which is fertile for plants.

Keywords : Ceremonial wasted, Pyrolysis, Bio-Oil and Biochar, Renewable energy.

## ARIES - A Concept to be a Solution for Global Warming, Energy Saving and AC Filter Efficiency

Ramani Gopal, Avinaash Ramani

Sekolah Menengah Kebangsaan Kulim

*Abstract -* The name of our design is ARIES. It means arduino in energy saving. For lots of us, keeping your room at a comfortable temperature is safer than battling the heat on your own, especially for kids like and the elders. Thus, with the usage of the air conditioning, we need to make sure the filter are well maintained to ensure energy efficient and reduce in climate change. For many of us, changing air filters is an easily forgettable chore. So, wouldn't it be great if your air filter could alert you when it became clogged and lost its efficiency? Now it can with our invention named ARIES. We have used arduino for our invention is to detect and monitor of air conditioner filter efficiencies and performance and sustainability (objective) - reduce the consumption of current - improve the efficiency of a/c filter - reduce the electricity bill - reduce the greenhouse gases-global warming (market potential) - every house has one or more ac in use - aircond is been used world wide - able to save up to 30% of mnc compony electric bill (industrial advantages) - reduce downtime - preventive maintenance managing more efficient - energy saving (household advantage) - reduce electricity bill - reduce man power.

# Formulation of Cassava Leaves (Manihot esculenta) Substituted Onion (Eleutherine bulbosa) in Candy Jelly for Improving Fiber and Antioxidant Immune System

Resti Isnani Rahma Amalia, Argalita Restu Wigasantri, Brahita Adilla Diva Kusmala, Hestin Wirasti

MAN 2 Kebumen / Indonesia Scientific Society

*Abstract -* Candy is a practical food favored by the community. During the Covid pandemic like now candy is the right choice to increase immune power. The innovation of jelly candy which is the result of substituting cassava leaves and Dayak onions is the solution offered by the author. Cassava leaves have many benefits because they are natural and contain useful ingredients for human health. Cassava leaves contain fiber and several important nutrients such as protein, fat, carbohydrates, vitamins A, C, B 17, and minerals such as calcium, phosphorus, iron and are rich in fiber. While Dayak onions have high antioxidants and are usually used to treat cancer, heart disease, anti-inflammatory, anti-bleeding and to increase immunity or the immune system. This study aims to determine the formula of dayak substituted cassava leaf jelly candy that panelists like and to determine the organoleptic test results of the cassava leaf jelly candy substituted by Dayak onion. The research stage starts from the preparation stage, the manufacturing stage, and the testing stage. The formulas of candies A, B, and C have ratios of cassava leaves and Dayak onions, respectively 1: 2, 1: 1 and 2: 1. The organoleptic test of jelly candy includes taste, texture, aroma and color. Based on the results of the organoleptic test, candy A with a ratio of 1: 2 had the highest value. This shows that candy A with a formulation of the ratio of Dayak onions and cassava leaves 1: 1 is preferred by the panelists.

Keywords: Candy, Cassava Leaves, Dayak Onions, Organoleptic Test

# BAKULIS: Airspray Solution from Jeruk Limau Peel Waste (Citrus amblycarpa) and Lemongrass (Cymbopogon citratus) as Natural Larvicide in Preventing Dengue Hemorrhagic Fever

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*Abstract -* Background: Dengue hemorrhagic fever (DHF) is caused by a dengue virus that spreads through the bite of the Aedes aegypti mosquito, which breeds a lot in densely populated areas humid and warm climates. Anti-mosquito drugs in the form of burns, sprays, lotions, or other types are already widely used, but these anti-mosquito drugs are not entirely beneficial. Method: This research is purely experimental research with Post-test Only Control Group Design by making airspray solution products from Jeruk limau peel waste and lemongrass, which are analyzed descriptively and analytically. Experiments carried out with Randomized Complete Design three times repetition to analyze effectiveness. The study used two factors: experimental group (P) using product while the control group (K) using aquades. Besides, we used the hedonic organoleptic test for measuring public preference of this product. Results and Discussion: All respondents liked the product, both in terms of aroma, color, texture, and packaging. From the results of mixing, obtained in each measurement there was a reduction in live larvae until 3 hours, all larvae died. Jeruk limau peel waste and lemongrass contains flavonoid compounds as respiratory poisons and a combination of saponins and tannins as stomach poisons that have the killing power against the death of Aedes aegypti larvae. This makes a change in the larvae's behavior, where the previously active movement will be slow and eventually will die. Conclusion: This product has good selling power and effectiveness in handling DHF by utilizing easily available waste and natural materials to enrich local treasures and of course in realizing the third point of the Sustainable Development Goals.

Keyword: DHF, jeruk limau, lemongrass, airspray solution, larvicide.

# HSP (Hydroponic Solar Pump) An Innovative Use of Leftover Food as Fish Feed by Utilizing Renewable Energy Sources

Nabila Aisyah Az Zahra, Hanifah Putri Widodo, Athiyya Zahrah Faiha Ramadhani, Aliya Aisyah Az Zahra, Yan Surono

MA PPMI ASSALAAM / Indonesia Scientific Society

*Abstract -* Food waste has become global issues and a concern of various institutions food security in recent years. In an effort to the use of food waste to be a source of food for pond fish have been done in some places in indonesia, one of them is in Assalaam Islamic Modern Boarding School Sukoharjo. In the use of trash food as consumption of pond fish, we have innovated to add hydroponic plants as water purifiers in the pond. So there will be more benefits of the pond by obtaining fish and vegetables at once so there will be more profit for the farmers. The objectives of our research is to make Hydroponic Solar Pump (HSP) with solar panels as a source of energy distributor of plants nutrition and water pond purifiers as utilization of food waste. This device also can be used as an alternative to resove the problem of energy limitations in agricultural technology. HSP ( Hydroponic Solar Pump ) testing would be conducted by research methodology experimental and to test the device in Assalaam fish ponds. We have designed a water circulation regulator of hydroponic planting system by using solar panels as the converter of sunlight energy, we would use Solar Charger Controller as a regulator to balance the electric currents, battery as a storage for electrical energy produced by solar panels, and hydroponic pump as a motor of pond water circulation that could operate for 24 hours non stop. This activity is expected to produce a prototype of hydroponic technology based on solar energy so that it could become a role model of agropolitan through school. +So, HSP (Hydroponic Solar Pump) is a tool to achieve efficiency in innovating the use of food waste by using renewable energy sources. As a result, productivity of fish and vegetable farming will increase.

Key words : Food waste, solar panels, hydroponic

# SPIKESAW

Ikmal Syahmee Bin Ma'Som, Mohamad Nashrul Zhaqef Bin Zalani, Muhammad Hafiz Bin Alias,
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Sekolah Menengah Sains Johor

*Abstract -* Oil palm cultivation in Malaysia has been introduced by the government to eradicate poverty in the rural population. In the 1960s, the Federal Land Development Authority (FELDA) opened up new lands to be explored and made oil palm plantations. The development in the oil palm industries is very encouraging with the emphasis given to them to look for new methods in cultivation technology, seed production, and production of new oil palm products. The Malaysian Department of Agriculture, established in 1912, is tasked with agricultural policies that have been outlined by the government. The Federal Land Development Authority (FELDA) is also established to coordinate the opening of new lands. The Palm Oil Research Institute of Malaysia (PORIM) also serves to provide greater development and research (R&D) efforts. The Malaysian Palm Oil Board (MPOB) also plays an important role in promoting and introducing the benefits and the uses of palm oil worldwide. As one of the largest exporters of palm oil in the world, the country's ability in fulfilling the demand of the world market is also very much related to the productivity of the oil palm plantation operators, most of whom are smallholders or settlers. Our study is based on observations of plantation workers in oil palm plantations. From our observations, they have a problem lifting the oil palms into the truck. The average weight of oil palm is about 10 to 20 kg. Thus, they need a lot of energy consumption and take a lot of time to lift them one by one. The main objective of our product is to help the plantation workers to transport the oil palm easily and effectively in addition to increase work productivity. Using the principle of the lever, we will apply the fulcrum at the center of the product and will help the workers to use a little force for lifting a heavy load. Our product is lightweight and portable, so it is easier for the consumer to use. Furthermore, our product emphasizes the concept of eco-friendly as it does not use fuel or electricity.

# Wholle Scooter

Zulfahmi Bin Muhammad, Muhammad Muzakkir Bin Mohd Affandi, Farhan Hazmi Bin Roslli,
Muhammad Aidil Hakimi Bin Saiful Hazmi, Mirza Imran Bin Baharin

Sekolah Menengah Sains Johor

*Abstract -* Nowadays,mobility is a need towards the society. An estimated 19 million people (10.1%) were reported facing mobility difficulty around the world.This difficulty is mostly faced by senior citizens globally especially during their daily activities. There were 703 million people aged 65 years or over in the world in 2019. The number of older persons is projected to double to 1.5 billion in 2050.Therefore,we cannot let this difficulty to keep on going for the future.The issue rises when senior citizens start to face muscle weakness and joint problems which lead to mobility problems including difficulty of walking and moving.Eventhough walking sticks were invented to overcome this problem,the problem still rises.This aging issue also causes difficulty in lifting heavy loads.Considering this issue,we have decided to introduce the 'Wholle Scooter' .This scooter was designed to ensure that style, comfort and physical activity were all incorporated in its function. The prototype features a design similar to that of a suitcase, with a padded front compartment that can hold groceries and the user's personal belongings. The design has two large wheels and one smaller one, and the scooter part of the product can be snapped up when it is not in use. When users do not want to exert too much energy, the scooter has an optional seat and electric power mode that relieves potential strain.The objective of our product is to help senior citizens tu undergo their daily lives without any aging issues preventing them to do so.This product is designed modernly because it can move automatically without using an indiviual's energy and at the same time can carry belongings in the front compartment provided.This product is beneficial towards the society because it does not cause air pollution as it uses electrical energy to mobilise.It also mainly helps the user to bring heavy loads despite the senior citizen's health issues whereas they cannot lift heavy items.Besides,the cost for it to move is not as expensive as fuel because it uses electrical energy and can prevent the user to get stuck in traffic jams.The most significant benefit of this product is it helps a senior citizen to maintain a healthy lifestyle without tiring themselves.In a nutshell,the 'Wholle Scooter' can brighten the future of the society.

# Utilizing Servers to Create a PVE Environment

Rahul Sachdev A/L Sharad Kumar, Aida Zamnah Binti Zainal Abidin, Sharizal Pujahaas Bin Jaffar

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*Abstract* - Over the years, gaming has become one of the most popular trends among children, teenagers and even adults. It is one of the best forms of entertainment for the people. Besides that, gaming has also evolved from being something with low graphics quality and basic shapes as characters into an era of online connection live character gameplay. With servers being used as a base for online gaming. However, when it comes to utilizing servers especially for the inexperienced programmers, they tend to implement photon as a server host for their games. It is better to implement and program a server with your own program in charge as it can be optimized better and handled much easier. Although it requires more effort it will be very beneficial in terms of optimization, understanding and control with the help of TCP and UDP clients on your server. Games have also evolved in such a way where it is now able to support artificial intelligence based characters and gameplay. However, it has been proven that it is a great challenge for developers to create and maintain servers and artificial intelligence in their games, and it's also very difficult for junior game developers to understand. Developers tend to overlook their AI design and its flaws. Hence, this game allows deeper understanding on how to create and operate an AI based online game with a self created server as a means for online connection. When AI and servers are put together it can place a heavy burden on the load of the hardware used. By maintaining a proper use of the TCP and UDP protocols, it can also help to reduce the stress on the hardware. Therefore, this method of usage will be carefully applied in the programming of the protocols. With the current pandemic, modifying servers to allow for proper entertainment for the people in order to provide more enjoyment during this time. As most extroverts need a form of entertainment as they are unable to leave their respected homes.

# Multiple-eMath

Tang Howe Eng, Imelia Laura Ak Daneil, Siti Faridah Bt Kamaruddin, Grace Lau Chui Ting

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*Abstract -* Multiple-eMath is created to provide a platform for the users to practice all kinds of mathematics equations in solving problem. These mathematics equations comprise trigonometric equation, logarithmic equation, equation with square root, equation with fraction, inequality equation, equation with factorial and exponential equation. The special feature of this product is its enrichment on the arithmetic operations based on BODMAS (bracket first, operation, division and multiplication, addition and subtraction) rule. The users have the experience to master the arithmetic operations of any form in a fun way. The users can get confused with all the operations symbols mean. The possible alternative solution is to let the users start from the basics, manipulating the operations so that everything can make sense to them. When they get to learn how to solve equations, they get to practice step-by-step solutions to their mathematics problems and the whole procedures to handle the problems. They can think of it like a puzzle and work hard to solve the puzzle. Multiple-eMath allows the users to get exposure on the solutions to all kinds of mathematics arithmetic operations problems, from the very fundamental to a complex form. The mastery of arithmetic operations skills can be significant predictor for the success in mathematics achievement. The novelty of this product includes the application of 21st century skills such as the mastery of critical and creative thinking skills.

# AP-Bag

Muhammad Akmal Bin Muhammad Redzuan Goo, Muizzuddin Bin Jamail, Muhammad Farish Hakimi Bin Fazri, Muhammad Amirul Aiman Bin Hj Maswan

Sekolah Menengah Sains Johor

*Abstract -* Studies show that most supermarkets in our country still using plastic bags to this day to store goods. Increased usage of plastic bags will have a negative impact on the environment. In general, plastics are non -biodegradable wastes that cannot be decomposed by microorganisms. So, the way to solve this problem, we have found an innovation which is AP-BAG (PORTABLE ADJUSTABLE CHART). This product is very attractive and makes it easy for everyone to use it regardless of age. The main purpose of this product is to control the use of plastic bags and make it easier for people to buy goods in the market without a problem. This bag is made of durable fabric and soft texture to make the user feel more comfortable and reduce the pressure. Cushions are placed within the bag to reduce the impulsive force when the item is placed to prevent the item from being damaged. Handles are placed on both sides to lighten the load while wearing them. The regulator is placed to adjust the bag according to shoulder height and human body measurements. Finally, this product includes a pair of Delrin clip. Among all the advantages such as the type of stretch fabric that provides comfort on the user's body and this bag is waterproof especially in rainy seasons. We hope that AP-BEG can attract modern marketing to use it in order to preserve and conserve the environment that is increasingly polluted simultaneously. Thus, the amount of plastic bag used in a daily life basis can be reduced.

# Smart Holder

Luqmanul Hakim Bin Nasruddin, Muhammad Zharif Anas Bin Ab Rahman, Muhammad Syahmi Bin Salman, Wan Muhammad Azri Afifi Bin Wan Muhammad Rumaizi

Sekolah Menengah Sains Johor

*Abstract -* In this millennial era, many technologies have been invented to ease and comfort our lives. The most common technology can even be seen in our house which are electrical equipment such as air-conditioner and refrigerator. But, the wide usage of some of these technologies are affecting the ozone layer, making it thinner, resulting in global warming. One of the effects is the rise of the earth's temperature. Thus, people tend to bring water using bottles most of the time, but sometimes they have no place to put the bottles and will put it on the ground or floor. This will make the bottles unnoticed by people and will damage the bottles if it is stepped or kicked unintentionally. To solve this problem, we have innovated a product, which is called the smart holder, which is a combination of a cylindrical holder and an adjustable mechanical stand. The objective of this product is to help people by providing suitable places to put their water bottles at anyplace and anytime to prevent any damage or dirt to their bottles. But, how is this product unique or innovative compared to other products in this category? Firstly, our Smart Holder is eco-friendly with no fuel and electrical usage. It is also high in mobility as it is small in size and light in weight. This product is also easy to use and can be repaired without having to spend an arm and a leg.By using this product, users can prevent their bottles from being damaged. Users will also save their money to repair the product as the materials and tools used to create it doesn't cost an arm and a leg.Waste , especially bottles can be reduced as people tend to reuse their bottles when it is still usable and not damaged. This product is also environmentally friendly as it has no electrical and fuel usage, which will not harm the environment.

# Q-FITPACK

Muhammad Firdaus Bin Mohd Sulaiman, Muhammad Izz Haziq Bin Aziz, Muhammad Izzat Hafizuddin Bin Kamal, Muhammad Fadzli Bin Atan, Muhammad Aiman Bin Yunus

Sekolah Menengah Sains Johor

*Abstract* - This project inspired by the counter of the skipping rope that placed at the handle of the skipping rope. This project is made by using the yoga mat and push up board to count it. The counter start function when there is an impact on the touch sensor. With this ability of sensor, users need to jump with the right method. Its because they need to give their full impact on the sensor to make it count. If the sensor did not get enough impact, the counter cannot function. It is more usefull because they just need to look at the board to see how many jump have been perform.Other than that, there also have push up board on the other side. So in the time, they can choose either to do workout such as wide chest bumping or to do skipping. Its clearly shown that they did not bound in just one activity, they can choose to perform each of it.Plus, with the presence of this project, it can courage the users more to do some activities even at their home. Besides they also can save their own money to go to the gym.As a deduction, this project can substitute the original product that is located at the handle due to its pros and cons. It also has its own durability that can withstand the impact from the users body and it momentum. It obviously shown that this project is the other innovation of the product that obtain so much use.

# CSBPcrete

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*Abstract -* Production of fresh concrete from batching plants is increase consistently in line with the development of construction projects. Project manager in construction industries prefered to use ready-mix concrete as one of the supplied materials for their projects. Inappropriately, more than 8 tons of fresh concrete turned to be wasted and returned to the batching plants. Furthermore, most of the batching plants management personnel will dispose the concrete waste in the sludge pit at the batching plant or discharging them at the landfill. To improve the waste management system of the concrete sludge, this research is aims in comparing the strength response to the contribution of Concrete Sludge of Batching Plant (CSBP) as recycled materials and additives in the manufacturing of concrete. With the intention of, the leftover concrete is invented to produce CSBPcrete as a new concrete mix design. In this study, the different replacement levels in percentage of CSBP which are 0%, 10% and 20% to cement weight were implemented. The result shown that the compressive strength of the CSBPcrete with 20% cement replacement is observed to gain the strength comparable than those of control sample. The selection of suitable methods of recycling the waste concrete sludge from batching plant can save and enhance the sustainability of the overall environment and affect society positively. Therefore, CSBPcrete can be used as the potential of recycled material in the conventional concrete to support the green and sustainable approach in construction industries and to solve the issues of overloaded concrete sludge produce by batching plant.

# BrellaBag

Muhammad Faiz bin Azhar, Muhammad Aminuddin bin Solihin, Muhammad Daniel bin Shukor, Muhammad Aliffuddin bin Hasni

Sekolah Menengah Sains Johor

*Abstract* - Rain happens everywhere and anytime in this earth especially in Malaysia that has a uniform temperature, high humidity and a lot of rain. Sometimes people bring many stuff in their hands and could not hold an umbrella when it is raining. For a disabled person who have no hands, they can't even hold anything including an umbrella and it becomes hard for them when it is raining. In addition, rain also can occur suddenly and it becomes a problem for those who didn't bring an umbrella. To overcome this problem, we decided to introduce the 'BrellaBag'. This product is to help people to solve the problems above. 'BrellaBag' is a combination between bag and umbrella. The umbrella is placed on the right side of the bag and people don't have to bring an umbrella if they using this product because an umbrella is already on the product. To use the umbrella, a button the left side of the bag must be clicked and the umbrella will opens itself. By pulling a string on the right side of the bag, the umbrella will be closed. The objective of this product is to help someone to reduce the burden on their hands and could avoid tired hands, they don't need to carry an umbrella by their hand anymore. Helping disabled people who have no hands to use an umbrella is also an objective to this product. This product is beneficial towards the society because it does not cause any pollution as it is not a disposable product and can be made by using recycled products. 'BrellaBag' can prevent a person from getting wet and can carry more items when it is raining. 'BrellaBag' is also can be used on a sunny day to avoid sunlight. In a nutshell, 'BrellaBag' is a great product to the society.

# Project-Based Learning in Architectural Design 6: Applications of Connectivism

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*Abstract* - This study examines the experiences of students and teachers of Architectural Design 6 in the pre-pandemic and current pandemic periods. This analysis focuses on the applications of the Theory of Connectivism in the instructional pedagogy of Project-Based Learning. It seeks to understand the effects of online learning in a practice-oriented, studio-intensive course of architectural design. This study draws on mixed methods of multiple case studies, demographic data, surveys of online learning that magnifies the effects of the internet, technology, and social connections in education. The challenges found in online learning were technological and personal difficulties. In both eras, similar technologies were used to exchange ideas of students and teachers. Expectations of the tangible products of learning, regardless of the learning modality, were the same – high grades, improve performance, gain mastery and attain course objectives. Noticeably though, students lowered their expectations to merely survive and pass the course. On a lighter note, teachers expressed optimism and hoped that they were able to continue education. Both students and teachers count on the information and inspiration from their online resources and networks, consistent with the Theory of Connectivism.

# ULAMs: University Location Attendance Management System

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Universiti Putra Malaysia

*Abstract* - ULAMs which is abbreviated from University Location Attendance Management System is a mobile app-based attendance tracker using which leverage indoor positioning technology based on Wireless Local Area Network to accurately locate the attendees (lecturer and students) in every specific classroom. Traditional paper-based attendance taking are inefficient, time-consuming, and resource wasting. In ULAMs, the attendance of students inside the classroom of each course is automatically recorded by the app and stored in the university academic management portal. The invention is the Location Based Attendance tracking system for university teaching and learning. Novelty of the invention is the capability to track the user in indoor location accurately using WLAN technology. Current technology is unable to locate specific user in indoor location such as classroom accurately. ULAMs applies the WLAN signal coverage theory which removes the limitation by current GPS technology which could not be used for indoor location tracking. The technology is environmentally friendly as it leverages the usage of on-the-shelf Wi-Fi access point that is readily available in the many premises for internet connectivity. Some advantages of ULAMs includes zero paper usage attendance management, can track the attendance not only in classroom but also any other place if internet connection is available, real-time attendance reporting to university's administration and management, and can be directly linked to Student's Management Portal and Staff's Management System. In terms of market potential, it is suitable for attendance management for any type and any size of organization includes small community such as small-medium enterprise, and casual event organization, medium-size community such as schools, and neighborhood, and big community such as colleges, university, and large manufacturing plant, concert, and sports event crowd management.

# Grit to Great: Development of a Model to Enhance Students' Oral Presentation Performance

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*Abstract* - Effective communication skills at the workplace are acknowledged as a highly sought skill by employers among university students. However, many reports indicated a mismatch between employers' expectations and students' actual communication skills. An imperative subset of communication skills is oral presentation skills, which are found to be unsatisfactory among students. To shed light on this issue, this study examines the emerging role of grit in the context of oral presentations in classrooms. Grit is a characteristic that has been gaining recognition as a predictor of students' academic achievement. However, the potential impact of grit on students' oral presentation performance has not previously been analysed and quantified. Therefore, this study merges the theory of planned behaviour and grit theory to develop a model that will allow us to pinpoint the influence of grit in impacting students' oral presentation performance. The central question that this model aims to answer is whether grit influences students' oral presentation performance which a novelty as grit is will be examined as a moderator which has been sorely lacking in the literature. Another novelty is that this model is developed and validated using serial mediation analysis, contributing to more conclusive statistical analysis and interpretation. Thus, this model is comprehensive as it examines the moderating and mediating effects of seven constructs including grit on students' oral presentation performance. The model can guide educators and universities to understand the extent of the influence of grit in classrooms and in fostering students' proficiency in the four language skills. This model would also encourage the government and universities to take grit seriously as students' ability to be gritty is crucial for talent to transform into a skill that leads students to success.

# Student Industrial Attachment during Pandemic Era: An Implementation Framework for Universities

Kasmarini Baharuddin, A'dillah Mustafa, Siti Nurul Maryam Abdullah, Suriana Che Daud, Nor Zaina Zaharah Mohamad Ariff

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*Abstract* - Student industrial attachment has been an integral component in most academic programs. The values held by this component provide the student with a work-based exposure which valuable to their continuous professional development. The work-based exposure complemented the classroom-based learning in producing industry-ready graduates. Unfortunately, the COVID-19 pandemic outbreak has affected the industrial attachment process and implementation. Consequently, several gaps in the industrial attachment implementation have been identified. Earlier studies, observations, and empirical evidence revealed that mode of implementation, duration of studies, assessment, and environment are the most significant factors affecting the quality of graduates and employability. Therefore, this study suggests the Student Industrial Attachment during Pandemic Era: An Implementation Framework for Universities as an effort to provide a possible solution to the above-mentioned impediments. The framework aims to provide a comprehensive guide to universities' authority in planning and implementation of the industrial attachment in terms of execution, time frame, appraisal, as well as resources and facilities. As we are still living in the pandemic, this framework is believed to be the first and original designed for universities to be adopted and adapted widely. Additionally, this framework has a great potential to be flexibly used in any pandemic circumstances. The framework will benefit universities and societies in providing guidelines in managing academic programs, monitoring student industrial attachment achievement, together with preparation for adequate resources (technology, financial, ambiance).

Keywords: Industrial attachment, COVID-19, pandemic, framework, implementation

# EzMathz

Goh Kok Ming, Dr. Khuan Wai Bing

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*Abstract* - The Computer Algebra Systems (CAS) such as Mathematica, Maple, MuPAD, MathCAD have potential to facilitate an active approach to learning, to allow students to become involved in discovery and to consolidate their own knowledge, thus developing conceptual and geometrical understanding and a deeper approach to learning. Emergence of such mathematical tools and its ability to deal with most of the undergraduate mathematics cannot be ignored by mathematics educators. We believe that mathematics teaching can be made much more interesting, inventive and exploratory using Ino-M: 3D Shapes. The Ino-M: 3D Shapes is mathematical apps that uses Android interfaces that makes it extremely easy to explore, visualize, and solve mathematical problems. It brings technology into mathematics education and brings the benefits of mathematical software development to the classroom and into the hands of teachers and students. With Ino-M: 3D Shapes, students are not forced to choose between mathematical power and usability, making it the ideal tool for education. The respondents were chosen based on the document analysis and the diagnostic test. The respondents were 4 boys and one girl. The Pre-test, Post-test, observations and 3 topical exercises were the instruments used to collect data. The data collected was presented in the form of table, graph and percentage. The results showed that the application of Ino-M: 3D Shapes was success in assisting the respondents to learn the mathematics concept especially during this school closures.

# Note-in-Poster Framework

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Universiti Teknologi MARA Cawangan Negeri Sembilan

*Abstract* - NiP is an acronym for Note-in-Poster. It contains a one –page comprehensive and interactive note which explains a specific learning content. It is different from other short notes as its development is based on the VAK Learning Style Model which considers students' different learning styles namely visual, auditory and kinaesthetic. Therefore, NiP has several special features: (1) the note is presented in the form of text and graphics to support visual learners who learn by seeing; (2) the note is presented in the form of audio to support auditory learners who learn by hearing; and (3) several links are provided to support kinaesthetic learners who learn by doing. The main purpose of developing NiP is to provide a comprehensive note that can engage students with different learning styles in learning. Another purpose of NiP is to a bite-size learning note so that they are not overwhelmed with long notes. To guide the design and development of NiP, a framework named as the NiP Framework is developed

# ProM3 Rubric and Task: Assessment of Students' Mathematical Process Skills

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*Abstract* - ProM3 rubric and task were developed to measure students' mathematical process skills. The lack of incorporating of this skills could disrupt the students' performance in a wider context of Mathematics. Previous studies used qualitative method to observed students' skills toward mathematical process. Although those methods give deep understanding to researcher, but it can't be expanded to larger scale research to give more information regarding students' mathematical process skills. This study used ADDIE's model involves analysis, design, development, implementation and evaluation phase. There are 407 Form One students involved as research samples. Students' responses in tasks were scored by seven raters based on developed rubric towards five dimensions of mathematical process namely connection, representation, communication, reasoning and problem solving. The results of the evaluation analysis by nine experts showed that the task and rubric had high content validity, and also indicates good construct validity based on the many-facet Rasch model (MFRM) analysis. Dimensionality analysis showed that the rubrics explained 50.40% of the variance. Rubric also showed good item reliability (0.99) and the inter-rater agreements (48.7%). Variable map showed that the respondents were divided into four levels of mathematical process skills; Excellent group (2.46%), Good (41.77%), Average (52.5%) and Weak (3.19%). In conclusion, the developed rubric had good psychometric characteristics in measuring students' mathematical process skills. The ProM3 task is a modification to common mathematical problem solving, with addition of reflective writing task instruction based on Kolb Reflective model to encourage students thinking mathematically. Use of ProM3 rubrics with 29 criteria of 5 dimensions to evaluate students' mathematical process skills with item, raters and response validity reviews based on Rasch model analysis, provide empirical data for reference and further actions. The findings of this study allow interventions planned with emphasis on criteria that have not been mastered by students. ProM3 task and rubric can be used as classroom assessment tools to track students' improvement, and also as practice. This implicates that the use of the instrument can be extended to other categories of secondary school students and can be used as a model to measure the same skills for different topics.

# M-HEUTAGOGY: Promoting Learner Autonomy in Preparation for the Fourth Industrial Revolution Challenges

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Universiti Pendidikan Sultan Idris

*Abstract* - The Fourth Industrial Revolution (IR4.0) has impacted higher education. Revolution is a concept that spreads the Internet of Things (IoT), Big Data, artificial intelligence, social media, and robotics. Thus, technology will gradually replace the human workforce through machines, robots, and Internet applications in business and manufacturing. Since the revolution began to occur in daily life, especially in the future, Higher Education Institutions (HEIs) need to develop quality human capital with tacit knowledge to apply in the workplace. Furthermore, the rapid evolution and spread of technology influences the delivery of education and influences learners' learning experience. HEIs should include Information and Communication Technology (ICT) and a flexible learning environment for learners to explore learning at their own pace. Thereafter, technology and learning approaches should be optimized and consolidated, especially during the Covid19 pandemic. However, without an appropriate learning approach that provides an adequate cultural context in planning and selecting appropriate learning activities and e-learning tools while using mobile technology in hybrid learning, the teaching and learning process will be chaotic and confusing. Therefore, there is a need for appropriate heutagogical approaches to be introduced to educators to be applied in hybrid teaching and learning. Doing so aims to instil learner autonomy and increase motivation among learners for lifelong learning, which learners can learn anywhere and anytime. Thus, the integration of heutagogy and technology has indirectly created a learning environment that adheres to the Mobile Heutagogy (M-Heutagogy) approach. M-Heutagogy is self-determined learning using Web 2.0 technologies and applications. The objectives of the M-Heutagogy are to promote learner autonomy in preparing learners for the challenges of the Industrial Revolution 4.0, and to solve problems that arise when schools and institutions have to close to reduce movement under the Movement Control Order (MCO) in Malaysia. The novelty of M-Heutagogy lies in its design that focuses on the formation of learner autonomy and learner learning style in influencing learners to use M-Heutagogy. M-Heutagogy is useful in helping educators improve the quality of T&L by planning and creating meaningful activities and using instructional technology as it is unique, interactives, borderless, affordable and easy to use. As a result, learners will benefit fully from M-Heutagogy regarding autonomy, feedback, and interaction with peers and teachers. Besides, M-Heutagogy can produce a knowledgeable society that guarantees the future of the country. M-Heutagogy has great potential to be commercialized to drive improved technology-based learning approaches such as flipped learning, distance learning, e-learning, and 21st-century learning.

# The Perfect 10 - Travel Kit Exclusive

Norzaidah binti Ngali, Norazlina binti Rahmat, Noorazlin binti Ramli, Fatimah binti Abd Ghani

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*Abstract* - The Perfect-10 Kit: Post Pandemic Travel Essential Norzaidah Ngali Norazlina Rahmat Noorazlin Ramli Fatimah Abd Ghani Universiti Teknologi MARA Cawangan Terengganu Kampus Dungun norza319@uitm.edu.my ABSTRACT The Perfect-10 Kit has been created as a significant product that impact public health and safety in reinforcing the self-assurance ease of feeling during post-pandemic travel. This travel kit is packed with 10 items which includes COVID-19 protector's items such as disposable face mask, hand sanitizer and thermometer strip. Additionally, personal and hygiene travel items such as antibacterial wet wipes, toothbrush and toothpaste, body wash and shampoo, sanitary pad, ointment, sunscreen lotion and essential pills for fever and motion sickness are included to complete and organize your personal items while travelling. The Perfect-10 Kit has been created to provide a greater peace of mind among travellers because in response to the fact that even though most people are not ready to travel yet, they will eventually want to be prepared by taking personal measures to reduce the infection rate in the new normal due to pandemic COVID-19. There are three major unique innovation of the products. First, The Perfect-10 Kit is the one and only travel kits which includes Covid-19 essential product (disposable face mask, hand sanitizer and thermometer strip) and hygiene product for travel in one bag. Next, it is water-resistant material, making it safe to be use in many situation and environments. Lastly, it is designated with multiple pockets for storage convenience with sturdy handle for carrying ease and its hanging ability. This project fit the Sustainable Development Goals (SDGs) with collaboration from Pusat Pemulihan Dalam Komuniti (PPDK) Wakaf Tapai which supports the commercialization of this product as an impulse item during travel that led to the sustainability of heritage, social and economic with local community. Key Words: travel kit, COVID-19, hygiene, safety, and post-pandemic travel

# Let's Play Dam Gramm

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*Abstract* - This innovation product aims to help primary school students master grammatical aspects such as tenses, antonyms, synonyms, collective nouns and verbs. 'Let's Play Dam Gramm' means that students master grammar skills through the famous traditional game named 'Dam Haji'. Moreover, there are related questions about the grammar in the form of Google Form. Prior to producing this innovation, we found that students were not interested in learning aspects of grammar. Grammar is a very important element in the process of learning English Languages. However, pupils often get a low score in grammar parts. The research shows that most of the pupils prefer to learn grammar through games. Therefore, our group produces a set of grammar games by modifying the famous traditional game called 'Dam Haj' and named it 'Let's Play Dam Gramm'. This game set was created by using plastic bottles and card board. Indirectly, this game set creates awareness among students on how to preserve the environment through the recycling process. The 'Let's Play Dam Gramm' set of games also contains grammar modules and there are quizzes in the form of 'Google Form' as an enrichment activity. This intervention was implemented to nine respondents from SJK (TAMIL) Air Kuning Selatan, Gemencheh, Negeri Sembilan. Quantitatively collected data is through pre-test, post-test, and document research and analyzed using percentages while qualitatively collected data is through observations and interviews. The findings show that the learning through playing facilitates students to quickly dominate the grammatical aspects and remains in memory of a long time. Scores of pupils have also increased in post-test after using 'Let's Play Dam Gramm'. This study can be implemented to students who are experiencing the same problem by modifying the game to the level of a student.

# The Miracle Tray

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*Abstract* - The Miracle Tray draws out cold form frozen food to defrost in minutes. The Miracle Tray improves food preparation safety by incorporating a medical grade germicidal UV lamp. To eradicate germs and bacteria.