MNNF NETWORK

PROGRAMME & ABSTRACT BOOK

INTERNATIONAL INNOVATIVE & CREATIVE IDEAS POSTER COMPETITION

IICIPC 2025

20 SEPTEMBER 2025

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INTERNATIONAL INNOVATIVE & CREATIVE IDEAS POSTER COMPETITION

IICIPC 2025

CONTENT

DIRECTOR'S MESSAGE

Greetings!

It is my great pleasure to welcome all participants to the *International Innovative & Creative Ideas Poster Competition (IICIPC 2025)*. I extend my sincere gratitude to each of you for your dedication, creativity, and effort in making this event a success.

This competition provides a valuable platform for sharing research and innovation in a clear, impactful, and visually engaging format. This year, we are proud to feature 107 posters from Malaysia, Thailand, and Indonesia, carefully evaluated by a distinguished panel of 36 judges, each an expert in their respective fields. To ensure fairness, every project was reviewed by two judges.

Congratulations to all the award recipients! For those who did not receive a Diamond or Gold award this time, I encourage you to view this experience as a valuable step in your journey. Every competition is an opportunity to learn, grow, and refine your ideas. What truly sets you apart is not only your achievement but also your resilience, curiosity, and commitment to continuous improvement.

I look forward to seeing your innovative ideas shine once again in the next IICIPC series.

With warm regards,
Nadzri Salleh

LIST OF JURIES

LIST OF JURIES

Assoc. Prof. ChM. Dr. Sazlinda Kamaruzaman
Universiti Putra Malaysia

Assoc. Prof. Dr. Nurazilah Zainal
Universiti Teknologi MARA

Asst. Prof. Dr. Yeo Sook Fern
Multimedia University

Asst. Prof. Ranu Iskandar
Universitas Negeri Semarang

Dr. Azmi Bin Ahmad
Politeknik Tun Syed Nasir Syed Ismail

Dr. Lee Boon Beng
Universiti Malaysia Perlis

Dr. Naila Erum
Universiti Teknologi MARA

Dr. Nik Noor Ashikin Bt Nik Ab Razak
Universiti Sains Malaysia

Dr. Nor Akmalazura Binti Jani
Universiti Teknologi MARA

Dr. Nurul Nadiah Binti Abd Razak
University of Malaya

Dr. Rahizana Binti Mohd Ibrahim
Politeknik Tun Syed Nasir Syed Ismail

Dr. Rayner Bin Tangkui
Institute of Teacher Education Keningau Campus

Dr. Sharfizie Bt Mohd Sharip
Universiti Teknologi MARA

Dr. Siti Munirah Mohd
Universiti Sains Islam Malaysia

LIST OF JURIES

Dr. Wan Elina Faradilla Wan Khalid

Universiti Teknologi MARA

Ts. Dr. Mohamed Hizam Mohamed Noor

Universiti Teknologi Malaysia

Kdr. Dr. Hani Kalsom Binti Hashim

Universiti Pertahanan Nasional Malaysia

Ts. Dr. Siti Fairuz Nurr Binti Sadikan

Universiti Teknologi MARA

Ts. Dr. Alia Amira Binti Abd Rahman

UniKL MIIT

Ts. Inv. Mohd Arzaimiruddin Ariffin

Universiti Teknologi MARA

Ts. Dr. Choong Chee Guan

Politeknik Tuanku Syed Sirajuddin

Ts. Mohammad Aizat Bin Basir

Universiti Malaysia Terengganu

Ts. Dr. Lim Hooi Peng

Politeknik Ibrahim Sultan

Ts. Yap Tek Hong

Politeknik Tuanku Syed Sirajuddin

Ts. Dr. Mohamad Asrofi Bin Muslim

ADTEC JTM Kuala Lumpur

Ir. Ts. Zulkarnain Bin Abdul Latiff

University Kuala Lumpur

LIST OF JURIES

Azman Bin Ariffin
Universiti Selangor

Juliana Hamka Binti Kamaroddin
Universiti Teknologi MARA

Muhammad Hasnun Bin Md Yusoff
Universiti Sains Malaysia

Muhammad Idil Bin Idris
Kolej Matrikulasi Kelantan

Najuwa Binti Abd Latip
Institut Kemahiran MARA Lumut

Nur Dalila Binti Abdullah
Politeknik Muadzam Shah

Saharuddin Bin Talib
Politeknik Banting Selangor

Sulaiman Bin Mahzan
Universiti Teknologi MARA

Dr. Suzana Binti Ahmad
Universiti Teknologi MARA

Suzana Binti Baharudin
Universiti Teknologi MARA

LIST OF WINNERS

Congratulations!

Congratulations!

DIAMOND AWARD

A1: Professional Science, Technology, Engineering & Mathematics (STEM)

Ref. No. & Project Title:

182 - IEWRA Application: Advancing Worker Safety through Innovative Indoor Environmental Risk Assessment in SMEs

Institution:

Universiti Malaysia Sarawak

Members:

Ts. Mohd Azrin Bin Mohd Said, Hillary Edry Anak Tagas, Dr. Nor Kamaliana Khamis & Aishah Arsad

B1: Professional Social Sciences & Humanities (SSH)

Ref. No. & Project Title:

143 - The Little Hydro Garden: Cultivating Environmental Awareness, Healthy Eating Habits and Moral Values among Preschool Children Through Hydroponics

Institution:

SJK(C) Perak

Members:

Yeow Pei Wen, Fong Kok Fei, Chong Hean Long, Choo Poi Kuan & Fun Yoke Ping

Congratulations!

DIAMOND AWARD

A2: Higher Institution Student Science, Technology, Engineering & Mathematics (STEM)

Ref. No. & Project Title:

167 - A Comparative Evaluation of Wind Turbine Blades with Flow Control Methods

Institution:

Universiti Sains Malaysia

Members:

Mohd Hafiz Ab Satar, Norizham Abdul Razak & Farzad Ismail

B2: Higher Institution Student Social Sciences & Humanities (SSH)

Ref. No. & Project Title:

119 - Servify

Institution:

Politeknik Tuanku Sultanah Bahiyah

Members:

Mohamad Darwisy Hafiy Bin Shamsul Fazli, Puteri Batrish Batrishsya Binti Jafri, Nur Aufa Nisa Binti Mohd Anuar Affendi, Suhas Varma A/L Daiva Selha Mani & Farizoh Binti Hamid

Congratulations!

DIAMOND AWARD

A3: School Student Science, Technology, Engineering & Mathematics (STEM)

Ref. No. & Project Title:

186 - 2-in-1 Robotic System for Patient Screening and Treatment Monitoring in Healthcare Facilities

Institution:

Triam Udom Suksa School of the Northeast

Members:

Arachaporn Seehapan, Thanadol Siribut, Thanthanet chaiyasuk & Malinee Keawkerdmee

B3: School Student Social Sciences & Humanities (SSH)

Ref. No. & Project Title:

196 - HI-AID

Institution:

SK Jeram Batu 20

Members:

Nur Mazida Binti Mazlan, Siti Zatusy Elyana Binti Mat Rashid, Atikah Binti Mohd Jajuli, Amni Binti Mohamad Iskandar, Nadia Binti Mohd Zamri & Wafa Nasuha Binti Mohd Fadzil

Congratulations!
LIST OF WINNERS

Science, Technology, Engineering & Mathematics (STEM)
A1: Professional

Ref. No.	Title	Institution	Award
182	IEWRA Application: Advancing Worker Safety through Innovative Indoor Environmental Risk Assessment in SMEs	Universiti Malaysia Sarawak	**DIAMOND**
158	SoWin AIoT: Smart Light, Smarter Energy	Politeknik Mersing Johor	**GOLD**
129	AquaNexus: Advanced Dive Mask with Hazard Detection and Fish ID	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**GOLD**
147	SAMUDERAMAPS: GIS-Driven Water Quality Mapping for Coastal Sustainability	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**GOLD**
165	Malaysian Crowdsourcing Platform (MCrowdTalent)	Universiti Teknologi MARA	**GOLD**
175	MenHea: Mental Health	Universiti Pertahanan Nasional Malaysia	**GOLD**
138	NeoFloat: Smart Innovative Life Jacket for Personal Water Safety and Emergency Rescue	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**GOLD**
142	FaceFits: A Face Shape Classification App for Hairstyle Selection and Recommendation	Universiti Teknologi MARA Terengganu	**GOLD**
128	AquaLove: Seawater-Activated Thermal Rescue Blanket for Marine Hypothermia Prevention	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**GOLD**
141	KitKePS (Kit Kebun Pendidikan Sekolah/School Educational Garden Kit)	Sekolah Kebangsaan Balun Bidai	**GOLD**
135	LumenTalk: An Advanced Integrated Light and Communication Mask for Safer Diving	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**GOLD**
179	Digital Extraction Optimisation Logbook: A Smart Data-Driven Tool for Herbal Research	Universiti Teknologi MARA & Universiti Teknologi Malaysia	**GOLD**
102	Innovative Mobility Solutions: Empowering Disabled Entrepreneurs with Smart 3-Wheel Bike	Universiti Malaysia Kelantan	**GOLD**
132	BioShield Paint: Biodegradable Anti-Biofouling Coating with Eco-Friendly Protection for Marine Life	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**GOLD**
133	Dagmar FE Bomb: A Compact Fire Suppression Grenade Revolutionizing Rapid Response in Enclosed Spaces	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**GOLD**

Congratulations! LIST OF WINNERS

CONTS..

Science, Technology, Engineering & Mathematics (STEM)

A1: Professional

Ref. No.	Title	Institution	Award
169	PredAlert: Automated Detection of Predatory Journals	University Poly-Tech Malaysia	**GOLD**
205	Web of Chaos	Kolej Vokasional Kuala Selangor	**GOLD**
136	MarGuard: Submersible Smart Gauntlet Distress Beacon and Personal Flotation Device	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**GOLD**
130	BeaconTech: Wearable Mini-EPIRB Wrist Unit	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**GOLD**
105	BELA-WANG	SK Abun Matu	**SILVER**
177	MyOneGov	Universiti Pertahanan Nasional Malaysia	**SILVER**
137	MarisSafe Watch: An Advanced Safety Watch Made for Open Water Divers in Emergency Situations	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**SILVER**
181	Stress Buddy	Universiti Pertahanan Nasional Malaysia	**SILVER**
134	EXO-Fin Leg Brace: A New Generation of Spring-Loaded Fins Enhancing Mobility for Weakened Legs Underwater	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**SILVER**
146	Longinate - Nature Reinforced, Waste Reimagined	University of Technology Sarawak	**SILVER**
215	Fitspin Wash	Sekolah Jenis Kebangsaan Tamil Port Dickson	**SILVER**
206	Enhancing Algebra Education Through Interactive and Innovative Tools: The Algebra Toolkit	Kolej Vokasional Kuala Selangor	**SILVER**
217	Network Pharmacology Made Simple: An Educational Innovation for Multi-Target Drug Discovery through a Bilingual Workbook and Course Module	Universiti Teknologi MARA & Universiti Teknologi Malaysia	**BRONZE**
139	The Deep: Self-Power Heated Swimsuit for Cold Resistance	Universiti Teknologi MARA, Perlis Branch, Arau Campus	**BRONZE**
173	Chemistree 2.0: A New Approach in Learning Chemistry	Universiti Malaysia Kelantan	**BRONZE**

Congratulations!

LIST OF WINNERS

Science, Technology, Engineering & Mathematics (STEM)

A2: Higher Institution Student

Ref. No.	Title	Institution	Award
167	A Comparative Evaluation of Wind Turbine Blades with Flow Control Methods	Universiti Sains Malaysia	**DIAMOND**
144	An Interactive Web-Based Application for Grid-Connected Photovoltaic System Sizing	Universiti Tun Hussein Onn Malaysia	**GOLD**
108	Estimating Bed Roughness in Smooth-Walled Open Channels Using Momentum Equation Terms	UCSI University	**GOLD**
166	FuturaGrow: An AI-Driven Urban Farming Platform Empowering Smarter Crop Care, Sustainability, and Productivity	Asia Pacific University of Technology and Innovation	**GOLD**
157	Onyx AI	Kolej Matrikulasi Perlis	**GOLD**
197	Hanyu Pinyin Learning Application	Kolej Vokasional Kuala Selangor	**GOLD**
191	e-Photography (AIS)	Kolej Vokasional Kuala Selangor	**GOLD**
195	The PiezoPatches	Kolej Matrikulasi Perlis	**GOLD**
156	Hydrahub: Community Rainwater Reservoir with Multiple Purpose Hall	UCSI University	**GOLD**
125	ThinkMeter for School	Politeknik Muadzam Shah	**GOLD**
199	741 Hz: Micro Speaker on Class Desk	Kolej Matrikulasi Perlis	**GOLD**
160	Life Insurance Ownership Factors Lapse Status and Insurance Literacy Consideration in Klang Valley	Universiti Kebangsaan Malaysia & Universiti Teknologi MARA Negeri Sembilan	**GOLD**
114	Pothole Detector Application (PDA)	Politeknik Sultan Salahuddin Abdul Aziz Shah	**GOLD**
126	MyAlumni SMALQ	Politeknik Muadzam Shah	**GOLD**
161	Aurelia Skin Scrub	Politeknik Tuanku Sultanah Bahiyah	**GOLD**
201	Sissagummy : Gummy from Watermelon Rind	Kolej Vokasional Kuala Selangor	**GOLD**
172	Integrated Record & Information Management System	Politeknik Mersing Johor	**GOLD**

Congratulations!

LIST OF WINNERS

CONTS..

Science, Technology, Engineering & Mathematics (STEM)

A2: Higher Institution Student

Ref. No.	Title	Institution	Award
187	ENGINUITY: Smart Solutions for Modern Engineering Consultancy	Politeknik Ungku Omar	GOLD
149	ALUMONGER	Kolej Matrikulasi Perlis	GOLD
150	Nova Nurse	Kolej Matrikulasi Perlis	SILVER
106	Multipurpose Smart Rinsing Machine	Kolej Vokasional Sungai Petani 1	SILVER
192	Solar Turbine Power Supply	Kolej Vokasional Batu Lanchang	SILVER
168	Re:FILE	Kolej Matrikulasi Perlis	SILVER
194	Portable Electrical Wiring Testing Kit	Kolej Vokasional Batu Lanchang	SILVER
211	Smart Reverse Vending Machine	Kolej Vokasional Batu Lanchang	SILVER
152	MEDIHOP	Kolej Matrikulasi Perlis	SILVER
202	NutriFit	Kolej Matrikulasi Perlis	SILVER
189	Splashsuit Swimwear	Asasi Sains Universiti Putra Malaysia	SILVER
193	WiFi Education Kit for SmartHome	Kolej Vokasional Batu Lanchang	BRONZE
213	Traffi-Logi: PLC Training Kit Using Traffic	Kolej Vokasional Batu Lanchang	BRONZE
200	Pensera	Institute of Teacher Education Rajang Campus	BRONZE
214	From Oil to Sun: Unlocking Indonesia’s Solar Energy Potential	Polytechnic Energy and Mineral Akamigas	BRONZE
154	CocoBriq-The Multifunctional Briquettes	Politeknik Tuanku Sultanah Bahiyah	BRONZE
123	Stay Safe Online	HEP College	BRONZE
124	Steps into The Future	HEP College	BRONZE

Congratulations!

LIST OF WINNERS

Science, Technology, Engineering & Mathematics (STEM)

A3: School Student

Ref. No.	Title	Institution	Award
186	2-in-1 Robotic System for Patient Screening and Treatment Monitoring in Healthcare Facilities	Triam Udom Suksa School of the Northeast	**DIAMOND**
116	Autonomous IoT Temperature and Humidity Detector System	SMK Perempuan Methodist Ipoh Perak, SJK(T) Chettiars Ipoh Perak & Smart Reader Silibin Ipoh Perak	**GOLD**
120	CHLOE - Smart Clothesline	SK Bandar Penawar	**GOLD**
117	Smart Drone for Monitoring and Mitigating River Pollution	SMK Perempuan Methodist Ipoh Perak, SJK(T) Chettiars Ipoh Perak & Smart Reader Silibin Ipoh Perak	**GOLD**
104	Pencuci Cengkerang Pintar (PCP): Optimum Cleanliness, Maximum Productivity	Kolej Vokasional Sungai Petani 1	**GOLD**
180	An AI-Powered Application for Diagnosing Heart Abnormalities	The Demonstration School of Nakhon Pathom Rajabhat University	**SILVER**
110	Guardian Time	Pakphanang school	**SILVER**
185	PillScan AI: Intelligent Pill Recognition and Elderly Medication Management	Sisaketwittayalai School	**SILVER**
171	Optimizing Horizontal Space Utilization and Expanding Green Areas through Urban Planning Based on Nested Regular Polygons Constructed by Connecting Midpoints of the Sides from the First to the n Layer	Rajsimawittayalai School	**SILVER**
131	Natural Mosquito Repellent Spray	SJKT Ladang Glenealy	**BRONZE**
153	Escape Math	Maktab Rendah Sains MARA Terendak	**BRONZE**
178	Solar Panel House	SJKT Ladang Emerald	**BRONZE**

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Congratulations! LIST OF WINNERS

Social Sciences & Humanities (SSH)

B1: Professional

Ref. No.	Title	Institution	Award
143	The Little Hydro Garden: Cultivating Environmental Awareness, Healthy Eating Habits and Moral Values among Preschool Children Through Hydroponics	SJK(C) Perak	**DIAMOND**
170	iZakat: Intergrated Zakat Computation and Payment	Kolej Yayasan Pelajaran Johor	**GOLD**
145	Digital GenWealth Robo-Adoption Model (DiGRAM)	Universiti Teknologi MARA	**GOLD**
164	Feeling Forest – AR Storytelling Card	Politeknik Tuanku Syed Sirajuddin	**GOLD**
140	Enhancing Student Well-being Before Counseling: Leveraging Mood Booster Apps for Optimal Outcomes (My Mood Booster Apps)	Kuching Vocational College	**GOLD**
210	Zigzag Shooting for Event, Exhibition & Gallery Preservation	Universiti Teknologi MARA Perak	**SILVER**
121	A Cry for Help: Understanding and Preventing Financial Abuse of Senior Citizens in Kedah and Perlis	Universiti Utara Malaysia	**SILVER**
212	Collaborative Digital Storytelling Platform for TESL Writing and Speaking	Universiti Poly-Tech Malaysia	**BRONZE**
148	Flipflap Clothes Folding Board Using 3-Dimensional Cartoon Characters as a Strategy for Exposing Children to the Crafts of Folding Their Clothes	Universiti Islam Antarabangsa Tuanku Syed Sirajuddin	**BRONZE**
190	HERITAGEBITE: An Interactive Approach to Creative Marketing of Kedah Malay Traditional Kuih	Universiti Utara Malaysia	**BRONZE**

Congratulations!

LIST OF WINNERS

Social Sciences & Humanities (SSH)

B2: Higher Institution Student

Ref. No.	Title	Institution	Award
119	Servify	Politeknik Tuanku Sultanah Bahiyah	**DIAMOND**
109	Uniting Five Forces: A Quintuple Helix Innovation for Inclusive Dyslexia Screening	The National University of Malaysia	**GOLD**
163	Dry Notes	Kolej Matrikulasi Perlis	**GOLD**
208	The Value-Centric Approach to Smart Farming in Malaysia's Paddy Sector: Uncovering Drivers and Barriers	Universiti Sains Malaysia	**GOLD**
113	FURRESH	Politeknik Tuanku Sultanah Bahiyah	**GOLD**
162	KIA G-NOSIS KIT	Universiti Sains Malaysia	**GOLD**
112	PAWPURIFY	Politeknik Tuanku Sultanah Bahiyah	**GOLD**
198	ACCURA- KVKS Pioneering Smart Accounting Tools	Kolej Vokasional Kuala Selangor	**GOLD**
118	BE-BOMB	Politeknik Tuanku Sultanah Bahiyah	**SILVER**
216	Unlock the Magic of Learning, Playing, and Reading: I SaBoBa Module	Universiti Pendidikan Sultan Idris	**SILVER**
103	SPARK Toolkit	Universiti Kebangsaan Malaysia	**SILVER**
101	Beyond the Textbook: How Artificial Intelligence is Sparking Student Engagement in English Language Learning	Universiti Kebangsaan Malaysia & Institut Pendidikan Guru Kampus Bahasa Antarabangsa	**SILVER**
107	Basil Bloom Hydrating Moisturizer	Bintulu Vocational College	**SILVER**
188	DellamarXpress: Better and Easier Ways to Enjoy Coffee Today	Politeknik Ungku Omar	**BRONZE**
203	A.K.I.R.A	Kolej Matrikulasi Perlis	**BRONZE**
207	MangoSwiss Cookies	Kolej Vokasional Kuala Selangor	**BRONZE**
159	Nourish to Flourish: Preventing Anemia Among Young Woman	Politeknik Tuanku Syed Sirajuddin	**BRONZE**

Congratulations!
LIST OF WINNERS

Social Sciences & Humanities (SSH)
B3: School Student

Ref. No.	Title	Institution	Award
196	HI-AID	SK Jeram Batu 20	**DIAMOND**
127	Sustainable Reformulation of Instant Waffle Mix	Kolej Vokasional Kuching	**GOLD**
115	Saffro Glow Cuddle Blusher	SJKT Simpang Lima	**SILVER**

LIST OF ABSTRACT

Beyond the Textbook: How Artificial Intelligence is Sparking Student Engagement in English Language Learning

Geoffrey Lim Fu Chien, Harwati Hashim & Nur Syafiqah Yaccob

Universiti Kebangsaan Malaysia & Institut Pendidikan Guru Kampus Bahasa Antarabangsa

Abstract - The evolving landscape of English Language Learning (ELL) instruction, both globally and in Malaysia, implies the necessity of transforming from traditional pedagogical approaches towards innovative, engagement-focused solutions. This is driven by the urgent need to move beyond traditional, textbook-centric pedagogical models that often result in a "one-size-fits-none" approach, a lack of authentic language practice, and the promotion of passive student roles, ultimately hindering genuine student engagement. A significant research gap exists in comprehensively conceptualizing how diverse AI affordances can systematically enhance student engagement in ELL. Hence, this conceptual paper aims to address this by providing a clearer understanding of AI's potential to spark student engagement in ELL. It explores how AI-driven personalization, adaptive learning platforms, real-time feedback mechanisms, and customized content generation can transform traditional ESL instruction by fostering greater student engagement. It also explores how AI-driven tools significantly enhance student engagement in ELL by providing personalized and interactive experiences. The insights gathered have profound implications for advancing SDG 4: Quality Education, informing Malaysian education policy, and realizing the human-centric vision of Education 5.0 through AI-enhanced ELL.

Innovative Mobility Solutions: Empowering Disabled Entrepreneurs with Smart 3-Wheel Bike

Nurnaddia Nordin, Nur Haiza Nordin & Nur Ilyana Amiiraa Nordin

Universiti Malaysia Kelantan

Abstract - Technology plays a vital role in business, especially for disabled entrepreneurs who face unique challenges. Many disabled individuals turn to entrepreneurship due to limited job opportunities and low labor market participation compared to non-disabled individuals. However, existing technology for disabled entrepreneurs is often inadequate, reducing their competitiveness. Operating a business is demanding, and for disabled people, additional barriers exist, such as the need for specialized technology or technical support. To address these challenges, the Smart 3-Wheel Bike was developed to provide better facilities for disabled entrepreneurs, enabling them to manage and operate their businesses more effectively and competitively. The product development followed three phases: analysis, design and development, implementation, and evaluation. During the analysis and evaluation stages, two case studies were conducted to assess the needs and acceptance of the prototype. Results showed that the Smart 3-Wheel Bike successfully met the specific requirements of disabled entrepreneurs. Moreover, it was well-received by people with disabilities, demonstrating its potential to enhance their business operations and competitiveness. This innovation highlights how targeted technological solutions can empower disabled entrepreneurs, improve accessibility, and foster greater participation in the entrepreneurial sector.

SPARK Toolkit

Asmahanim Haji Mohamad Yusuf, Assoc. Prof. Dr. Harwati Hashim, Dr. Nur Ainil Sulaiman & Mohd Nur Fitri Mohd Salim

Universiti Kebangsaan Malaysia

Abstract - Artificial Intelligence (AI) tools such as ChatGPT and Gemini are increasingly integrated into education, offering powerful opportunities for language learning, yet many ESL learners lack the skills to craft effective prompts, leading to shallow engagement and overreliance on AI for quick answers. This challenge undermines the development of autonomy, self-regulation, and critical thinking, which are essential for lifelong learning. The SPARK Toolkit (Smart Prompting for Autonomy, Reflection, and Knowledge) was developed as an innovative solution to this gap. Designed as a gamified box set with physical prompt cards and digital extensions, the toolkit equips ESL learners with structured approaches to AI interaction by categorizing prompts into four areas: Clarify, Practice, Reflect, and Create. Each card provides sample prompts with QR codes, allowing learners to engage instantly with AI platforms. The objectives of the toolkit are to cultivate prompt literacy among ESL learners, to empower learners to use AI as a partner rather than an answer machine, and to provide educators with a practical, scalable resource for classrooms or self-access learning centers. Its novelty lies in gamifying AI prompt literacy and directly linking it to learner autonomy through tangible and interactive resources. The SPARK Toolkit benefits learners by building confidence and independence, supports teachers with an adaptable classroom tool, and contributes to institutions by advancing IR4.0 and Education 5.0 agendas. Ultimately, it represents a creative and practical approach to harnessing AI for strengthening learner autonomy in ESL contexts.

BELA-WANG

Shellen Suri Anak Anthony

SK Abun Matu

Abstract - BELA-WANG is a game-based teaching and learning innovation developed to enhance Year 6 pupils' understanding of Topic 3: Money in the Mathematics curriculum, in alignment with the Dokumen Standard Kurikulum dan Pentaksiran (DSKP) Matematik Tahun 6. Inspired by the concept of the classic Monopoly board game, BELA-WANG incorporates not only the fundamental elements of money management but also integrates key concepts from Topic 2: Fractions, Percentages, and Decimals, providing pupils with a more comprehensive and engaging learning experience. This tool involves active participation from pupils, where one acts as a Bank Officer and others as Investors, solving mathematical problems involving basic operations—Addition, Subtraction, Multiplication, and Division—in real-life financial contexts. Through this interactive approach, students demonstrate increased interest and confidence in Mathematics, particularly in solving everyday problems involving money, profit, loss, dividends, assets, and liabilities. BELA-WANG also supports mental arithmetic skills and strengthens understanding of mathematical terminology in a practical setting.

Pencuci Cengkerang Pintar (PCP): Optimum Cleanliness, Maximum Productivity

Khairul Faizi Bin Othman Bakar, Aiman Luqmanul Hakim Bin Sahanas, Muhammad Adib Bin Mohd Adzhar, Muhammad Daeman Rifqi Bin Yusri & Muhammad Adam Bin Azhar

Kolej Vokasional Sungai Petani 1

Abstract - The Pencuci Cengkerang Pintar (PCP) project was developed as an eco-friendly innovation to address the challenges of shell cleaning with greater efficiency, cleanliness, and productivity. The core idea of this project is the utilization of recycled materials as the main components of the machine, emphasizing sustainability and cost-effectiveness. The structural framework of the machine is built using repurposed chair and table legs, providing stability and strength. The mechanical power is supplied by an exhaust fan motor, which generates rotational or vibrational movement to facilitate the cleaning process. In addition, a fan regulator is incorporated to allow users to adjust cleaning intensity according to the type and condition of the shells. The water tank functions as the main chamber to hold both the shells and water during operation. The uniqueness of this project lies not only in its functional efficiency but also in its innovative approach of transforming discarded items into practical technology. This makes the project aligned with national initiatives to promote green practices and sustainable innovation. With the Smart Shell Cleaning Machine, shell cleaning becomes faster, cleaner, and less labor-intensive, thereby increasing overall productivity. In essence, this project does more than solve the issue of shell cleaning; it has the potential to serve as a sustainable innovation model at the national level. It is envisioned to inspire communities to be more creative in repurposing used materials for the development of innovative products that generate positive impacts on the economy, the environment, and social well-being.

Basil Bloom Hydrating Moisturizer

Wannie Stewart, Gwence Defany Anak Boniface, Nurfarhanie Natasha Binti Nafrizal, Jessica Jabah Anak Linggang, Ezziatul Zaharah Binti Abdul Razak & Putri Nur Syahannaz Evanatiqa Binti Zorime

Bintulu Vocational College

Abstract - Dry and dull skin is a common dermatological concern experienced by individuals irrespective of age or gender. This condition results from insufficient natural moisture within the epidermal layer, often influenced by environmental factors such as extreme weather conditions, inappropriate use of skincare products, unhealthy lifestyle practices, and inadequate water intake. Insufficient skin hydration not only causes a rough and lackluster appearance but may also contribute to irritation, erythema, and premature aging. This study aims to examine the primary factors associated with dry and dull skin, as well as potential treatment approaches, with particular emphasis on the use of moisturizers. While numerous moisturizers are available commercially, most are predominantly formulated with aloe vera as the key ingredient. In this study, basil (Ocimum basilicum) is explored as an alternative natural ingredient for the development of a specialized moisturizer. Basil has demonstrated significant potential in cosmetic applications due to its hygroscopic properties, which enable water absorption and natural gel formation that help maintain skin hydration. Furthermore, basil is rich in bioactive compounds with antioxidant, antibacterial, and anti-inflammatory properties, including eugenol, which may contribute to improved skin health. The incorporation of basil as the primary active ingredient in a moisturizer formulation presents a promising natural alternative for the management of dry and dull skin.

Multipurpose Smart Rinsing Machine

Khairul Faizi Bin Othman Bakar, Abdullah Fahim Bin Abd Aziz, Muhammad Adam Mukhriz Bin Mohd Faizal & Ahmad Hariz Najmi Bin Mohd Zul

Kolej Vokasional Sungai Petani 1

Abstract - This project aims to introduce an innovative technology design for a multipurpose smart rinsing machine, which is designed to assist in the efficient washing of food ingredients. The main purpose of this machine is to clean dirt, dust, and foreign objects present on food ingredients before they are cooked. The primary advantage of this developed project is to increase the efficiency of time and energy in the washing process of food ingredients, as well as to enhance the cleanliness of the food items. This project includes several features that aim to help users clean food ingredients in large quantities without needing to go through the washing process repeatedly. Some of the features included in this project are a washing container, a water flow system, a system for outputting cleaned items, and a mixing system for even washing. The aspect of originality also involves a continuous approach toward the improvement and optimization of the rice washing machine design based on feedback from actual users. The originality of this project can also be evaluated based on its impact on catering entrepreneurs and the food production industry, with the potential to set new standards or inspire innovations in this field. This project is constantly updated with new innovations based on user feedback and advancements in technology, ensuring it remains relevant and meets current needs. By emphasizing these aspects, the "Multipurpose Smart Rinsing Machine" project demonstrates originality in its design approach, technology application, versatility, and its impact on the relevant industry. The uniqueness of this project lies not only in the design and technology used but also in its holistic approach to comfort, usability, and sustainability. This makes the project an innovative and effective choice in the context of usage in the food production industry.

Estimating Bed Roughness in Smooth-Walled Open Channels Using Momentum Equation Terms

Melvin Kho Ying Fan, Tom Baldock & Moon Wei Chek

UCSI University

Abstract - Accurate estimation of the equivalent sand grain roughness, ks, is critical for precise hydraulic modeling in open channel flow, yet it remains a parameter that cannot be directly measured. This study proposes a practical, replicable methodology to objectively derive ks values under controlled laboratory conditions by decomposing the momentum equation to distinguish shear stress contributions from channel walls and bed. Experiments were conducted using three bed types: smooth glass, rubber mat, and artificial grass across varying flow rates in laboratory flumes. Friction factors were determined using a “goal seek to zero” method in Microsoft Excel, and ks values were subsequently derived using four established equations: Colebrook-White, Haaland, Swamee-Jain, and Moody Chart estimation. Results showed that the Excel-based and Colebrook-White methods provided the most reliable ks values, with the Haaland and Swamee-Jain equations consistently under- and over-estimating respectively. The average ks values obtained were 0.0599 mm for the smooth bed, 18.8 mm for the rubber mat, and 9.23 mm for the grass bed. The proposed method enhances objectivity in determining ks, especially for composite channel surfaces, offering improved accuracy for hydraulic engineers and researchers in flow resistance modeling.

Uniting Five Forces: A Quintuple Helix Innovation for Inclusive Dyslexia Screening

Nik Zatul-iffah Bt N Mohd Nabil, Assoc. Prof. Dr. Mohd Effendi Ewan Mohd Matore & Dr. Mohd Syazwan Zainal

The National University of Malaysia

Abstract - Dyslexia is a neurodevelopmental disorder marked by persistent difficulties in reading and spelling, which may lead to long-term academic underachievement and socio-emotional challenges. Early screening is critical, but implementation remains inconsistent, particularly in resource-limited settings with inequitable access to diagnostic tools. To address this gap, this study introduces an innovative framework for early dyslexia screening grounded in the Quintuple Helix model, which cater five dimensions such as mobilizes academia, industry, government, community and the environmental dimension into a collaborative ecosystem. This study employed a narrative literature review (NLR) method to synthesize evidence on systemic barriers, effective screening practices and the potential of multi-stakeholder innovation in educational contexts. Findings from the review highlight that the academia sector contributes empirical research and validated screening instruments, while industry drives technological innovations through digital platforms and artificial intelligence. The government dimension plays a vital role in shaping equitable policies and resource allocation, whereas the community dimension fosters awareness, parental engagement, and stigma reduction. Importantly, the environment dimension adds novelty by embedding sustainability, ensuring that solutions are not only adaptable across diverse educational systems but eco-friendly and cost-effective. The primary objective is to close the screening gap by aligning these five dimensions into a unified framework that fosters inclusive, evidence-based and culturally responsive practices. This integrative approach is novel in embedding sustainability into educational innovation while strengthening early identification efforts. Beyond improving accessibility and reliability, the framework has the potential to transform current practices by supporting timely interventions that reduce educational inequities. This Quintuple Helix approach advances both educational equity and SDG 4, ensuring that no learner is left behind. Future research should focus on piloting this framework in real educational settings, testing the effectiveness of digital tools, policy integration and community-based interventions, while also evaluating long-term sustainability across diverse cultural and environmental contexts.

Stay Safe Online

Young Wei Cheng, Chin Hao Ken, Tan Chun Khai, Ng Xuan Kai & Abdul Rahim Bin Zulkifli

HEP College

Abstract - This poster highlights the rapid evolution of Information Technology and its role in transforming modern life. It focuses on key areas such as Artificial Intelligence, Cybersecurity, Cloud Computing, and Networking. The design represents the digital flow of information, symbolizing how technology connects people, businesses, and innovations globally. The poster aims to inspire viewers to embrace IT as a tool for progress and creativity. Color Scheme: Dark gradient background (navy to black) with neon blue and electric green highlights, white/silver text for readability. Design Elements: Abstract digital waves, binary code streams, and glowing network nodes to emphasize the futuristic theme.

Guardian Time

Loedsak Ramsri, Harit Nuanpan, Kanapot Kaewead, Thammarat Sutthichat & Konkanok Kaeomueang

Pakphanang school

Abstract - Ischemic stroke is a major global health problem and one of the leading causes of death and disability. It occurs when blood flow to the brain is blocked by arterial narrowing or obstruction, leading to oxygen deprivation. Patients often suffer from paralysis, slurred speech, or vision loss. According to the World Health Organization (WHO), stroke is the second leading cause of death worldwide, and more than 70 percent of cases are ischemic. Key risk factors include hypertension, diabetes, hyperlipidemia, smoking, stress, and lack of exercise. To address this challenge, our team developed "Guardian Time", a smart wrist-worn device designed to detect and assess stroke risks. The device continuously monitors blood pressure and heart rate while employing AI-powered facial recognition to identify abnormal asymmetry and acoustic analysis to detect irregular speech. It also integrates Near-Infrared (NIR) laser technology for non-invasive blood lipid detection. Data collected by the wristband are transmitted to a mobile application that analyzes results and provides real-time alerts to caregivers or medical staff. This rapid response reduces the chance of severe complications through early detection and timely treatment. Beyond stroke prevention, Guardian Time helps assess other health conditions such as hypertension, hypotension, kidney failure, hyperlipidemia, and heart failure. By combining advanced technology with accessible care, Guardian Time empowers individuals to recognize health risks earlier and supports better medical outcomes. Ultimately, it aims not only to save lives but also to improve quality of life for millions worldwide.

PAWPURIFY

Muhamad Shiraj Bin Abuthalha, Nurafrina Syamimi Binti Rosman, Darshana A/P Magendran, Nursyazanani Binti Anzanee & Faizan Maisarah Binti Abu Bakar

Politeknik Tuanku Sultanah Bahiyah

Abstract - Pet ownership has been steadily increasing in Malaysia, resulting in greater demand for pet care products that are safe, effective, and environmentally responsible. However, conventional products often expose both pets and humans to harmful chemicals, parasites, and zoonotic diseases. At the same time, organic waste such as tea waste is frequently discarded, contributing to soil and water pollution. Addressing these issues, this project, PAWPURIFY focuses on the development of an innovative and sustainable pet care solution. The main objective of this project is to formulate, produce, and promote a natural clay detox powder for pets using eco-friendly and biodegradable ingredients, including tea waste, turmeric, neem leaves, activated charcoal, and chamomile. This product is designed to improve pet and human health by preventing skin irritation, parasites, and zoonotic infections, while remaining safe, non-toxic, and affordable for all groups of pet owners. The detox clay works as a natural protective powder with strong absorbent and detoxifying properties. It helps to maintain pet hygiene by reducing odours, minimizing irritation, and preventing disease transmission. In addition, the product contributes to sustainability by upcycling tea waste and other natural resources into value-added products, supporting responsible consumption and production practices. The novelty of this innovation lies in its unique combination of natural ingredients, dual function as both detox and preventive care, and eco-friendly approach compared to chemical-based alternatives. With its affordability, safety, and sustainability, the project not only enhances pet well-being but also supports the global effort towards zero-waste and green innovation.

FURRESH

Muhammad Akmal Daniel Bin Rafidi, Nurainatul Ismah Binti Ahmad Sobri, Aina Umairah Binti Ahmad Shukri, Siti Hajar Binti Norasmadi & Faizan Maisarah Binti Abu Bakar

Politeknik Tuanku Sultanah Bahiyah

Abstract - Pet ownership in Malaysia has been rising steadily, creating an increasing demand for safe, effective, and environmentally friendly pet care products. Conventional cat litter, especially clay or silica-based, poses significant problems as it is non-biodegradable, requires destructive mining, consumes high energy during production, and may release harmful dust that can cause respiratory issues in both pets and humans. This project was initiated to address these concerns by introducing an innovative eco-friendly cat litter named Furresh, developed from cassava pulp and recycled coffee grounds. The main objectives are to reduce dependency on non-biodegradable materials, promote sustainability through agricultural waste upcycling, and provide pet owners with a healthier, chemical-free alternative. Cassava pulp functions as the primary absorbent due to its natural fibrous texture that enhances clumping ability, while coffee grounds act as a natural deodorizer with strong odour-masking properties. Small amounts of corn flour and baking soda are also incorporated to improve texture and odour control. The novelty of Furresh lies in its unique combination of agricultural by-products rarely applied in cat litter formulation, producing a product that is not only biodegradable and compostable but also supports zero-waste initiatives. By utilizing locally available resources, Furresh promotes a circular economy, reduces environmental pollution, and raises awareness of sustainable pet care practices. With its affordability, effectiveness, and eco-friendly attributes, this project has strong potential for commercialization in the growing pet care industry while contributing to the achievement of multiple Sustainable Development Goals (SDGs).

BE-BOMB

Siti Alyaa Mesarah Binti Budi, Muhammad Ameer Isyraff Bin Hasrul, Nur Liana Binti Mohd Noor, Leoh Jin Fu & Sharipah Khadijah Binti S.Hashim

Politeknik Tuanku Sultanah Bahiyah

Abstract - The growing demand for natural, chemical-free personal care products has created opportunities for innovation in the health and beauty industry. Many people are now turning to herbal products for their health, but one very powerful local ingredient is still receiving little attention: betel leaves. Betel leaves are well-known in traditional medicine for their natural antibacterial and antiseptic properties, but their use in bath products is still limited. This innovative project introduces BE-BOMB, a natural bath bomb product made entirely from dried betel leaves, offering a safe, skin-friendly, and eco-friendly alternative for personal well-being. The process of making BE-BOMB is simple: select ripe betel leaves, wash, dry naturally, and produce a bath bomb without added chemicals. The study used a basic questionnaire to obtain consumer feedback and a SWOT analysis to assess the strengths and opportunities of the product in the market. The results show high interest from consumers in bath products based on natural, local ingredients that provide health benefits. The project supports Sustainable Development Goals (SDG) 3 (Good Health and Well-being), SDG 8 (Decent Work and Economic Growth), and SDG 12 (Responsible Consumption and Production). In conclusion, local herbs such as betel leaves can be processed into innovative products that are simple, sustainable, and support a healthy lifestyle and green entrepreneurship.

Pothole Detector Application (PDA)

Hasya Farhanah Binti Salrizal, Khalish Nur Ellysha Binti Rosmadi, Zarifah Farisha Binti Zaini, Bong Siek Wie & Ts. Dr. Ainul Haezah Binti Noruzman

Politeknik Sultan Salahuddin Abdul Aziz Shah

Abstract - Roadways are the primary sources of fatalities, often resulting from accidents. The increasing incidence of road accidents underscores the urgent need for the adoption of innovative strategies aimed at enhancing driver safety and optimizing traffic management. A significant challenge is the limited availability of real-time traffic and road conditions data to drivers, which impedes effective route planning and contributes to congestion. Simultaneously, existing road hazards reporting systems are inefficient, resulting in delayed repairs and prolonged risk, while local authorities grapple with outdated and incomplete information, hindering proactive infrastructure maintenance. This research proposes an integrated framework that utilizes smartphone-based sensors (such as accelerometers, GPS, and gyroscopes) and external IoT devices to collect real-time road condition data, including information on potholes, bumps, and surface roughness. Through the analysis of aggregated sensor data, the system identifies persistent problem areas to inform long-term infrastructure planning, maintenance and budget allocation. Furthermore, it provides drivers with dynamically updated alternative routes to avoid hazards and congestion, thereby enhancing traffic flow and reducing accident risks. The scope includes comprehensive safety for road users, emphasizing the integration of real-time analytics with route optimization algorithms. This approach not only equips drivers with actionable insights but also supplies authorities with accurate, timely data to prioritize maintenance efforts. The proposed system has the potential to reduce accident rates, improve urban mobility, and promote data-driven decision-making for sustainable transportation infrastructure.

Servify

Mohamad Darwisy Hafiy Bin Shamsul Fazli, Puteri Batrish Batrishsya Binti Jafri, Nur Aufa Nisa Binti Mohd Anuar Affendi, Suhas Varma A/L Daiva Selha Mani & Farizoh Binti Hamid

Politeknik Tuanku Sultanah Bahiyah

Abstract - Servify is a digital innovation developed to address the challenges faced by communities in accessing reliable home service providers such as plumbers, electricians, and air-conditioning technicians. Many individuals struggle to find trustworthy service options, mainly due to the absence of a centralized platform and the risk of scams through fake advertisements. To overcome this issue, Servify was designed as a Telegram-based application that collects and organizes verified service provider information. The platform covers a wide range of essential services, including cleaning, pest control, electrical wiring, air-conditioning maintenance, locksmith services, and landscape care. Through these features, users can quickly and securely access various reliable services at their fingertips. The development process involved data collection, systematic data organization, and the creation of a user-friendly platform integrated with AI-powered matching and verification. By simplifying access and enhancing service reliability, Servify provides significant benefits such as time savings, increased safety, and improved user trust. This project demonstrates Servify's potential to serve as a centralized platform for essential services in Malaysia, contributing to community well-being and promoting a safer digital ecosystem.

Saffro Glow Cuddle Blusher

Shehsan Sheerthikgan Nathan, Thanushree A/P Indran, Ruksita A/P Kumaran & Logeetha Ramu

SJKT Simpang Lima

Abstract - The Saffro Glow Cuddle Blusher is a natural, dual-purpose cosmetic designed to meet the growing demand for safe, skin-friendly, and eco-conscious beauty solutions. Many commercial blushers contain synthetic chemicals that irritate sensitive skin, especially in hot and humid climates. Additionally, most are packaged in non-recyclable plastic, contributing to environmental waste. This innovation offers a safer, more sustainable alternative by combining the functions of a blusher and eyeshadow into one product. Made with plant-based ingredients such as shea butter, argan oil, jojoba oil, and beeswax, it provides a smooth and nourishing base. Beetroot powder gives a natural rosy color, while pearl powder adds a soft glow. Saffron strands enhance the formulation with brightening, anti-inflammatory, and antioxidant properties. The blusher is prepared using a simple DIY method, where ingredients are melted and blended before being poured into cleaned, recycled containers. It is free from harmful chemicals, gently scented, and safe for everyday use, with a shelf life of 6 to 12 months. Affordable and eco-friendly, this product encourages waste reduction, ethical beauty habits, and creative reuse. The Saffro Glow Cuddle Blusher promotes healthy skin and environmental care, making it ideal for students and anyone seeking clean, practical, and natural cosmetic options. The Saffro Glow Cuddle Blusher is a natural, dual-function cosmetic that works as both a blusher and eyeshadow. It is designed for those who want safe, skin-friendly, and eco-conscious beauty options. Many commercial products contain harsh chemicals and come in plastic packaging that harms the environment. This innovation uses plant-based ingredients like shea butter, argan oil, jojoba oil, and beeswax to create a smooth, nourishing base. Beetroot powder gives a rosy tint, pearl powder adds a natural glow, and saffron strands provide brightening and antioxidant benefits. The product is made using a simple DIY process, poured into recycled containers to reduce waste. It is free from harmful chemicals, lightly scented, and suitable for daily use with a shelf life of 6–12 months. Affordable and easy to make, this cosmetic encourages clean beauty habits and care for the environment. It’s perfect for students and beginners who want a safe, creative, and natural makeup alternative.

AquaLove: Seawater-Activated Thermal Rescue Blanket for Marine Hypothermia Prevention

Sharir Aizat Kamaruddin, Ahmad Luqman Hakim Abd Rahim, Muhammad Iqbal Omar, Muhammad Qayyum Hafiq Sulaiman, Khairul Naim Abd Aziz & Jamil Tajam

Universiti Teknologi MARA, Perlis Branch, Arau Campus

Abstract - The AquaLove Thermal Rescue Blanket is an innovative rescue solution against hypothermia on the ocean, and it employs a nontoxic reaction of magnesium-iron saline that produces instant heat upon contact with seawater, along with a reflective Mylar coating to retain heat. It's compact, lightweight, battery-free, and can be stowed away in lifejackets, lifeboats, or rescue packs. All of 30 interviewees assigned high importance to portability, followed by rapid heating and no batteries required as its most important features, with offshore workers, divers, water sports participants, and rescue team members being the most important users. High usage potential (93.3%) was reported by most of the interviewers, with a desired price range of RM50–RM200. Overall, the blanket has high market potential as a cheap, practical, and innovative marine safety emergency tool.

Autonomous IoT Temperature and Humidity Detector System

Sharvika Vijaya Raman, Thipikaa Vijaya Raman, Mirtika Vijaya Raman & Suria Prakkash A/L Vijayasuria

SMK Perempuan Methodist Ipoh Perak, SJK(T) Chettiars Ipoh Perak & Smart Reader Silibin Ipoh Perak

Abstract - As climate change intensifies in 2025, ensuring optimal indoor classroom environments in Malaysia has become essential for protecting student health, comfort, and academic performance. To address this, we have developed an innovative Autonomous IoT Temperature and Humidity Detector System, powered by Arduino IoT technology, which operates with minimal human intervention and collects real-time environmental data. This system, which has officially received copyright protection for innovation, identifies critical fluctuations in temperature and humidity across different school settings, enabling prompt actions to maintain conducive learning environments. The implementation of this smart monitoring system not only contributes to healthier schools but also aligns with Malaysia's Smart City Blueprint 2025 by promoting intelligent and sustainable solutions for public infrastructure. Furthermore, the project supports the United Nations Sustainable Development Goals, specifically SDG 3 (Good Health and Well-being), Target 3.9, by addressing indoor environmental quality, and SDG 9 (Industry, Innovation, and Infrastructure), Target 9.5, by fostering scientific innovation and the integration of advanced technologies in educational facilities. Through this initiative, we aim to enhance learning environments and contribute meaningfully to the creation of smarter, healthier, and more resilient communities. Beyond classrooms, the system can be adapted for offices, healthcare centers, and public facilities, making it a versatile solution for diverse environments. Its modular design ensures scalability, allowing integration with renewable energy systems and cloud-based analytics platforms for predictive insights. By combining affordability with advanced IoT capabilities, the project demonstrates how innovation can bridge gaps between technology and sustainability, while empowering institutions to adopt greener practices and prepare the next generation for a digitally connected, climate-resilient future.

A Cry for Help: Understanding and Preventing Financial Abuse of Senior Citizens in Kedah and Perlis

Norhafiza Nordin, Rabihah Md. Sum & Nazliatul Aniza Abdul Aziz

Universiti Utara Malaysia

Abstract - Elder financial abuse is the exploitation or inappropriate use of the financial resources belonging to older adults. This form of abuse often involves manipulating or taking control of an older person's assets or money without their consent. The effect of financial abuse is typically more challenging to observe compared to physical abuse. Unlike physical abuse, which usually has a visible effect, the impact of this abuse is more subtle, as it usually involves one's emotional and mental well-being. Nevertheless, the effects can potentially harm the victim's physical and psychological health. This study investigates the knowledge and awareness of financial abuse among senior citizens in Kedah and Perlis. The data were collected using a survey, from which 122 responses were obtained. The surveys were conducted using two methods: online and offline. An online Google Form was shared via email or WhatsApp, while physical questionnaires were distributed and administered by enumerators. The findings show that senior citizens in these two states have a moderate level of knowledge and awareness about financial abuse. These findings may assist relevant stakeholders in taking proactive measures to enhance both the knowledge and awareness of senior citizens as well as that of the general public.

Smart Drone for Monitoring and Mitigating River Pollution

Sharvika Vijaya Raman, Thipikaa Vijaya Raman, Mirtika Vijaya Raman & Suria Prakkash A/L Vijayasuria

SMK Perempuan Methodist Ipoh Perak, SJK(T) Chettiars Ipoh Perak & Smart Reader Silibin Ipoh Perak

Abstract - In support of the Malaysia Smart City Framework (MSCF) under the Smart Environment and Smart Infrastructure pillars, this project introduces a Smart Drone System designed to monitor and mitigate river pollution using advanced technologies. Malaysia faces increasing river pollution challenges caused by urbanization, industrial waste, and improper solid waste disposal, leading to deteriorated water quality and negative impacts on public health and biodiversity. This system, which has officially received copyright protection for innovation. The system features a custom-designed, lightweight 3D-printed cage installed beneath the drone, enabling it to physically capture floating debris such as plastic waste in rivers. Through real-time aerial surveillance, the drone helps identify pollution hotspots, allowing for efficient and targeted clean-up efforts. This approach provides an automated, cost-effective, and adaptable solution for managing urban waterways. The project aligns with the Malaysia 2030 Plan, which prioritizes sustainable urban development, environmental protection, and the integration of smart technologies to improve quality of life. It supports SDG 6: Clean Water and Sanitation and SDG 11: Sustainable Cities and Communities, contributing to Malaysia's vision of resilient and environmentally sustainable smart cities through practical, scalable innovation. Additionally, this system highlights the potential of combining drone technology with additive manufacturing to create versatile and sustainable solutions for pressing environmental challenges. Beyond river clean-up, the design can be adapted for flood monitoring, waste segregation, and ecological studies, offering wider applications in urban management. This innovation strengthens Malaysia's capacity to implement smart, green, and resilient technologies that safeguard natural ecosystems for future generations and supports the growth of Smart Cities in Malaysia.

Steps into The Future

Wong Chia Fung, Purani A/P Sunder, Tan Esean, Lee Qian Xin & Abdul Rahim Bin Zulkifli

HEP College

Abstract - This poster, "Step Into the Future," introduces Virtual Reality (VR) and Augmented Reality (AR) in a simple and clear way. It highlights the main differences between VR and AR, using bold titles, short points, and the slogan "Experience Beyond Reality" to make the design eye-catching and futuristic. The aim is to help viewers quickly understand these technologies and their role in shaping the future. This poster Introduces Virtual Reality (VR) and Augmented Reality (AR) in a simple, clear way. Highlights the main differences: VR is 75% virtual, requires headsets, while AR is 75% real and does not always need extra devices. Inspires people with the slogan "Experience Beyond Reality!". By using short, easy-to-read points, the poster helps viewers quickly understand what VR and AR are, and why they are important technologies for the future. The design features a clean, simple background to keep the focus on the content, with a bold, repeated "Step Into the Future" as the title to create a striking, futuristic effect. The main text is in dark, easily readable tones, while "VR" and "AR" are emphasized in big, bold type to immediately highlight the topic. A motivating slogan is strategically placed to add an extra layer of inspiration and futuristic excitement.

CHLOE - Smart Clothesline

Muhammad Isyraf Daniel Bin Mohd Hafiz, Ahmad Qaizer Bin Ahmad Firdauz, Ahmad Ibrahim Bin Amir Hamzah, Mohamad Qalif Aimy Bin Mohammad Syahrin & Normalina Binti Abdul Rahman

SK Bandar Penawar

Abstract - CHLOE – Smart Clothesline is a sustainable solution that integrates Internet of Things (IoT) technology and solar energy to address challenges in manual clothes drying, particularly due to unpredictable weather. A user needs survey revealed that 90% of users experience difficulties in drying clothes because of rain concerns, while 85% require a clothesline suited to their busy lifestyles. To meet these needs, CHLOE is designed as a lightweight, portable smart clothesline equipped with rain detection sensors and automatic user notifications. It combines Micro:bit sensors with an IoT system to monitor weather changes and activate an automatic canopy that shields clothes from getting wet. Users are also alerted through a mobile application, ensuring convenience and peace of mind. Beyond functionality, CHLOE reduces reliance on electric dryers, saves energy, and supports carbon emission reduction. This aligns with global efforts toward sustainability and encourages eco-friendly living practices. Findings from this study highlight that CHLOE is not only user-friendly with minimal maintenance requirements, but also demonstrates strong potential for replication and commercialization in the industry. Furthermore, it offers significant opportunities for future research and innovation in smart technology, making it a practical and impactful solution for modern households.

Keywords: Smart Clothesline, IoT, Micro:bit, Solar Energy, Rain Sensor

ThinkMeter for School

Erfan Nufael Saufee, Fikri Naim bin Faudzinaim, Mohamad Danial Hafizuddin bin Mohammad Hisham & Tengku Diyana Binti Tengku Ibrahim

Politeknik Muadzam Shah

Abstract - ThinkMeter for School is a smart web-based quiz system that aims to bring about a revival of assessment in Technical and Vocational Education and Training (TVET). It was created to fix the weaknesses of the traditional assessment tools such as Google Forms and uses Artificial Intelligence (AI) to redefine skills assessment based on Bloom's Taxonomy. In the case of our client, the Chemistry Department of SMT Kuantan, ThinkMeter allows the automatic creation of questions based on the cognitive level: knowledge of complex theories to practical application of laboratory processes and the use of multimedia features, such as the possibility to view a molecular structure in order to test it in a realistic situation.Teachers have an effective tool to author and mark assessments and the administrative workload is now cut drastically. According to students, it provides real-time and detailed analytics and PDF-based reports that go beyond a basic pass/fail report to identify their individual strengths and weaknesses in their understanding of chemistry. ThinkMeter will improve educational results, equip a stronger workforce in the chemical industry, and provide a scalable framework to support the modernization of TVET assessment in Malaysia.

MyAlumni SMALQ

Amani An Nur Binti Ridzuan, Nur Nabillah Binti Mohd Nor, Mirza Nur Balqis Binti Mohd Fauzi & Tengku Diyana Binti Tengku Ibrahim

Politeknik Muadzam Shah

Abstract - MyAlumni SMALQ is an innovative digital platform developed to assist schools in efficiently managing and tracking alumni information after graduation. Many institutions still rely on manual calls or social media to monitor alumni, which often leads to inaccurate, incomplete, and outdated records. This challenge results in missed opportunities for mentoring, networking, and knowledge sharing. To address this gap, MyAlumni SMALQ integrates web and mobile applications with Artificial Intelligence (AI), providing a centralized and sustainable solution for alumni engagement. The system enables administrators to manage alumni data, monitor career progress, and evaluate program effectiveness, while alumni can update profiles, share experiences, success stories, and opportunities. AI-powered instant Q&A allows students to interact directly with alumni, gaining valuable guidance and real-time insights. Unlike conventional alumni systems, this approach ensures continuous collaboration, long-term engagement, and institutional growth. Beyond functioning as an alumni database, MyAlumni SMALQ acts as a collaborative ecosystem that strengthens alumni–student bonds, supports career readiness, and contributes to community development. By fostering sustainable connections and promoting lifelong learning, the system plays a vital role in advancing education while inspiring future generations through alumni experiences.

Sustainable Reformulation of Instant Waffle Mix

Edwin Miguel Anak Roger Moore, Muhammad Darwish Haiqal Bin Yusu, Nur Farisya Binti Muhaimin Nazmi & Tang Tien Mee

Kolej Vokasional Kuching

Abstract - Experts increasingly recognise food processing and reformulation as essential for developing food products that align with nutritional and sustainable goals. This study focuses on innovative formulation and processing methods to create an instant waffle mix that aligns with consumer health needs while reducing environmental impact. The new formulation of Borneo's Grains Waffle Mix addresses the limitation of the original prototype by embedding sustainability principles throughout the production chain. The key ingredients are locally sourced from Sarawak, including purple rice, purple sweet potatoes, trumpet mushrooms, and jackfruit seeds. Jackfruit seeds are repurposed to reduce food waste and serve as a source of plant-based protein. The selected ingredients are rich in dietary fibre, antioxidants, and other nutrients, supporting both health and sustainability. The formulation is entirely plant-based, using gluten-free ingredients to eliminate the need for refined flour. Overall, this reformulation supports multiple SDGs such as SDG 2 (zero hunger); SDG 3 (good health & well-being); SDG 12 (responsible consumption) & SDG 13 (climate action). Findings from the consumer sensory evaluation and product perception assessment indicate a positive acceptance, with over 80% of respondents indicating that they would consider buying this product in the future. In conclusion, the reformulated waffle mix demonstrates promising potential as a sustainable food innovation that aligns with consumer preferences while supporting global sustainability goals.

AquaNexus: Advanced Dive Mask with Hazard Detection and Fish ID

Sharir Aizat Kamaruddin, Nur Resya Badruldin, Nur Athirah Filzah Atan, Nor Arifah E'Liyana Azlan, Khairul Naim Abd Aziz & Nor Shafikah Idris

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Abstract - Scuba diving offers unique opportunities for exploration, research, and recreation, yet divers continue to face challenges related to navigation, hazard awareness, and situational monitoring. Traditional dive masks provide only basic protection and visibility, without integrated support for advanced underwater data. This research paper introduces Aqua Nexus, an advanced smart dive mask designed to enhance diver safety, awareness, and overall experience through real-time monitoring and augmented information display. The system integrates key features such as depth measurement, oxygen level monitoring, pressure and temperature sensors, and Light-emitting diode, LED lighting, while incorporating upgraded functions including fish identification, hazard detection and Global Positioning System, GPS navigation. These innovations provide divers with critical data directly within their field of vision, enabling better decision-making and reducing risks during dives. Key metrics include accuracy of detection, usability, and its impact on diver confidence and safety. In addition, AquaNexus is designed with a user-centered approach, ensuring comfort, durability, and ease of use during extended underwater activities. The mask's ergonomic structure reduces strain while its waterproof build ensures reliable performance even in challenging marine environments. The fish identification system not only aids divers in recognizing marine life but also supports educational and research purposes, providing valuable insight for marine conservation. Hazard detection improves situational awareness, alerting divers to potential risks such as underwater dangerous marine species. The GPS navigation further enhances safety by allowing divers to track their location and avoid disorientation. AquaNexus represents a significant advancement in smart diving technology, combining innovation with practicality. It aims to make diving safer, smarter, and more inclusive, encouraging both recreational divers and professionals to explore the underwater world with greater confidence.

MarGuard: Submersible Smart Gauntlet Distress Beacon and Personal Flotation Device

Sharir Aizat Kamaruddin, Muhammad Amin M.H.D Zhaine, Muhammad Afiq Izzuddin Rusli, Muhammad Fakhrusy Syakirin Mohd Lehat, Muhammad Syamil Aizad Jumat, Khairul Naim Abd Aziz & Rohayu Ramli

Universiti Teknologi MARA, Perlis Branch, Arau Campus

Abstract - Ocean accidents like, man overboard or ship being blown off course can become life-threatening quickly if response times are delayed. Safety equipment available now like life jackets will keep a person above the water, and but they do not have any notification providing a way for rescuers to find the person in the water. Our project is to address these issues with our proposed smart wearable safety device, MarGuard, for people that work and travel on the ocean. MarGuard can sense if a person has fallen overboard, transmit his or her Global Positioning System (GPS) coordinates to all nearby vessels and available rescue crews, deploy an orientation buoy to prevent the person from sinking, and transmit a flashing light signal for night-time rescues. Just to note, MarGuard includes short emergency messages, group tracking for teams, and emergency features. These safety device features were utilized to minimize potential rescue time and maximize their potential survivability.

BeaconTech: Wearable Mini-EPIRB Wrist Unit

Sharir Aizat Kamaruddin, Muhammad Ikhwan Syafiq Shuhainizam, Muhammad Afiq Hifzhan Hamdan, Akmal Hafiz Johari, Khairul Naim Abd Aziz & Rosnani Nazri

Universiti Teknologi MARA, Perlis Branch, Arau Campus

Abstract - In maritime operations, individuals are highly prone to risky situations such as harsh weather conditions, overboard incidents, vessel accidents and so on, which later leads to a necessity of having a reliable and trustworthy personal safety device. This chapter highlights BeaconTech, an innovation that emphasizes the use of a mini-EPIRB wrist unit designed specifically for people that are related to maritime operations or their environments. Unlike common EPIRBs that are usually bulky in size and placed on a vessel, this innovation offers a more convenient, smaller, lightweight, and user-friendly option while at the same time enabling immediate access in times of emergency. The mini-EPIRB wrist unit incorporates the integration of various features such as GPS, automatic water activation, and a long-lasting battery, which are crucial for rapid distress signaling as well as precise location tracking. This device regulates by transmitting emergency alerts to satellite networks, allowing response time to be reduced significantly, thus increasing the chances of safe and rescue operations being carried out more efficiently. To add, the design itself is ergonomic and accustomed to people who are exposed to tough marine environments, such as offshore workers, recreational sailors, fishermen, and rescue personnel. Moreover, continuous field trials have proved their usefulness in improving the chances of survival outcomes by interconnecting the gap between conventional vessel-based beacons and personal safety needs.

BioShield Paint: Biodegradable Anti-Biofouling Coating with Eco-Friendly Protection for Marine Life

Sharir Aizat Kamaruddin, Mohd Rasydan Jalil, Muhammad Aliff Iskandar Samsamalkan, Muhd Amirul Asyraf Abdul Halim, Mohammad Nurfaisal Zainuddin, Khairul Naim Abd Aziz & Zamzila Erdawati Zainol

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Abstract - Conventional marine antifouling coatings contain toxic materials such as copper and organotin which are predominately responsible for the major ecological damage and are facing restrictions. This disaster needs designing an effective, non-toxic alternative to these harmful substances. Here we present a conceptual biodegradable anti-biofouling coating called BioShield Paint that will provide last minute, reliable, and cost-effective protection on marine assets. BioShield Paint contains a synergistic breakthrough in design by having a biodegradable polymer matrix and naturally derived, non-toxic antifouling agents. We designed the product to prevent the adhesion of marine organisms by having multiple pathways of non-toxic foul-release mechanisms and having a zero amount of hazardous materials that would enter the ecological system. This article is a literature review of the science surrounding biofouling processes and environmental, non-toxic antifouling alternatives such as bio-based materials and fouling-release or slippery surface coatings while forming a scientific basis for this project. The project will consider biodegradable VS non-biodegradable materials to confirm the potential for biodegradable materials for the basis of a new generation of sustainable antifouling products to protect marine vessels and the marine environment.

Natural Mosquito Repellent Spray

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SJKT Ladang Glenealy

Abstract - Mosquitoes are among the most dangerous insects, acting as carriers of life-threatening diseases such as dengue, malaria, and chikungunya, which continue to pose serious health risks in many regions of the world. Chemical-based repellents are commonly used as a preventive measure; however, they often contain harsh substances that may cause skin irritation, allergic reactions, and long-term environmental pollution. In response to these challenges, this study focuses on the development of a Natural Mosquito Repellent Spray using plant-based ingredients such as lemongrass, citronella, and eucalyptus oils. These essential oils are scientifically proven to repel mosquitoes effectively while remaining safe, eco-friendly, and gentle on human skin, including that of children and individuals with sensitivity. The spray provides dual benefits by offering mosquito protection and aromatherapy effects, as its pleasant fragrance creates a refreshing and soothing experience for users. Unlike conventional repellents, this formulation avoids toxic chemicals, reduces the risk of adverse health effects, and minimizes environmental impact. The product also presents economic advantages, as the use of natural ingredients lowers production costs and improves profit margins, while its eco-friendly nature enhances market appeal among health-conscious and environmentally aware consumers. Furthermore, the spray can be marketed widely to households, schools, hospitals, and the travel industry, with strong potential for international expansion given the rising global demand for organic and sustainable products. Overall, the development of this Natural Mosquito Repellent Spray represents an innovative, safe, and sustainable solution that not only reduces mosquito-borne diseases but also supports environmental conservation and promotes public awareness of natural alternatives.

Dagmar FE Bomb: A Compact Fire Suppression Grenade Revolutionizing Rapid Response in Enclosed Spaces

Sharir Aizat Kamaruddin, Muhammad Atif Darwish Muhammad Akhir, Muhammad Iqbal Mohamed Zakuan, Nasharuddin Aufa Muhamad Nadri, Muhammad Adam Darus, Khairul Naim Abd Aziz & Muhammad Akmal Roslani

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Abstract - This article introduces the Fire Extinguisher Bomb, fire suppression device that’s shaped like a round bomb but functions like a foam extinguisher, intended for use in enclosed spaces. Unlike traditional fire safety devices, which are supposed to also protect against fuel and electrical fires but are often late to respond and ineffective, the FE Bomb combines AFFF-AR foam with a smart, sensor-based activation system to instantly tackle the problems of late response and ineffectiveness. The device’s video cameras and sensors not only detect fires but also identify the fire type in real time, enabling the selective and timely deployment of the foam to put out the fire. The system is dependable and meets safety regulations because of the structured approach that was taken and included research, basic design, prototyping, and testing. The survey indicates minimal marketing is required since 77% of potential customers showed interest, with the automatic activation receiving the most attention. The FE Bomb has the potential to redefine intelligent fire safety solutions as a passive system, eliminating user action, for apartments, corporate offices, and even municipalities.

EXO-Fin Leg Brace: A New Generation of Spring-Loaded Fins Enhancing Mobility for Weakened Legs Underwater

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Abstract - The structural struggles of underwater propulsion frequently prevent individuals with weak legs from participating and make swimmers tired. In order to increase thrust, conventional diving fins mainly use physical power and provide minimal compensatory support during the kick cycle's recoveries phase. This book presents EXO-Fin Leg Brace: New generation of spring-boosted fin for weak leg mobility in underwater, an innovative EXO-Fin Leg Brace device that is designed to recycle passive energy to transform aquatic activity. The primary structure uses elastic or spring-loaded energy bands made of durable, saltwater-resistant materials like innovative Kevlar-elastic bands or marine-grade stainless steel springs. These parts are carefully built into a lightweight leg brace to store mechanical energy when the diver bends their leg and release it during leg stretching, increasing the kick without demanding more effort from the muscles. For divers with disabilities like muscular dystrophy, partial paralysis, or those recovering from an injury, this innovative approach provides a significant benefit, allowing for increased endurance, improved mobility, and easier access to a variety of underwater environments. EXO-Fin Leg Brace promises a more accessible and less taxing underwater experience for a variety of consumers by successfully addressing significant shortcomings in current supportive diving systems.

LumenTalk: An Advanced Integrated Light and Communication Mask for Safer Diving

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Abstract - Underwater diving often faces challenges related to limited visibility and ineffective underwater communication, which can significantly affect both safety and diver performance. Existing full-face diving mask has limitations in providing multifunctional solutions to these problems. The LumenTalk Mask is an innovative full-face diving mask directly design to address these issues through an integrated technological solution. It incorporates several advance features including, waterproof microphone for clear voice transmission, Bluetooth connectivity for reliable wireless communication, strategically positioned side speakers to enhance audio reception and a powerful LED lighting system embedded around the lens for clearer vision in low-light conditions. The mask is made from lightweight, water-resistance and durable materials such as tempered glass for the lens and silicone gasket to ensure comfort, safety and durability. To ensure user demand and practically, a survey was conducted among 54 participants. Survey results further show a strong interest for these features with 68.5% of respondents emphasizing the usefulness of the microphone and 75.9% respondents identifying integrated lighting as very useful, highlighting the value of multifunctional design. These findings suggest that the LumenTalk Mask could fit wide range of users such as professional divers, recreational divers and underwater photographers. Hence, by combining essential safety and operational aspects into a single design, this study underscores the potential of LumenTalk Mask in improving diving efficiency while remaining affordable and user-friendly for modern underwater exploration.

MarisSafe Watch: An Advanced Safety Watch Made for Open Water Divers in Emergency Situations

Sharir Aizat Kamaruddin, Nur Ain Naslynn Natasya Muhamad Nasir, Jasmin Hanisah Manap, Iman Nurizzati Mohd Hatta, Ayra Humayrah Shahrazel, Khairul Naim Abd Aziz & Aziani Ahmad

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Abstract - This paper will present the development and applications of MarisSafe, a floating safety watch designed for divers, showing how integrated safety technologies can improve emergency response, location tracking, and underwater communication. The main goal will be to show how the combination of satellite connectivity, biometric surveillance, and floating properties of the MarisSafe will be able to add safety to divers in a recreational and professional situation. The gadget has a safety alarm and SOS button, and shares heart rate and oxygen level data to other users through satellite communication, and an EPIRB-inspired tracker will present the precise global location. Morse code vibrations and voice calls are provisions for Morse code distress signals to get help in time. Critical data is saved during incidents in a built-in black box, which helps analyze an event after it has occurred and make safety enhancements. The design is centered around strength and comfort with strength being achieved by using glass-filled polycarbonate, a soft silicon strap, and EVA foam to assure buoyancy in case it is dropped. This ensures clear visibility with a hard-coated acrylic or polycarbonate lens, clear straps, and high contrast dials to make reading easily underwater. Based on the functionality mentioned, MarisSafe can solve the major safety issues that divers deal with, including finding distressed people and guaranteeing interaction in isolated locales. Finally, complemented with the philosophy of remaining safe, afloat, and in touch in any diving situation, MarisSafe provides a novel, stable, and globally networked safety system.

NeoFloat: Smart Innovative Life Jacket for Personal Water Safety and Emergency Rescue

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Abstract - Drowning is still a serious public safety issue, frequently brought on by ineffective life jackets. The NeoFloat smart life jacket was created to improve emergency response and personal safety when engaging in water activities. Key components of this innovation include a waterproof camera installed on the chest for documentation, a sturdy strobe pocket light for visibility, neoprene insulation to lower the risk of hypothermia, and a QR code with medical and personal information to help rescue crews. In order to facilitate faster and more effective rescues, a Global Positioning System (GPS) tracker is also integrated to offer real-time location data. 39 respondents, including both regular and seldom users, expressed substantial approval for these measures, with 64% of them believing they would greatly increase safety. NeoFloat may reduce fatalities, improve rescue efforts and raise the bar for water safety gear, according to research findings. Biometric monitoring, automated light sensors, sophisticated thermal textiles, and live streaming cameras are possible future advancements.

The Deep: Self-Power Heated Swimsuit for Cold Resistance

Sharir Aizat Kamaruddin, Muhamad Alif Aqmar Dani, Muhammad Myrza Ariff Chek Talib, Muhammad Syakir Sazimi, Mohd Haris Zikri Mohd Shahril, Khairul Naim Abd Aziz & Rosnani Nazri

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Abstract - The Deep: Self-Power Heated Swimwear is an innovative technology in swimwear that has been created specifically for use in cold-water conditions where the possibility of hypothermia, discomfort, and other life-threatening health complications are frequent problems faced by scuba divers. In contrast to regular swimwear that is mostly exposed to extreme weather conditions, this design retains body heat management and is more comfortable while submerged. The three-layer construction swimsuit has a hard outer cover for protection, liquid heat inner cover for efficient heat transfer, and soft inner lining near the skin for comfort. The handy heating control system is in the forearm in a manner that divers can conveniently manage the indicator and the switch and view them comfortably without impairing movement. For maximum safety, the suit has an automatic shut-off mechanism to prevent overheating to protect users from harm due to prolonged exposure to heat. Not only does this technology have practical utility, but it also contributes to promoting sustainability in the sense that it presents a self-sustaining heat system with minimal dependence on external power. Its multi-functionality enables it to be appropriate to a broad variety of uses ranging from recreational diving, combat missions in hostile waters, and rescue missions where heat retention is essential to safety and survival efficiency. With safety, sustainability, and innovation integrated, The Deep is better than traditional swimwear technologies since it provides an effective and reliable method of improving performance, endurance, and customer satisfaction in cold water.

Enhancing Student Well-being Before Counseling: Leveraging Mood Booster Apps for Optimal Outcomes (My Mood Booster Apps)

Robson Jok Laeng

Kuching Vocational College

Abstract - This study explores the pivotal role of students’ mood prior to counseling sessions and its impact on counseling effectiveness. Emotional readiness influences engagement, guides counselors’ choice of strategies, enhances receptivity, and strengthens therapeutic rapport. The paper reviews literature on the use of digital mood-tracking applications, highlighting their benefits in fostering self-awareness, enabling real-time emotional assessment, and supporting personalized interventions in educational contexts. Grounded in Rogers’ person-centered theory and Fredrickson’s broaden-and-build theory, the study underscores how mood awareness enhances counseling outcomes by broadening cognitive resources and aligning interventions with students’ emotional states. While mood-checker applications show promise in improving counseling efficiency and early risk detection, ethical challenges such as privacy, data security, and over-reliance on technology remain concerns. The paper advocates for integrating mood assessment into counseling practice, equipping counselors with mood-sensitive strategies, and aligning interventions with Sustainable Development Goals related to health, education, and equality. Future research should examine long-term effects, cross-cultural applicability, and the integration of emerging technologies. Overall, prioritizing students’ emotional readiness significantly enhances counseling success and promotes holistic student well-being.

KitKePS (Kit Kebun Pendidikan Sekolah/School Educational Garden Kit)

Nazurah Mohd Darus, Lily Hafidza Muhamad Izaha, Zalida Zakaria & Aina Syahirah Abdul Hamid

Sekolah Kebangsaan Balun Bidai

Abstract - Mastering Science Process Skills (SPS) is crucial in nurturing scientific understanding among primary pupils. Yet, many struggle with identifying variables, which hinders their ability to make accurate observations, inferences, hypotheses, and conclusions. This challenge often stems from the lack of engaging, contextual, and hands-on learning tools that connect science to real-world experiences. To address this gap, the School Educational Garden Kit or Kit Kebun Pendidikan Sekolah (KitKePS) was developed as an innovative, eco-friendly, agriculture-themed science kit designed to enhance SPS mastery in a fun and meaningful way. Co-designed with four experienced Science and Mathematics teachers, KitKePS provides pupils with opportunities to investigate variables through planting activities. The kit includes seeds, natural fertilisers, planting soil, polybags, simple measuring tools, and record-keeping materials, supported by QR-code accessible SPS-based questions for formative assessment. Pupils manipulate different variables such as fertiliser type, seed variety, water quantity, or sunlight exposure while developing skills to construct inferences, hypotheses, and conclusions through inquiry-based learning. For pilot testing, 15 Year 5 pupils of mixed abilities from a school in Perak Tengah, Malaysia, engaged with KitKePS over four weeks. Findings revealed significant improvements in pupils' ability to identify variables and complete SPS tasks. Beyond skill mastery, KitKePS fosters engagement, critical thinking, problem-solving, and environmental responsibility. This study highlights the potential of KitKePS to bridge classroom science with authentic, hands-on experiences. Future research should explore its scalability, adaptability, and long-term effects across more diverse school contexts.

FaceFits: A Face Shape Classification App for Hairstyle Selection and Recommendation

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Universiti Teknologi MARA Terengganu

Abstract - This project introduces FaceFits, a mobile application that uses artificial intelligence to help users select a suitable hairstyle. The app employs the YOLOv8 algorithm, trained on the Kaggle face shape dataset, to classify a user's face shape (oval, round, or square) and then uses the Gemini API and YouTube Data API to provide personalized hairstyle recommendations and tutorials. Developed with Flutter and an adapted Waterfall Model, the system achieved a classification accuracy of 57.6% and an excellent user satisfaction score of 83.36 on the System Usability Scale (SUS). While acknowledging limitations in model accuracy, this project demonstrates the potential of integrating machine learning and mobile technology to provide effective, data-driven grooming guidance.

The Little Hydro Garden: Cultivating Environmental Awareness, Healthy Eating Habits and Moral Values among Preschool Children Through Hydroponics

Yeow Pei Wen, Fong Kok Fei, Chong Hean Long, Choo Poi Kuan & Fun Yoke Ping

SJK(C) Perak

Abstract - This project was conducted to instil environmental awareness, healthy eating habits and moral values among preschool children aged four to five. The impetus arose from the observation that young children often exhibit minimal understanding of environmental concerns and are generally unwilling to eat vegetables, which are crucial for their growth and health. Building upon the framework provided by the Malaysia Preschool Curriculum Standard (KSPK), which emphasizes holistic development through exploration, inquiry and moral education, this project incorporated hydroponic vegetable cultivation as a hands-on learning approach. The objectives encompassed cultivating environmental awareness, foster positive attitudes towards vegetable consumption and promote moral values of responsibility and sharing. In this project, children engaged directly in planting, observing and caring for vegetables, followed by harvesting and consuming the produce during meals, with surplus vegetables shared with parents. The findings revealed that students were highly enthusiastic for the entire process, eagerly tracked plant growth and anticipated the harvest with great interest. Notably, they showed a great willingness to consume vegetables, attributing their preference to the sense of ownership derived from cultivating the plants themselves. Furthermore, children showed pride in sharing the harvested vegetables with their families, reinforcing values of cooperation and generosity. This project clearly aligns with several United Nations Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-being), SDG 4 (Quality Education), SDG 12 (Responsible Consumption and Production) and SDG 15 (Life on Land). Integrating hydroponic brought sustainable practices into the classroom, offering students hands-on experiences that fostered lifelong habits. The findings suggest that experiential environmental education is a powerful way to promote healthier lifestyles, environmental awareness and positive social values in young learners.

A Comparative Evaluation of Wind Turbine Blades with Flow Control Methods

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Universiti Sains Malaysia

Abstract - The current research aims to examine the lift and drag performances of different flow controls, namely, a Gurney flap, guided vane, microplate, slat and spoiler operated at fixed parameters. A numerical model was initially developed and validated against previous experimental and numerical studies. The validated model was modified and attached with the flow control methods. The slat achieved the highest performance, with an improvement of up to 27.35%, followed by the microplate, Gurney flap, guided vane and spoiler.

An Interactive Web-Based Application for Grid-Connected Photovoltaic System Sizing

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Universiti Kuala Lumpur Malaysian Institute of Technology

Abstract - The global demand for renewable energy is increasing, and solar power has become one of the most promising solutions to reduce reliance on fossil fuels. Grid-connected photovoltaic (GCPV) systems are widely used, but one of the biggest challenges for homeowners and users is determining the correct system size. If the system is too large, costs become unnecessarily high, while if it is too small, the energy demand cannot be met. This project introduces an interactive web-based application designed to simplify the sizing process for GCPV systems. Real data was collected from a single-storey residential house in Taman Universiti, Parit Raja, Johor, based on one year of electricity bills from Tenaga Nasional Berhad (TNB). The data was used to calculate energy demand and determine the appropriate PV system size. Manual sizing calculations were also performed to serve as a benchmark for comparison with the developed web app. The application provides a user-friendly, step-by-step process where energy consumption and component details can be entered, and the system automatically calculates the optimal number of solar modules required. In this case study, the final recommended system size was seven modules (≈3.15 kWp), which matches the household's annual energy demand of around 3634 kWh. The comparison with manual calculations shows that the web app produces accurate and reliable results while being faster and easier to use. By preventing over-sizing and under-sizing, the tool provides an efficient solution that makes solar adoption more practical, affordable, and accessible to everyday users.

SAMUDERAMAPS: GIS-Driven Water Quality Mapping for Coastal Sustainability

Sharir Aizat Kamaruddin, Khairul Naim Abd Aziz, Aziani Ahmad, Eliy Nazira Mat Nazir, Nur Syafiqah Rahim & Nur Khairani Kamarudin

Universiti Teknologi MARA, Perlis Branch, Arau Campus

Abstract - Water quality maps can be used strategically to safeguard the environment in the coastal and marine ecosystems and for sustainable marine fisheries and coastal tourism. Water quality maps are currently scarce, particularly in Malaysia's northern regions. SAMUDERAMAPS has been developed to achieve the aspiration of marine ecosystem conservation and improving economic profits for rural communities. SAMUDERAMAPS was created by integrating current water quality data and geospatial technology. SAMUDERAMAPS is a readymade product consisting of water quality maps of physicochemical water parameters, including water nutrient parameters covering the area of Sungai Kilim, Pantai Kok, Pulau Dayang Bunting, Pulau Tuba and Sungai Merbok, Kedah and recently coastal waters of Kuala Perlis, Perlis. SAMUDERAMAPS has a selection of maps in both paper and digital formats that will appeal to a wide range of purchasers, including social-economic players and local communities, at a fair price. In terms of contribution, SAMUDERAMAPS can assist environmentalists in monitoring water quality levels in inaccessible locales or areas with high biodiversity. Furthermore, SAMUDERAMAPS can be used for site-selection analysis for the sustainable development of mariculture areas, coastal tourism, and fishing hotspots. SAMUDERAMAPS is aligned with the United Nations Sustainable Development Goals, especially SDG 14 – Life below water, SDG 2 – Zero hunger, SDG 3 – Good health and well-being, and SDG 13 – Climate action.

Digital GenWealth Robo-Adoption Model (DiGRAM)

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Universiti Teknologi MARA

Abstract - The adoption of robo-advisors is becoming increasingly vital; however, the number of active users remains low, particularly in terms of financial literacy. This research employs the Unified Theory of Acceptance and Use of Technology (UTAUT) to investigate the effects of performance expectancy, effort expectancy, social influence, and facilitating conditions, with financial literacy serving as a moderating variable. The primary aim is to develop a Digital GenWealth Robo-Adoption Model (DiGRAM) for Malaysian investors to accelerate the adoption of digital wealth management. A quantitative methodology was utilised, focusing on individuals between the ages of 18 and 45 with diverse levels of experience in digital investing. Through purposive sampling, 267 valid responses were obtained via online questionnaires and processed using the Statistical Package for the Social Sciences (SPSS) and Structural Equation Modelling-Partial Least Squares (PLS-SEM). Hypotheses were evaluated at a significance level of 0.05, with a one-tailed critical value of 1.645. The results indicate that performance expectancy, social influence, and facilitating conditions considerably increase the propensity to adopt robo-advisors, whereas effort expectancy has no substantial impact. Financial literacy enhances the beneficial impacts of performance expectancy and social influence; however, it does not modify the negative correlation between effort expectancy and intention. This indicates that performance expectancy and social influence exert a greater impact on robo-advisor adoption than effort expectancy. The research elucidates the factors influencing robo-advisor usage and emphasises financial literacy as a crucial moderator. Insights offer a comprehensive framework for financial institutions, politicians, and scholars to promote digital wealth adoption in Malaysia. Future research should encompass ongoing development by incorporating emerging aspects in robo-advisory services.

Flipflap Clothes Folding Board Using 3-Dimensional Cartoon Characters as a Strategy for Exposing Children to the Crafts of Folding Their Clothes

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Universiti Islam Antarabangsa Tuanku Syed Sirajuddin

Abstract - Folding clothes sounds easy and an activity that is considered light for some people, but this activity can increased stress in family relationships if only done by parents. In fact, if someone tries to help but the results are unsatisfactory, there is also the potential for increased stress because parents have their own way of folding clothes as mentioned by Nurellyanaabu in Lemon8, 2024. In another perspective, this activity can lead to other issues such as communication and understanding which are very important within the family, especially between parents and children. In addition, it is also stated that there are different techniques of folding clothes with several criteria including speed, cleanliness, beauty, and even neatness of the cloth folding. Fairytaleho (2020) states that life is tiring, with one of them being the pile of clothes that need to be folded. The effort to produce clothes folding board is one of the initiatives for cloth folding but children are yet to be interested enough to use them as a tool for folding clothes but rather for other usage. Therefore, the clothes folding board named Flipflap with the suggestion of using 3-Dimensional (3D) cartoon characters has been done by researchers who found that this effort has the potential to be developed as a real product in the future.

Longinate - Nature Reinforced, Waste Reimagined

Prof. Ts. Dr. Hii Siew Ling, Chieng Yuan Ya, Ts. Koh Chen Chung, Rachel Chai Mei Yan & Dr. Woo Kwan Kit

University of Technology Sarawak

Abstract - With growing environmental concerns over the persistence of petroleum-based plastics, the need for sustainable, biodegradable alternatives has intensified. Sodium alginate, derived from seaweed, offers promise but suffers from stiffness, brittleness, and moisture sensitivity. Despite its biodegradability, alginate-based bioplastics are limited by poor mechanical flexibility and water resistance, restricting their application in practical packaging. This study aims to enhance the functional properties of alginate films by incorporating longan peel (LP), an underutilised agricultural by-product rich in polyphenols and natural polymers. The innovation, branded as Longinate, involves formulating biodegradable films by blending sodium alginate with varying concentrations of LP. Comprehensive analyses were conducted, including film thickness, morphology, mechanical strength, solubility, swelling, water vapor permeability, and chemical interactions via FTIR analysis. The incorporation of longan peel into the alginate matrix enhanced film performance by reinforcing the polymer network and modifying microstructural characteristics. This led to improved mechanical integrity, flexibility, and moisture resistance - key criteria for packaging applications. The presence of natural fibers and polyphenols in longan peel contributed to reduced water solubility and permeability, while maintaining material biodegradability. This innovation supports the valorisation of agro-industrial by-products and offers a scalable, eco-friendly alternative to conventional plastic packaging. Longinate demonstrates that longan peel can effectively reinforce alginate bioplastics, improving strength, flexibility, and moisture resistance. This sustainable packaging innovation contributes to environmental protection while valorizing agricultural waste for industrial applications.

CocoBriq-The Multifunctional Briquettes

Fatimah Binti Haji Saidin, Muhammad Haikal Hakim Bin Adanan, Ayu Nurnazirah Binti Mohd. Aidi & Nur Sofia Aliya Binti Zul Hisham

Politeknik Tuanku Sultanah Bahiyah

Abstract - This project is carried out to produce briquettes made from coconut shells, cooking waste, and fallen palm kernel husks as a green energy alternative. These briquettes are more sustainable than traditional charcoal and safer for the environment compared to cooking gas. Fallen palm kernel husks are one of the agricultural wastes that exist in large amounts in Malaysia. However, many of them are not used properly and are often burned in the open. This action causes air pollution and wastes resources that actually have economic value. Through this project, palm oil husks are processed into briquettes that are clean, produce less smoke, and can be mixed with additives to increase their market value. These briquettes can also be combined with natural herbs to work as insect repellents and give a pleasant aroma when used. The main target markets are households, street food vendors, grilled fish restaurants, and recreational users such as campers. This project also supports the economy because it produces value-added products from cheap raw materials. At the same time, this project supports the Sustainable Development Goals (SDGs), such as SDG 7 (Clean Energy), SDG 12 (Responsible Production), SDG 13 (Climate Action), and SDG 8 (Economic Growth). Overall, this project gives benefits to the economy, society, and the environment.

ALUMONGER

Iman Zulfa Binti Mohd Saharudin, Nur Zhafirah Dzihni Binti Mohd Faizal, Intan Wardina Adawiyah Binti Abdullah, Afif Wafi Bin Dahlan @ Zul Dahlan & Nurul Atikah Binti Azmi

Kolej Matrikulasi Perlis

Abstract - Alum, or known as "tawas" in Malaysia is traditionally used to clean dirty well water. In this industrial generation, most body soap produced contains harsh chemicals, artificial fragrances, and synthetic additives that may irritates the skin. It is because these materials are cheaper and faster to produce to fulfill today's high demand of body soap. To address this, ALUMONGER was developed as a natural bar soap made from alum, lemon, and ginger. Alum (Potassium Aluminium Sulfate) can reduce hyperpigmentation and dark spots by exfoliating the skin and promoting the turnover of dead skin cells thus providing a brighter complexion. ALUMONGER's aim is to provide a gentle and effective cleansing product that is free from harsh chemicals, artificial fragrances, and synthetic additives. Ginger (Zingiber officinale, Zingiberacae) contains anti-oxidant and anti-inflammatory properties. In addition, a mild use of lemon (Citrus limon) also acts as an additional ingredient in the soap. On top of that, according to Oussama Bekkouch, extraction of ginger and lemon also showed anti-inflammatory activities. Beyond that, another aim in developing ALUMONGER is to encourage sustainability and minimize environmental harm to ecosystems during production, use, and disposal. Alum, lemon and ginger are used as materials as they are abundant. The method used to make ALUMONGER is "rebatching". Additional ingredients such as ginger extract and lemon extract is mixed into the alum soap and remolded into new shapes and colors. The result of innovation gets a utilized bar soap. The resulting soap can make the skin softer and brighter and a frequent use of the soap needed to be taken to fade the dark spots areas completely. In conclusion, ALUMONGER can be produced from a mixture of alum soap, lemon and ginger extract. The results can be used in daily life.

KIA G-NOSIS KIT

Ahmad Afandi Bin Yusri & Dr. Muhammad Zuhair Bin Zainal

Universiti Sains Malaysia

Abstract - This study developed a teaching aid kit for compound words, especially in figurative compound nouns for Malay language teachers, integrating games, local wisdom, and 21st-century skills. It employed a modified design and development approach in three phases (Padzil et al., 2021). The study involved three phases: needs analysis, design and development, and usability evaluation. The first phase used semi-structured interviews with five teachers from the School Cluster of Excellence. The second phase involved the Fuzzy Delphi technique with eleven expert panels to reach a consensus on eight kit elements: kit objectives, learning objectives, Needham's Five Phase Constructivism Strategy, game elements, local wisdom, 21st-century skills, media resources, and evaluation. The third phase assessed the kit's usability with ten Expert Teachers by using the USE Model. Findings showed the kit achieved a very high usability level (94.85%) encompassing usefulness (98.57%), ease of use (95.00%), satisfaction (93.33%), and ease of learning (92.50%). This kit has the potential to be used by all primary school Malay language teachers in Malaysia.

Nova Nurse

Sharmithaa A/P Gobi, Lau Jia Xuan, Sharrmita P Manimutthu, Sasvena Vigneshwaran & Nurul Bilqis Binti Baharuddin

Kolej Matrikulasi Perlis

Abstract - Healthcare systems face pressure from rising patient numbers and shortages of trained medical staff. Overworked nurses handle long shifts and high loads, leading to fatigue, stress, and lower care quality. This affects patient outcomes, response times, and staff well-being. Routine tasks like monitoring vital signs and transporting supplies consume much of their time. Robot nurses can perform these repetitive tasks precisely and efficiently, supporting nurses, reducing workload, minimizing errors, and improving patient care. Robot nurses are created by combining Artificial Intelligence and robotics. AI enables the robot nurse to collect and process information that is stored safely. Sensors allow the robot to assess its surroundings and navigate hospital environments effectively. The robot nurse monitors patients' vital signs to ensure they are in normal condition, such as measuring pulse rate and blood pressure. The siren activates to alert nurses when emergency cases arise. Robot nurses assist in documentation by recording doctors' prescriptions during ward rounds, patients' medical history, and specific allergies to medicines. By following the doctor's prescription, they plan a suitable diet for each patient based on their health status, facilitating AI to generate the recipe and send it to the kitchen. This increases efficiency by reducing careless mistakes during documentation. It also reduces nurse burnout, as simple jobs can be handled by robotic nurses around the clock. Additionally, personalized diet plans ensure patients receive enough nutrients, promoting faster recovery. Robotic nurses help address staff shortages and nurse burnout by managing routine tasks with efficiency and precision. They support human nurses through monitoring, documentation, and diet planning, reducing errors and improving patient care. Overall, they enhance hospital efficiency and promote quicker patient recovery.

Keywords: Robot nurse, Robotics, Artificial Intelligence

Chemistree 2.0: A New Approach in Learning Chemistry

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Universiti Malaysia Kelantan

Abstract - Chemistry is one of the subjects that is seen by many learners as a complex and difficult subject to learn, either in schools or in higher institutions. Conventionally, chemistry concept was taught via contemporary ways via lecture, tutorial, and laboratory practice. Students were given printed notes and a manual for the lecture and laboratory. ChemisTree, a novel educational framework that reimagines chemistry learning through the integration of artificial intelligence (AI), augmented and virtual reality (AR/VR), and gamification so that it is not only aligns with 21st-century education goals but also prepares students for STEM-driven futures, offering a pathway towards more interactive, personalized, and sustainable chemistry education.

MEDIHOP

Ong Ming Yi, Cheak Jia Yeng, Lam Jia Jun, Woo Jun Feng & Dr. Norazlina Mohd Darby

Kolej Matrikulasi Perlis

Abstract - In recent years, the incidence of communicable diseases in Malaysia has shown fluctuations, influenced by factors such as overcrowding, climatic conditions, and vector breeding. To combat this issue, several initiatives were made, such as the establishment of the Infectious Disease Research Centre. While prevention remains the most effective approach in managing diseases, it is equally important to have comprehensive plans to address the aftermath of disease outbreak, and prevent further spreading. Another challenge that arises is the difficulty faced by individuals in rural areas in accessing transportation to reach nearby healthcare facilities or pharmacies in order to obtain prescribed medication. Thus, the innovation, a website known as MEDIHOP integrates the concept of “hotspots”, to identify the latest disease outbreak and the nearest healthcare provider based on the user's current location. The disease outbreak detection feature was adapted from the MySejahtera application introduced by the Ministry of Health of Malaysia. However, MEDIHOP advances this concept by additionally providing users with the addresses and contact details of nearby healthcare providers, enabling them to make informed choices based on their current location. Furthermore, the contact information of healthcare centres provided by MEDIHOP offers users the option of having medications delivered or receiving consultations through telemedicine services, solving transportation issues. The objective of MEDIHOP is to serve as a platform to provide universal healthcare, especially in rural areas where the access to healthcare is minimal. Besides that, MEDIHOP also generates awareness among local communities by informing about recent disease outbreaks, increasing the tendency of users to take initiatives to prevent the spreading of the disease. The website is also user-friendly, as the layout and instructions are easy to comprehend. With that, MEDIHOP has the potential to both prevent and mitigate fatal cases, as well as curb the further spread of communicable diseases effectively.

Stress Buddy

Cheng Ee Hinn, Nur Amalina Binti Astar, Ahmad Thaqif Bin Badrul Hisyam, Nur Aqeelah Binti Noorul Ameen, Nur Humairah Binti Hisyamuddin & Suhaila Binti Ismail

Universiti Pertahanan Nasional Malaysia

Abstract - Stress is a pervasive challenge in modern society, often remaining undetected until it impairs well-being and productivity. Most stress management applications depend on self-reporting and provide generic advice, limiting effectiveness during high-stress moments. Meanwhile, wearable devices such as smartwatches collect valuable physiological data including heart rate, skin temperature, and motion, which are seldom used for proactive stress support. This project introduces Stress Buddy, an innovative mobile application that transforms biometric data into real-time adaptive interventions. By continuously monitoring physiological signals, the system distinguishes stress from physical exertion or excitement and delivers contextually relevant interventions such as breathing guides, affirmations, or calming sounds. The design emphasizes Human-Computer Interaction (HCI) principles to ensure intuitive, empathetic, and accessible user experiences. Both low- and high-fidelity prototypes were developed, refined through.

Escape Math

Siti Nur Aqilah Binti Abdul Halim, Nurin Aleya Qalesya Binti Muhaniza, Aqilah Liyana Binti Aznan, Erdena Afeefa Binti Maizatul Akmar & Norfadzliah Binti Yusof

Maktab Rendah Sains MARA Terendak

Abstract - This project, entitled Escape Math, is an innovative educational initiative developed using the Roblox Studio platform with the purpose of making Mathematics learning more interactive, engaging, and enjoyable for secondary school students. The project was inspired by the common challenge that many students face in perceiving Mathematics as a difficult and monotonous subject, which often reduces motivation and interest in learning. By integrating gaming elements with educational content, Escape Math transforms the learning experience into an adventurous escape game where players must navigate through mazes, avoid traps, and unlock doors by solving Mathematics problems correctly. The questions are designed to cover essential topics such as algebra, fractions, geometry, percentages, and basic operations, allowing students to practice problem-solving skills in a fun, stress-free environment. In addition, the immersive features of Roblox, such as 3D environments and interactive scripting, enable the game to provide immediate feedback, which helps students identify mistakes and improve their performance. The project also encourages collaboration and communication among peers when played in groups, fostering teamwork alongside academic learning. For teachers, this game serves as an innovative teaching aid that can complement traditional classroom lessons and offer variety in instructional methods. With its low development cost, accessibility through an online platform, and flexibility to be improved over time, Escape Math has significant potential to enhance both teaching and learning experiences. Ultimately, this project is expected to cultivate students' confidence in answering Mathematics questions, improve their mastery of core concepts, and create a positive perception of Mathematics as an enjoyable and valuable subject.

Optimizing Horizontal Space Utilization and Expanding Green Areas through Urban Planning Based on Nested Regular Polygons Constructed by Connecting Midpoints of the Sides from the First to the n Layer

Siwakorn Soipet, Patcharawat Ueakulwarawat, Wachirathorn Phachuenjai, Papangkorn Yenraksa & Sukanya PlueangThaisong

Rajsimawittayalai School

Abstract - This project investigates the recursive construction of nested regular polygons formed by connecting the midpoints of the sides of an initial polygon with five or more sides. The objective s are 1) to derive generalized formulas for calculating the side length, perimeter, and area at the n-th level of nesting, and 2) to apply these mathematical results in urban planning to optimize horizontal space use and expand green areas, in alignment with Sustainable Development Goal 11 Using geometric reasoning and the Law of Sines, the following formulas were established: Side Length : $l_n = (\sin\theta / \sin\beta)^n \times (l_0 / 2^n)$, perimeter : $P_n = l_n \times k$, Area : $Area_n = l^2_0(\sin\theta/\cos\beta)^{2n}/2^{2k+2}\tan\alpha$, where : l_0 = Side Length of the outermost polygon , n = iteration level, k = number of nested layers , $\theta = (k-2)180/k$, $\beta = 180-\theta/2$, $\alpha = 360/2n$, when applied to urban layouts, this model improves horizontal space utilization by up to 86.4% compared to conventional designs, while also increasing the potential for green space allocation and spatial continuity-key elements for sustainable city planning.

Hydrahub: Community Rainwater Reservoir with Multiple Purpose Hall

Lee Yi Ee, Karen Jong Xin Jie, Yap Choy Yi, Lock Jia Hui, Wong Zhe Xuan, Reese Kong Shien Tzi & Moon Wei Chek

UCSI University

Abstract - Access to clean water is an essential component of urban resilience, yet many communities face disruptions due to pipe bursts, rationing, or maintenance shutdowns, and heavily rely on the public water supply system in Malaysia. During such events, residents are left vulnerable, relying on limited bottled water supplies or temporary relief efforts (eg: built-in domestic water tank). While HydraHub is a community-centered initiative that reimagines existing public spaces as part of the water security solution. By utilizing the roof structure above a community basketball court, HydraHub harvests rainwater and channels it into a centralized reservoir, creating an easily accessible backup water source. The system goes beyond simple water storage by integrating a purification process, with the granular activated carbon serving as the core material for filtration. Activated carbon is highly effective in removing suspended particles, organic compounds, odors, and chlorine residues, producing water that is safer and more suitable for domestic applications such as cleaning, sanitation, and limited non-potable household use. This ensures that harvested water is not only available in times of scarcity but also meets acceptable standards for practical daily needs (except for drinking).In other words, the HydraHub's design emphasizes simplicity, scalability, and sustainability. The infrastructure can be retrofitted into existing courts and community halls with minimal intervention, reducing cost barriers while maximizing utility. By situating the system in a central, familiar community hub, it also fosters a sense of shared ownership and encourages responsible water stewardship among residents. Moreover, the project aligns with broader sustainable development goals by promoting water reuse, reducing dependence on centralized supply chains, and building resilience against the growing threats of climate change and urbanization.

Solar Panel House

Shehsaan Saminadhan, Tharanyaa A/P Sukumar, Kooventan A/L Parameswaran, Thennarsan A/L Parameswaran & Rajaletchumy R.Sinniah

SJKT Ladang Emerald

Abstract - This project focuses on the concept, design, and benefits of a solar panel-powered house. Solar panels, also known as photovoltaic (PV) systems, convert sunlight into electrical energy using semiconductor materials. This electricity can then be used directly to power household appliances or stored in batteries for later use. A typical solar-powered house includes key components such as solar panels, a charge controller, an inverter, and an energy storage system (like lithium-ion batteries).The main goal of the project is to demonstrate how solar energy can reduce dependence on non-renewable resources such as coal and natural gas. By harnessing the power of the sun—a clean and renewable resource—a solar panel house significantly reduces carbon emissions and environmental pollution. Although the initial installation cost may be high, the long-term savings in electricity bills and available government incentives make it a cost-effective solution over time. In this project, we also analyze the efficiency of the solar system by calculating energy input (solar irradiance) and output (electrical power delivered). Factors such as panel angle, orientation, weather conditions, and load demand are considered. The results show that solar homes are highly suitable for sunny regions and can fun.

Onyx AI

Raja Auni Najibah Binti Raja Muhammed, Nurul Atikah Binti Azmi, Lee Xin Qian, Rasyidah Binti Mustafa Raman & Muhammad Ammar Zaim Bin Mohamad Suffian

Kolej Matrikulasi Perlis

Abstract - Motorcyclists remain among the most vulnerable road users, with front-end collisions representing a major cause of accidents. To enhance rider safety, we propose Onyx AI, an AI-Enhanced Smart Helmet designed to provide real-time forward collision warnings. At the core of Onyx AI is a lightweight data fusion platform that integrates a single front-facing camera with an inertial measurement unit (IMU). The system leverages YOLOv8n nano object detection, optimized to run in real time on the Raspberry Pi Zero 2 W, to detect vehicles and pedestrians from the visual feed. These detections are then correlated with the motorcycle's speed and orientation data from the IMU, enabling the system to evaluate contextual risk and minimize false alarms. Unlike cloud-dependent solutions, Onyx AI performs all computation locally on the embedded processor, ensuring sub-second response times without reliance on internet connectivity or subscription services. This makes the solution not only faster and more reliable but also cost-effective and highly accessible. Riders will receive warnings through a clear audio alert system, designed to be immediate and unambiguous, allowing them to react promptly to potential hazards. By combining advanced AI perception with a compact hardware setup, Onyx AI provides a practical, deployable solution that augments human awareness on the road. Ultimately, this innovation aims to democratize access to life-saving safety technology, reducing accident risks for motorcyclists and contributing to safer mobility for all.

SoWin AIoT: Smart Light, Smarter Energy

Ts. Zainolrin Bin Saari, Ts. Suhana Binti Ismail, Siti Farah Binti Hussin & Ir. Ts. Mohammad Syazwan Bin Mohd Asri

Politeknik Mersing Johor

Abstract - AIoT enables this smart lighting innovation to function autonomously in remote and low-light environments, combining artificial intelligence with real-time IoT sensing. The system integrates PIR sensors and IP cameras that detect human or vehicular presence, with data sent over 5G/LTE networks to a centralized Artificial Intelligence Server. The server processes inputs using object detection algorithms and returns control signals that activate, dim, or switch off LED lights according to situational needs. An integrated Long Short-Term Memory (LSTM) model performs time series forecasting of renewable energy generation. The model uses historical solar and wind data along with short-term weather forecasts to predict energy availability, allowing dynamic management of lighting schedules and battery usage. This approach ensures energy efficiency, uninterrupted operation, and load balancing under fluctuating environmental conditions. The energy supply consists of solar panels and a vertical-axis wind turbine, connected to $LiFePO_4$ batteries for storage. A Raspberry Pi unit serves as the edge gateway, handling sensor data aggregation, relay control, and secure transmission. A cloud dashboard visualizes system diagnostics, forecast outputs, and performance analytics, enabling remote monitoring and decision support. This AIoT-powered innovation addresses lighting needs in off-grid rural settings, construction zones, and disaster-affected areas, ensuring visibility, energy autonomy, and reduced carbon emissions. Combining intelligent sensing, predictive analytics, and renewable energy integration, the system delivers a scalable, low-maintenance solution for sustainable and resilient infrastructure.

Nourish to Flourish: Preventing Anemia Among Young Woman

Nurul Fatihah Binti Sijurit@Zuraid & Rosazila Binti Abd Rashid

Politeknik Tuanku Syed Sirajuddin

Abstract - Anemia, primarily caused by iron deficiency, remains one of the most pressing health issues affecting young women worldwide. This condition not only leads to fatigue, poor concentration, and reduced productivity, but also poses long-term risks to physical and mental well-being. Addressing this challenge requires innovative approaches that can effectively communicate health messages to a younger audience in an engaging and relatable manner. This project introduces "Nourish to Flourish: Preventing Anemia Among Young Women", an innovative Public Service Announcement (PSA) delivered through animation as its primary medium. The PSA animation employs colorful visuals, character-driven storytelling, and simplified infographics to highlight the importance of nutrition in anemia prevention. Key messages focus on the consumption of iron-rich foods such as spinach, chicken liver, and legumes, combined with vitamin C–rich fruits to enhance iron absorption. The animation also educates viewers on simple lifestyle adjustments, including reducing tea and coffee intake after meals, which may inhibit iron uptake. By presenting complex health information in a visually appealing and easily digestible format, the animation ensures higher retention and understanding among young women. This innovation not only raises awareness but also encourages behavioral change, empowering young women to take proactive steps toward healthier nutrition. Ultimately, the project demonstrates the potential of PSA animation as an impactful educational tool that bridges the gap between health knowledge and daily practice, supporting broader public health goals at community and national levels.

Aurelia Skin Scrub

Muhammad Nazrin Bin Faizolmizam, Hurin Yasmin Binti Fudzly, Nur Liyana Soffia Bt Azhar, Nursyafiqah Binti Norizan & Md. Ashraf Bin Mohamed

Politeknik Tuanku Sultanah Bahiyah

Abstract - Aurelia Skin Scrub represents an innovative skincare formulation, functioning as both a facial and body exfoliant, derived from recycled tea residue. What makes Aurelia Skin Scrub unique is its use of 100% natural ingredients and a production process that prioritizes environmental sustainability. The formulation combines dried tea residue with natural ingredients such as brown sugar or Himalaya salt, coconut oil, natural vitamin E, and essential oils such as lavender or peppermint, which provide both refreshing effects and additional skin benefits. This product was introduced in response to the growing demand for healthier and eco-friendly lifestyles, as most beauty products in the market still contain synthetic substances and plastic microbeads that negatively impact both skin health and the environment. Through this innovation, Aurelia Skin Scrub not only helps users achieve softer, cleaner, and healthier skin but also supports the reduction of organic waste. The antioxidants present in tea residue function to protect the skin against free radical damage, thus enhancing the health benefits of the product. The production process is simple yet controlled, ensuring quality and stability without synthetic preservatives, while maintaining a shelf life of four to six months. Packaged in airtight containers, it is recommended to be used with a small spatula to prevent cross-contamination. In conclusion, Aurelia Skin Scrub is an innovative beauty product that integrates health, sustainability, and economic value. It not only benefits the skin but also educates society on the importance of reusing organic waste towards a more eco-friendly lifestyle.

Life Insurance Ownership Factors Lapse Status and Insurance Literacy Consideration in Klang Valley

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Universiti Kebangsaan Malaysia & Universiti Teknologi MARA Negeri Sembilan

Abstract - Life insurance plays a crucial role in household financial protection, yet Malaysia continues to face challenges of low penetration and high policy lapse rates despite national initiatives such as Perlindungan Tenang. While socioeconomic and behavioural factors have long been recognised as important determinants of insurance ownership, the role of insurance literacy, a construct distinct from general financial literacy remains underexplored. Insurance literacy encompasses knowledge of policyholder rights, duties, product benefits, risk disclosures, and risk management strategies, all of which may influence ownership and policy continuity. This study develops and validates a multi-dimensional insurance literacy construct and examines its relationship with life insurance ownership and lapse behaviour in Klang Valley, Malaysia. Using a quantitative cross-sectional survey, data were analysed through Partial Least Squares Structural Equation Modelling (PLS-SEM) with Multi-Group Analysis (MGA). The results confirm the reliability and validity of the insurance literacy construct and demonstrate significant associations between literacy, perceived product benefits, trust in insurers, and purchase intention. While attitudes, trust, and perceived benefits consistently drive intention across groups, literacy plays a stronger role in reducing perceived risks and building trust among non-lapsed policyholders. The findings contribute to the insurance literature by (i) empirically validating a new insurance literacy construct, (ii) highlighting its mediating role in behavioural models of purchase intention, and (iii) identifying group-specific differences in literacy effects. These insights offer practical implications for policymakers, insurers, and educators in designing targeted literacy initiatives to enhance retention, reduce lapses, and strengthen Malaysia's insurance sector.

e-Photography (AIS)

Ts. Noorsyafila Binti Zulkafli, Irzaharyantie Binti Bustami, Jamaluddin Hakimi, Avril Ilham Bin Hasnol Hisham & Nurdania Asyiqin Binti Mohd Nordin

Kolej Vokasional Kuala Selangor

Abstract - Online learning platforms are increasingly gaining attention and becoming a catalyst in teaching and learning (PdPC). Therefore, educators should consider effective teaching techniques in addition to improving the quality of existing methods. Accordingly, this interactive learning material was developed to support teaching and learning for Year 1 students of the Diploma in 3D Animation Technology program for the course DDA 1213 Basic Photography. This material helps students master photography techniques through the use of appropriate Aperture, ISO, and Shutter Speed settings. Students' understanding of these techniques is very important in producing high-quality photographs. Hence, this product was developed as an added value to the rapidly growing digital learning resources available today. The term AIS is also used to encourage students to remember the learning content. The development study of this product was successfully conducted with the participating respondents. A total of 30 Year 1 students from the Diploma in 3D Animation Technology program provided positive feedback. Based on the overall mean score, the findings reached a high tendency level of 4.8, referring to the Likert scale (Landell, 1997). Therefore, the development of this product not only impacts the respondents but is also capable of making a long-term impact on users with an interest in the world of photography.

Dry Notes

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Kolej Matrikulasi Perlis

Abstract - The growing demand for paper has contributed to deforestation, creating the need for new raw materials that are sustainable and environmentally friendly. Dry Notes is an innovation project that focuses on making paper from dry leaves, which are often ignored as waste but can be turned into a valuable resource. This project not only helps reduce waste but also teaches students to care for the environment through creativity and recycling. The process of making eco-paper involves several stages. First, dry leaves are collected and washed to remove dust and insects. Next, the leaves are boiled until they become soft and easy to break down. The softened leaves are then blended with water into a smooth pulp. This pulp is spread evenly on a wooden frame, pressed firmly to remove excess water, and finally dried under sunlight until strong sheets of paper are formed. The finished eco-paper can be used for writing, drawing, or craft projects. The aim of this project is not to produce paper that is the same as factory-made paper, but to create functional, eco-friendly sheets that can be used for educational and creative purposes. Beyond producing an alternative material, the project provides hands-on learning that strengthens problem-solving, teamwork, and innovation skills among students. It also raises environmental awareness within the academic community and shows how small-scale solutions can contribute to larger sustainability goals. By turning waste leaves into useful paper, Dry Notes demonstrates that simple innovations can make a big difference in reducing deforestation and promoting eco-friendly lifestyles.

MenHea: Mental Health

Nur Hidayati Binti Kamarudin, Muhammad Akmal Bin Mohd Hilmi, Mia Aishah Solehah Binti Mashuri & Suhaila Binti Ismail

Universiti Pertahanan Nasional Malaysia

Abstract - Mental health challenges such as stress, anxiety, and depression are increasingly prevalent across the world, with young adults being particularly vulnerable. Limited access to professional help, combined with stigma and cost barriers, contributes to delayed treatment. In response, digital health technologies have emerged as promising tools for supporting mental well-being. This paper presents MenHea, a mobile application prototype designed to empower users in managing their mental health through artificial intelligence (AI) and self-reflection tools. The app concept integrates real-time stress detection through face scanning, voice journaling for emotional release, personalised AI-driven feedback and a supportive community platform. The prototype was developed as an academic project and evaluated through lecturer feedback, focusing on innovation, usability and relevance. Initial evaluations highlight that MenHea offers a unique contribution compared with existing applications such as Headspace, Calm and Wysa by combining AI-driven stress detection with social support features. While still at the conceptual stage, MenHea demonstrates the potential of AI-enhanced mobile tools to contribute to early detection, reduce stigma and foster resilience in everyday life. Future work will involve refining the prototype, enhancing AI accuracy, and exploring integration with mental health professionals to increase reliability and impact.

Feeling Forest – AR Storytelling Card

Rosazila Bt Abd Rashid

Politeknik Tuanku Syed Sirajuddin

Abstract - Feeling Forest – AR Storytelling Card is an innovative educational tool that integrates augmented reality (AR) with card-based storytelling to promote emotional literacy and environmental awareness among children. The innovation bridges traditional tactile learning with immersive digital narratives, allowing learners to explore emotions through forest elements such as sunshine, rain, storms, and trees. Each card is designed with AR markers that, when scanned with a mobile device, reveal interactive characters and soundscapes that symbolise different feelings and natural phenomena. This design not only encourages learners to recognise and articulate emotions but also fosters empathy and ecological responsibility in a playful and engaging way. The scope of the project extends to both formal and informal learning environments, including classrooms, therapy sessions, and home-based learning. A particular emphasis is placed on inclusive education, where the tool is tailored to support children with special needs, such as those with autism spectrum disorder, who often benefit from multimodal and structured learning approaches. Pilot testing with a small group of children demonstrated promising outcomes, with improved engagement, higher levels of emotional recognition, and stronger connections between feelings and environmental contexts compared to traditional storytelling methods. Teachers and parents also observed that children were more motivated to express themselves when interacting with AR-enhanced cards. The innovation is scalable, adaptable across cultural and linguistic contexts, and aligned with the United Nations' Sustainable Development Goals, particularly SDG 4 on Quality Education and SDG 13 on Climate Action. Ultimately, Feeling Forest illustrates the transformative potential of AR storytelling as a bridge between emotional development and environmental education.

Portable Electrical Wiring Testing Kit

Ahmad Muqri Bin Shahman & Ts. Aniza Binti Mohd Ariff

Kolej Vokasional Batu Lanchang

Abstract - The Portable Electrical Wiring Testing Kit was developed to support hands-on learning in the Electrical Maintenance course at vocational colleges. Students often face challenges in understanding wiring systems and troubleshooting techniques due to the lack of training equipment that is portable, safe, and cost-effective. This project aims to produce a compact and lightweight training kit equipped with a fault simulation module, including open circuit, short circuit, and earth leak faults, to enhance students' understanding of diagnostic and maintenance processes.The development process applied the Engineering Design Process (EDP), which includes research, design, prototyping, testing, and continuous improvement phases. The kit comprises essential components such as a terminal block, miniature MCB, main switch, indicator lamp, 24V DC load, and both manual and digitally controlled fault simulation modules. Testing data were collected and analyzed using the 7 QC Tools to ensure the kit's effectiveness and reliability. Findings indicate that the kit significantly improves teaching and learning by promoting hands-on practice, reducing safety risks, and enabling students to better grasp troubleshooting concepts. With its modular design and QR code integration for digital manuals, this kit has strong potential for commercialization as a standard educational tool for TVET institutions and industrial training programs.
Keywords: Portable kit, fault simulation, electrical maintenance, troubleshooting, TVET

Malaysian Crowdsourcing Platform (MCrowdTalent)

Zuria Akmal Saad, Naliza Solat, Azmi Salim, Zaidatulhusna Mohd Isnani & Sri Yusmawati Mohd Yunus

Universiti Teknologi MARA

Abstract - The Ministry of Higher Education's through Graduate Marketability 2021–2025 initiative highlights the importance of preparing Malaysian graduates for the gig and digital economy as part of the nation's journey toward developed status. In response, Universiti Teknologi MARA (UiTM) introduced UBM599 (Digital Workforce), a course designed to equip students with digital freelancing skills and opportunities to earn additional income. However, students face significant barriers when engaging with global crowdsourcing platforms such as Upwork and Fiverr, including limited task access, intense international competition, high service fees, inadequate academic support, and low remuneration. These challenges often discourage new entrants and highlight the absence of a reliable local platform tailored to Malaysia's socio-economic context. To address this gap, we propose MCrowdTalent, a localized online crowdsourcing platform exclusively designed for UiTM students, lecturers, and community. The platform enables structured task posting, fair bidding, and alignment with academic requirements, while also educating the community in widening the use of online crowdsourcing platform. By combining academic engagement, skill development, and community participation, MCrowdTalent aims to expand the adoption of online crowdsourcing practices, prepare students for the digital economy, and strengthen UiTM's role as a driver of innovation and societal impact. Using a mixed-method approach, we conduct a multilayered perspective of the use of crowdsourcing platform. First in 2023, our project first examined digital freelancer' intention and job search behaviour through a survey. Later in 2025 were explored public adoption of crowdsourcing platform and freelancing challenges via qualitative methods. The insights informed the initial development of MCrowdTalent, emphasizing trust, transparency, and inclusivity in digital task outsourcing. By providing a safer, fairer, and academically integrated ecosystem, MCrowdTalent directly supports Malaysia's IR4.0 agenda and strengthens the national digital economy. It positions local digital talents as credible business solutions for Malaysian job providers, thereby creating a sustainable and trusted online labour market tailored to local needs.

FuturaGrow: An AI-Driven Urban Farming Platform Empowering Smarter Crop Care, Sustainability, and Productivity

Kwan Jun Er & Salasiah Sulaiman

Asia Pacific University of Technology and Innovation

Abstract - This research poster explores the development of FuturaGrow, an artificial intelligence (AI)-driven platform designed to transform urban farming practices and strengthen food security. In the face of rapid urbanization, population growth, climate variability, and global disruptions such as conflict and disease, the challenge of producing sufficient and sustainable food has become increasingly complex. These factors have heightened reliance on food imports, destabilized local supply systems, and placed significant pressure on national economies. FuturaGrow responds to these issues by applying advanced AI-powered analytics and decision support to optimize urban farming operations at multiple levels. The platform provides real-time insights into soil health, water usage, pest management, crop growth, and yield forecasting, enabling farmers and communities to make informed, data-driven decisions that improve crop care and resource efficiency. By placing strong emphasis on urban farming environments, FuturaGrow empowers local communities to actively participate in food production within cities, reducing waste, shortening supply chains, and ensuring that food is produced closer to where it is consumed. This approach not only enhances productivity and sustainability but also reduces dependency on imports while reinforcing local food resilience. Ultimately, FuturaGrow illustrates how AI can enable smarter and more sustainable urban farming, support economic stability, and contribute directly to SDG 2 – Zero Hunger, advancing sustainable agriculture and long-term food security.

DellamarXpress: Better and Easier Ways to Enjoy Coffee Today

Aqmar Fahim Hakimi Bin Hazri, Ts. Mazlina Binti Md Mustaffa, Muhammad Zharfan Bin Md Saifuddinizzaini & Amalia Batrisyia Binti Norizan

Politeknik Ungku Omar

Abstract - Digital transformation is reshaping the food and beverage industry, where customer convenience, personalized experiences, and strong brand presence are key drivers of success. This project, Dellamar, directly addresses the digital needs of Dellamar Café by developing an integrated web and mobile platform. Currently, Dellamar Café lacks a centralized digital system to manage online orders, reservations, memberships, and customer engagement. This gap limits efficiency, market competitiveness, and customer loyalty. Our proposed solution is a comprehensive platform combining a public-facing website and mobile app. The website will showcase Dellamar Café's brand, menu, promotions, and events, while the app will enable customers to order online, locate the nearest café, and join the exclusive Dellavors Membership Program for rewards and benefits. An internal dashboard will streamline order management, reservation tracking, and customer communication. Agile methodology will guide development to ensure continuous feedback, user-friendly design, and seamless performance. By analyzing leading café chains in Malaysia such as Starbucks, Zus Coffee, and Secret Recipe, we identified a significant gap in integrated membership and localized ordering features that Dellamar Café can leverage. This project positions Dellamar not only as a café but as a digitally enabled lifestyle brand.

Keywords: Digital Transformation, Café Management, Online Ordering, Membership Program, Agile Methodology

Re:File

Zaim Nuruddin Bin Zulkiflee, Stefanio Issac Yong Ching Xian, Afif Nazmi Bin Nazrul, Muhammad Faris Irfan Bin Mohd Nor Fajar & Norkhairul Azlina Bt Din

Kolej Matrikulasi Perlis

Abstract - The increasing use of plastic-based stationery products in education contributes to environmental pollution and unsustainable practices. Conventional files, often made from petroleum-based plastics, are non-biodegradable and harmful to the ecosystem, persisting for decades in landfills and waterways. Addressing this issue, the innovation "Re: File" reinvents the traditional file by introducing a sustainable alternative made from natural bio-plastics using glycerin and agar as its core ingredients. "Re: File" provides the same functionality as standard files while significantly reducing reliance on non-renewable materials, offering a greener and safer option for everyday academic use. The objectives of this innovation are to promote eco-friendly practices among students, encourage lecturers to adopt greener teaching aids, and support the college's mission of sustainability through practical implementation. "Re: File" benefits students by raising environmental awareness, instilling long-term green habits in their academic journey, and sparking interest in sustainability-driven innovation. For lecturers, it provides a practical and symbolic teaching tool to inspire environmental responsibility and lead by example in class. At the institutional level, "Re: File" strengthens the college's image as a sustainable campus, enhances its role as a leader in Eco-conscious education, and contributes towards reducing its carbon footprint. In the future, "Re: File" can be further developed with different designs, sizes, colors, and durability features, making it a versatile and marketable green product for wider adoption. This innovation not only provides an immediate environmental solution but also encourages a long-term cultural shift towards greener choices in education and beyond.

PredAlert: Automated Detection of Predatory Journals

Dr. Fatimah Bibi Hamzah, Nor Hafiza Abd Samad, Ts. Anis Juanita Mohd Zainudin, Dr. Nor Hafiza Haron & Wan Asiah Wan Tahir

University Poly-Tech Malaysia

Abstract - The emergence of open-access publishing has significantly improved global access to scientific knowledge, offering wider visibility and collaboration opportunities for researchers. However, the rapid growth of this model has also led to the rise of predatory journals that exploit the author-pays system, charging publication fees without providing proper peer review or editorial standards. These unethical practices not only mislead researchers but also undermine the credibility and integrity of scholarly publishing worldwide. To address this challenge, this research introduces an innovative automatic detection system designed to identify and filter out predatory journals. The system applies systematic screening criteria to evaluate journal authenticity, guiding researchers and innovators toward credible outlets indexed in Scopus and WoS. By integrating technology with academic best practices, this solution provides a practical safeguard against exploitation, helping authors avoid financial loss and protecting the value of their scholarly contributions. Beyond individual benefits, the innovation contributes to strengthening institutional reputation, fostering trust in open-access publishing, and supporting the global academic community in maintaining high standards of research dissemination. Ultimately, this project demonstrates a forward-looking approach to ensuring that open access continues to serve as a platform for genuine knowledge sharing, while shielding scholars from the growing risks of predatory publishing.

iZakat: Intergrated Zakat Computation and Payment

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Kolej Yayasan Pelajaran Johor

Abstract - This paper introduces iZakat: Integrated Zakat Computation and Payment System, an innovative platform designed to streamline the calculation and payment of zakat in Malaysia. Within the national legal framework, zakat administration is overseen at the state level by the Majlis Agama Islam Negeri (MAIN), such as the Majlis Agama Islam Johor (MAIJ). Despite the availability of calculators and online channels, gaps remain among the processes of calculation, payment, and verification. Inspired by the Inland Revenue Board's MyTax ecosystem, iZakat centralizes the workflow into a seamless "calculate → pay → verify" cycle, enhancing accuracy, efficiency, and transparency. The system automatically computes zakat across multiple asset categories, including employment income, business profits, savings, and gold or silver, based on nisab, haul, and the 2.5% rate. Additionally, it integrates payment gateways, provides automatic reminders, and stores historical records to strengthen compliance and auditability. An interactive dashboard enables users to track real-time obligations, haul status, and past payments in a user-friendly format. Key advantages include minimizing human error, enhancing transparency, and promoting stronger compliance for both zakat payers and administrators. Beyond improving user experience, iZakat supports the digital transformation of zakat management, encouraging consistent fulfilment of obligations among zakat payers while streamlining operations for MAIN. Overall, iZakat has the potential to serve as a long-term, scalable solution that modernizes zakat administration, ensures compliance with Shariah requirements, and strengthens governance in Malaysia.

Digital Extraction Optimisation Logbook: A Smart Data-Driven Tool for Herbal Research

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Abstract - Herbal extraction experiments frequently produce extensive datasets that are typically documented in handwritten notebooks, which can result in inconsistencies, calculation errors, and limited opportunities for optimisation. These issues are especially common among undergraduate students, who require reproducibility and precision in their research training. To address these concerns, the Digital Extraction Optimisation Logbook was created as an economical, Excel-based tool that converts manual record-keeping into a dynamic and automated system. The platform offers structured data entry with dropdown menus for experimental parameters, automatic calculations of extraction yield (%) and total flavonoid content (TFC, mg QEE/g), and integrated dashboards for visualisation. Using Acalypha indica Linn. as a model plant, the logbook was evaluated with extracts prepared using ethyl acetate, methanol, and n-hexane across various solvent-to-material ratios. The TFC Dashboard automatically generated comparative charts for solvent, ratio, temperature, time, and ultrasonic power. The results demonstrated significant enhancements in accuracy, reproducibility, and presentation quality when compared to traditional notebooks. This innovation bridges laboratory practice with digital technology, enabling students to adopt systematic, analytical, and sustainable approaches to herbal extraction research.

Integrated Record & Information Management System

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Politeknik Mersing Johor

Abstract - The management of prisoner and citizen records currently faces significant challenges due to its reliance on manual processes such as paper-based files, Excel spreadsheets, and unsecured sharing platforms like Google Drive. These outdated methods not only consume time and resources but also lead to data inconsistency, duplication, limited accessibility, and delays in verification and decision-making across multiple agencies. To overcome these issues, this project proposes the development of the Integrated Record & Information Management System (IRIMS), a centralized digital platform designed to streamline and modernize record management both locally and internationally. IRIMS incorporates several core features including global monitoring of citizens abroad and foreign nationals within the country, secure role-based access control to ensure proper authorization and data protection, and a verification module that facilitates faster and more reliable collaboration between embassies and government departments. Furthermore, the system introduces real-time data synchronization to eliminate manual updates, alongside a smart analytics dashboard that generates accurate reports, real-time statistics, and actionable insights. By replacing manual and fragmented processes with an integrated digital system, IRIMS ensures that record management becomes more accurate, efficient, and secure, while also strengthening inter-agency collaboration and enabling embassies worldwide to access the most up-to-date information instantly. Ultimately, this solution enhances transparency, speeds up decision-making, and establishes a scalable platform capable of addressing the growing demands of international record and information management.

An AI-Powered Application for Diagnosing Heart Abnormalities

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The Demonstration School of Nakhon Pathom Rajabhat University

Abstract - Heart disease remains one of the leading causes of mortality worldwide, with early detection posing significant challenges in resource-limited and rural areas. Heart murmurs, which signal potential cardiovascular abnormalities such as valve regurgitation, stenosis, or septal defects, are often overlooked due to the shortage of trained healthcare professionals and the limited accessibility of advanced diagnostic tools like echocardiography. To address these disparities, this project introduces SmartBeat, an AI-powered smartphone application designed for heart murmur detection and preliminary diagnosis support. The system allows users to record heart sounds using a built-in smartphone microphone, which are then preprocessed using techniques such as Mel-Frequency Cepstral Coefficients (MFCC) and spectrogram analysis. A hybrid deep learning model combining Convolutional Neural Networks (CNN) and Bidirectional Long Short-Term Memory (BiLSTM) networks, developed on TensorFlow and optimized with Active and Multimodal Learning strategies, analyzes the signals to determine the presence of abnormal heart sounds. The application, developed with Android studio for cross-platform accessibility, presents results in user-friendly formats including text alerts, waveform graphs, and record-keeping options. Initial testing demonstrated an accuracy of 82.5% in distinguishing pathological murmurs from normal sounds, validating the potential of the prototype as an affordable and accessible screening tool. By reducing reliance on costly equipment and specialized expertise, SmartBeat has the capacity to alleviate healthcare inequalities, promote early intervention, and serve as a supportive diagnostic assistant in both community and clinical settings. Future development aims to expand datasets, refine model robustness, and integrate the system with telemedicine platforms to enhance long-term preventive healthcare and sustainable public health outcomes.

MangoSwiss Cookies

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Kolej Vokasional Kuala Selangor

Abstract - MangoSwiss Cookies are a modern cookie innovation inspired by the classic Swiss Tart, but reinvented with the use of natural ingredients such as mango skin. Despite the name “Swiss,” these cookies do not actually originate from Switzerland; instead, they are popular in Malaysia and Singapore, especially during festive seasons. With their crumbly texture and a variety of fillings such as fruit jam, chocolate, and caramel, these cookies have become a premium choice in the pastry world. Research shows that mango skin, which is often discarded, is actually rich in fiber, antioxidants, and bioactive compounds that provide benefits in health, beauty, and agriculture. In the food industry, mango skin is utilized as a source of fiber, a natural flavoring, and an eco-friendly organic preservative. The production of MangoSwiss Cookies using mango skin not only reduces food waste but also meets consumer demand for healthy and nutritious food. Overall, this product holds great potential in supporting sustainability practices and emerging as a new choice in the modern food market.

IEWRA Application: Advancing Worker Safety through Innovative Indoor Environmental Risk Assessment in SMEs

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Abstract - Indoor environmental conditions play a critical role in shaping worker health, safety, and productivity, particularly in Small and Medium Enterprises (SMEs) where safety management resources are often constrained. Hazards such as poor air quality, fluctuating temperatures, excessive noise, and exposure to chemical or biological contaminants can compromise worker wellbeing and reduce operational efficiency. Addressing these risks requires innovative yet practical solutions tailored to the needs of SMEs. The Indoor Environmental Workplace Risk Assessment (IEWRA) Application is developed as a digital tool to advance worker safety through effective risk identification and management. IEWRA provides a structured, user-friendly platform that enables SMEs to assess, monitor, and mitigate indoor environmental hazards without requiring extensive technical expertise or costly equipment. Users can input workplace data on air quality, temperature, humidity, noise, and contaminants, which are then analysed using built-in algorithms. The system delivers comprehensive risk evaluations alongside clear, actionable recommendations to guide preventive and corrective measures. In addition to real-time assessments, the application supports data logging and generates detailed reports that facilitate regulatory compliance, informed decision-making, and continuous improvement of workplace conditions. Its emphasis on accessibility and affordability makes it particularly suitable for SMEs seeking to strengthen occupational safety practices with limited resources. By equipping employers and workers with reliable risk assessment capabilities, the IEWRA Application not only enhances workplace safety but also nurtures a proactive culture of health and resilience. Ultimately, this innovation contributes to safer, healthier, and more sustainable working environments within the SME sector.

PillScan AI: Intelligent Pill Recognition and Elderly Medication Management

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Sisaketwittayalai School

Abstract - Medication mismanagement among elderly populations has become an increasingly critical healthcare challenge, particularly in developing countries such as Thailand where polypharmacy prevalence is high. Older adults commonly face difficulties in distinguishing their prescribed medications due to poor eyesight, cognitive decline, and a lack of systematic medication organization. A prevalent issue involves mixing different pills into a single container, which often leads to incorrect dosage, adverse drug reactions (ADRs), and even emergency hospitalizations. This study proposes the development of an AI-powered pill identification and medication management system designed to assist elderly patients and their caregivers. The mobile-based application utilizes computer vision and optical character recognition (OCR) to analyze pill characteristics—including color, shape, size, and imprinted markings—and cross-references them with an integrated pharmaceutical database from trusted sources such as the Thai Food and Drug Administration (Thai FDA) and hospital formularies. The system further incorporates personalized medication schedules, real-time pill verification, and drug interaction alerts to enhance medication safety. By combining machine learning algorithms with a user-friendly interface optimized for elderly users, the proposed solution aims to reduce medication errors and improve adherence to prescribed treatments. Preliminary evaluations suggest that AI-driven pill recognition can achieve accuracy rates above 90% when integrated with high-quality pharmaceutical datasets. Furthermore, the system offers potential integration with hospital electronic medical records (EMRs), enabling pharmacists and healthcare providers to remotely monitor patient medication compliance. The proposed framework represents a significant step toward addressing medication mismanagement among older adults, with implications for reducing ADR-related hospital admissions and improving overall healthcare outcomes. Future work will focus on large-scale clinical validation and expanding the system to support multi-language interfaces and predictive analytics for personalized healthcare.

Keywords: Pill identification, AI-based healthcare, medication adherence, elderly patients, polypharmacy, OCR, computer vision

2-in-1 Robotic System for Patient Screening and Treatment Monitoring in Healthcare Facilities

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Triam Udom Suksa School of the Northeast

Abstract - In the era of rapidly advancing Artificial Intelligence (AI), healthcare systems worldwide face critical challenges, including an increasing patient load, limited medical personnel, and delays in treatment that impact patient outcomes. To address these pressing issues, our team introduces the "2-in-1 Robotic System for Patient Screening and Treatment Monitoring in Healthcare Facilities", an innovative robotic platform that integrates real-time patient screening and treatment monitoring into a single comprehensive system. Unlike conventional healthcare solutions that focus on specific diseases, this system unifies autonomous navigation with LiDAR and SLAM, precise patient detection through YOLOv11 and depth cameras, and natural voice interaction using Whisper and Coqui TTS, enabling seamless follow-up and patient engagement. All health data are securely transmitted to Firebase and Google Cloud, while instant LINE notifications allow patients to receive updates without unnecessary hospital visits, reducing delays and operational burden. The system supports multilingual functionality, IoT integration, and can be expanded toward predictive analytics, telemedicine, and blockchain-secured health data management, providing scalability for future digital healthcare applications. By alleviating medical staff workload, improving diagnostic accuracy, and enhancing patient care quality, this 2-in-1 robotic system establishes a new standard for intelligent healthcare innovation. Its uniqueness lies in the holistic integration of multiple medical and technological functions into one unified platform, combining precision, efficiency, and accessibility in a way no existing solution has achieved. This innovation not only addresses current healthcare challenges but also lays the foundation for a global paradigm shift in patient-centered, AI-enabled medical care.

Pensera

Sangin Anak Juat, Muhamad Afif Danial, Albert Lau Shu Cai & Rafiqi Dzakwan Bin Rhyme Dzulkarnaen

Institute of Teacher Education Rajang Campus

Abstract - The rapid growth of Artificial Intelligence (AI) has created new possibilities in education, especially in supporting academic writing. However, many existing AI tools are general in nature and do not meet the specific needs of teacher trainees at the Institute of Teacher Education (IPG). New students often struggle to organize their essays and apply correct academic conventions, while senior students face the greater challenge of producing theses that require strong organization, critical analysis, and academic integrity. To address these issues, this project introduces PENSERA, a custom AI dashboard developed for academic writing at IPG. PENSERA is designed to reflect the academic culture of IPG and provides key features such as grammar and paraphrasing support, citation and reference management, and data-to-text conversion. Its most unique feature is the lecturer's supervision panel, which allows real-time monitoring of student progress and enables lecturers to give personalized feedback that directly improves learning outcomes. By tailoring AI functions to the specific needs of teacher trainees, PENSERA helps beginners build confidence in essay writing and supports senior students in producing structured, credible, and high-quality theses. Ultimately, this innovation positions AI not as a shortcut, but as a supportive learning partner that enhances academic writing skills, strengthens integrity, and prepares IPG students for the expectations of higher education and professional scholarship.

ENGINUITY: Smart Solutions for Modern Engineering Consultancy

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Politeknik Ungku Omar

Abstract - Digital transformation is a vital enabler of growth, efficiency, and competitiveness in the modern engineering sector. This project, Enginuity, addresses the digital needs of HNZ Consult Sdn. Bhd., a leading Malaysian engineering consultancy, by developing an integrated web and mobile application. At present, the company lacks a centralized digital platform, limiting its market visibility, hindering recruitment efficiency, and constraining real-time client communication. These gaps present significant challenges to operational performance and long-term sustainability. The proposed solution is a comprehensive platform with multiple functions. The public-facing website will highlight the company's profile, services, portfolio, and certifications, thereby strengthening its corporate branding. A secure, password-protected Client Portal will enable real-time access to project updates, documents, and reports, improving transparency and client engagement. Additionally, the platform will feature an online recruitment system to centralize resume submissions and streamline candidate evaluations. Development will be guided by Agile methodology, ensuring iterative progress, continuous feedback, and refinement. The system will prioritize usability, functionality, and rigorous performance testing to deliver a reliable solution. Comparative analysis of leading Malaysian construction and consultancy firms reveals a significant gap in client-focused digital tools and mobile integration—an opportunity this project is designed to capitalize on. Ultimately, Enginuity represents more than a technological enhancement; it is a strategic investment that elevates HNZ Consult's corporate image, strengthens client relationships, and drives operational efficiency. The project also provides a real-world case study in digital transformation, showcasing the application of full-stack development and mobile integration in the engineering consultancy sector.

Splashsuit Swimwear

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Asasi Sains Universiti Putra Malaysia

Abstract - Drowning is the second leading cause of death among children aged 0–14 years in Malaysia, with an average of 10 cases reported each month. Studies show that 83% of drowning victims in boat-related incidents were not wearing life jackets, highlighting the urgent need for preventive measures. This project introduces SPLASHSUIT SWIMWEAR, an innovative safety garment designed to reduce drowning risks, particularly for children. The suit integrates three key safety features: (i) a whistle placed under the neckline, enabling children to attract attention during emergencies; (ii) an airbag that functions as a life buoy to keep the child afloat; and (iii) a panic alarm button that automatically activates when the child's head is submerged, sending an alert to guardians or authorities. These features collectively ensure that children have multiple layers of protection while swimming. The main objectives are to enhance water safety, reduce drowning cases, and provide peace of mind for parents and caregivers. Importantly, the innovation aligns with United Nations Sustainable Development Goal (SDG) 3: Good Health and Well-Being, specifically the target of reducing preventable deaths under five years of age. SPLASHSUIT SWIMWEAR represents a proactive approach to child safety, combining technology and practicality for life-saving impact.

HERITAGEBITE: An Interactive Approach to Creative Marketing of Kedah Malay Traditional Kuih

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Abstract - Kedah Malay traditional kuih embodies significant cultural and aesthetic values within the Malay community's heritage. Although contemporary acceptance has been challenged by the rise of modern and viral food trends, traditional kuih continues to warrant high recognition and preservation. Findings from semi-structured interviews with members of Generation Z indicate that their awareness of heritage foods is predominantly shaped through social media platforms. Nevertheless, viral foods attract greater attention due to distinctive marketing strategies, particularly the use of taglines associated with the "Fear of Missing Out" (FOMO) phenomenon, which contributes to their popularity. In response to this challenge, the present innovation introduces Heritagebite, an interactive marketing framework designed to promote Kedah Malay traditional kuih in a creative and engaging manner. The primary objective of this initiative is to support traditional kuih producers and entrepreneurs in adopting interactive marketing practices that can enhance visibility and generate sustainable income. Employing marketing strategies aligned with contemporary developments ensures that traditional kuih remains relevant and safeguarded against cultural erosion. Heritagebite functions both as a tagline and as an interactive marketing approach, incorporating three key components: firstly; QR code scanning to provide comprehensive information on Kedah Malay traditional kuih through video demonstrations of the preparation process, secondly; infographic postcards highlighting cultural and culinary insights, and thirdly; geographical mapping of Kedah Malay traditional kuih locations. This innovation, under the motto Taste of Tradition, Contemporary Style, aspires to preserve the cultural significance and authenticity of Kedah Malay traditional kuih while simultaneously elevating the status of Malaysia's gastronomic heritage. It is envisioned that this approach will facilitate the sustainable transmission of traditional food knowledge and practices across generations, in line with evolving societal trends.

Keywords: Traditional kuih, Kedah Malay heritage, Heritagebite, creative marketing, gastronomic preservation

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Solar Turbine Power Supply

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Kolej Vokasional Batu Lanchang

Abstract - The global push for residential renewable energy predominantly favors standalone photovoltaic (PV) systems, yet their effectiveness is hampered by inherent intermittency and a fundamental misalignment with typical household consumption patterns, where demand peaks in the morning and evening. This research confronts this limitation by addressing a secondary, often overlooked, inefficiency: the complete loss of kinetic energy within domestic water distribution systems. This paper presents the design and conceptual framework for a novel hybrid energy harvesting system that synergistically integrates a standard solar PV array with an in-pipe micro-hydro turbine, aiming to create a more consistent and reliable residential power source. The proposed system architecture is centered around a smart charge controller that intelligently manages power from both the solar panels and the water turbine. These dual generation sources feed into the controller, which optimizes the charging of a central battery bank. This stored energy is then inverted and supplied to the household, ensuring a stable power supply irrespective of weather conditions or time of day. The core methodology involves harnessing solar energy during peak daylight hours while simultaneously capturing energy from water flow, a source that is most active during morning and evening routines. This dual-source approach transforms a home's standard plumbing into a valuable power generation asset. The primary novelty of this research lies in this complementary energy harvesting strategy, which smooths out the power generation curve throughout a 24-hour cycle. The proposed hybrid system is expected to significantly enhance household energy self-sufficiency, reduce reliance on the conventional electrical grid, and provide a buffer against power outages. By creating a more resilient and efficient micro-generation model, this solution not only lowers the user's carbon footprint but also presents a practical and scalable approach for sustainable residential power in diverse environmental and grid conditions.

WiFi Education Kit for SmartHome

Muhammad Afiq Hakim Bin Mohd Hishap, Syed Alif Azhar Bin Syed Zikril Yuszaini, Muhammad Hezrie Riezman Bin Muhammad Mofetz & Mohammad Lutfi Bin Mohamad Zin

Kolej Vokasional Batu Lanchang

Abstract - In today's fast-evolving technological landscape, teaching aids (TA) are essential in enhancing the quality and effectiveness of the teaching and learning process (T&L). For technical courses such as EEA 4012 Green Technology and DEA 3323 Control Systems, the integration of practical learning tools is crucial in bridging the gap between theory and real-world application. The project entitled WiFi Education Kit for Smart Home was developed to provide students with hands-on experience in understanding the fundamental concepts of smart home technology. This educational kit offers an innovative platform where students can practically engage in operating and controlling smart devices such as lights, fans, and doors through WiFi-based systems. The kit is built around the ESP32 microcontroller, which is programmed using Arduino IDE. It integrates control functions via mobile applications such as Blynk IoT or Telegram, allowing students to explore modern methods of device communication and automation. The hardware configuration includes 8 relay modules, 6 AC relays, 2 contactors, and 8 switches, enabling it to manage electrical appliances with higher current loads. This setup ensures that the kit reflects realistic applications of smart home technology, making the learning experience both relevant and industry oriented. The project follows a systematic development methodology consisting of analysis, design, development, testing, and maintenance phases. This structured approach guarantees both the reliability and the pedagogical value of the kit. Beyond meeting academic requirements, the WiFi Education Kit for Smart Home provides students with an engaging, interactive, and impactful learning experience. It not only fosters better understanding of smart home concepts but also cultivates problem-solving, technical, and innovation skills that are essential for future engineers and technologists.

The PiezoPatches

Yuvan Saktivel A/L Pubalan, Lim Zen Hao, Narresh Sukumaran, Dheepak Kumar A/L Sivakumar & Shakirah Binti Md Sanusi

Kolej Matrikulasi Perlis

Abstract - This Piezoelectric Patch focuses on environmental sustainability, affordability, and user convenience. One of the key problems was ensuring that the invention remains environmentally friendly. To achieve this, this device use mechanical stress and minimal electricity to power it’s functions, eliminating the need for non renewable energy sources such as fossil fuel. This invention is designed to be cost-friendly by sourcing materials and components from local vendors without compromising quality while supporting local businesses. The objectives of this innovation includes creating a lightweight and practical alternative to heavy power banks, improving the comfort and conveniences of physical activities and promoting the use of piezoelectric technology. The technology itself is underutilized in consumer products, making the invention unique in its approach. It prioritizes practicality and ease of use while maintaining a high degree of customization for users. The impact of this innovation is to provide individuals with a convenient, eco-friendly solution for powering their devices during physical activities, and it encourages broader community engagement through its accessibility and sustainability. Additionally, the product’s potential to reduce environmental harm aligns with growing global concerns about sustainability. In terms of commercial potential, the product offers a cheaper and lighter alternative to traditional power banks, particularly suited for users engaged in outdoor activities, sports, or fitness routines. Customers are mainly paying for the convenience and practicality the invention offers, positioning it as a highly attractive option in the marketplace. By combining sustainability with functionality, this innovation is well-positioned for widespread adoption.

HI-AID

Nur Mazida Binti Mazlan, Siti Zatusy Elyana Binti Mat Rashid, Atikah Binti Mohd Jajuli, Amni Binti Mohamad Iskandar, Nadia Binti Mohd Zamri & Wafa Nasuha Binti Mohd Fadzil

SK Jeram Batu 20

Abstract - The Hi-AID innovation is a health and education initiative aimed specifically at primary school girls who are experiencing their first menstrual period. This innovation takes the form of a one-of-a-kind, practical, and user-friendly pouch bag designed to provide educational, emotional, and menstrual management support while also supplying basic necessities. The Hi-AID pouch is made from fabric remnants, which aligns with the 3R principles (Reduce, Reuse, and Recycle) of sustainable environmental practices. Its compact size and discreet design allow it to be easily stored in a schoolbag, providing students with comfort and a sense of security. Each pouch includes essentials like sanitary pads, clean pants, tissues, a small plastic bag and a simple, easy-to-follow guide. Hi-AID not only meets physical needs, but it also provides early exposure to reproductive health education through illustrated, child-friendly notes. This approach is critical in reducing students' fear, confusion, and stigma when they experience menstruation for the first time. The project directly contributes to several Sustainable Development Goals (SDGs), including SDG 3: Good Health and Well-Being, SDG 4: Quality Education, and SDG 12: Responsible Consumption and Production. Hi-AID has had a positive impact on school communities by raising awareness among teachers, students, and parents about proper menstrual management. Furthermore, it encourages young girls to accept bodily changes with dignity and confidence, while acting as an effective educational tool and catalyst for raising menstrual awareness in school communities.

ACCURA- KVKS Pioneering Smart Accounting Tools

Aizatul Asyikin Bt Tajul Ariffin, Firdhaus Al-husaini Bin Md Zahari, Nur Farahnezzan Bt Mohd Nasir, Nur Damia Insyirah Bt Mohd Asra & Ungku Danisharf Danial Bin Ungku Ridzwan

Kolej Vokasional Kuala Selangor

Abstract - This study investigates the enhancement of accounting record-keeping systems in small businesses through the adoption of fully digital solutions. Many small enterprises often face challenges in maintaining accurate and organized records, which negatively affect financial reporting, regulatory compliance, and cash flow management. To address these issues, a structured accounting framework was developed using Microsoft Excel, comprising essential components such as sales and purchase books, cash books, asset registers, depreciation schedules, general journals, general ledgers and trial balances. Furthermore, financial statement, including the Statement of Profit or Loss and the Statement of Financial Position, were generated to provide clearer insights into business performance and financial standing. A digital filing system was also established to manage source documents such as invoices, receipts, bank statements, payroll records and asset information. By adopting a fully digital storage approach, businesses benefited from improved accessibility, reduced risk of document loss and more efficient monitoring of financial transactions. The methodology employed involved observation, interviews and document analysis, which revealed weaknesses in existing practices and evaluated the effectiveness of the proposed system. Findings indicated that systematic digital record-keeping reduces errors, enhances financial transparency and support better decision-making. Ultimately, the study demonstrates that embracing digital accounting systems can strengthen financial management and contribute to the long-term sustainability of small businesses.

Hanyu Pinyin Learning Application

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Kolej Vokasional Kuala Selangor

Abstract - This study explores the effectiveness of a Hanyu Pinyin learning application in enhancing the understanding of initial phonemes among Year 2 Diploma Vokasional Malaysia students at Kolej Vokasional Kuala Selangor. Hanyu Pinyin, as the standardized Romanization system for Mandarin, is fundamental in ensuring accurate pronunciation and reading fluency. However, many students struggle to distinguish and articulate initial phonemes due to phonological differences between their native language and Mandarin. To address this issue, the study introduced a digital learning application as a supplementary tool to classroom-based instruction. A survey method was employed, involving 60 students enrolled in the Mandarin elective course. Data were collected through pre-tests and post-tests conducted before and after the use of the application. The results showed that the application significantly improved students' comprehension, with most participants demonstrating progress in recognizing and pronouncing initial phonemes. Contributing factors included the interactive and user-friendly design of the application, clear pronunciation models, engaging visuals, and features that encouraged active learner participation. These elements not only supported understanding but also enhanced students' motivation and confidence in using Mandarin. The findings suggest that the Hanyu Pinyin learning application can serve as an effective teaching aid, particularly when integrated with guided practice and interactive activities. Furthermore, the study contributes to the advancement of digital pedagogy by demonstrating the potential of mobile-based technologies in language learning. It highlights the importance of incorporating innovative tools to support personalized, flexible, and engaging learning experiences, especially in vocational education contexts.

Keywords: Learning application, Hanyu Pinyin, initial phonemes, Mandarin language teaching, educational technology

741 Hz: Micro Speaker on Class Desk

Nur'arifatulhuda Binti Shahrulnizam, Nik Nur Madhiah Binti Mohd Asri, Umairah Dharmira Binti Nordin, Durratul Hikmah Binti Pozilan & Syuriahni Binti Omar

Kolej Matrikulasi Perlis

Abstract - Solfeggio frequencies refer to precise tones that consist of six basic electromagnetic tones extended to nine tones. The fundamentals of solfeggio frequencies suggest that the specific vibrational patterns of sounds within the 174 Hz to 963 Hz range have the potential to promote positive physical, mental, and spiritual outcomes. Students in class, especially from primary school, generally have a shorter attention span, ranging from 10 to 30 minutes of continuous instruction. This problem could affect their learning ability by making it harder to absorb information and stay engaged in lessons with full focus. The main goal for this project is to help students regain their focus by using low-volume 741 Hz Solfeggio Frequency in class. The sound emitter is positioned in a specific spot in a classroom to ensure that the radio waves can reach every student optimally. The low-volume frequency will be emitted for one minute at intervals of 15 or 30 minutes, depending on current conditions of the classroom. The sound level will be set in the range of 20 to 30 dB to ensure optimal audibility without being too faint or too loud for students. 741 Hz specifically could help with intellectual work and problem-solving skills by stimulating the mind and encouraging creativity, making it ideal for studying and academic work. It can help keep distracting thoughts away, allowing students to concentrate better in class. In short, this project helps students regain their focus and improve their learning ability.

NutriFit

Sam Yu Nee, Sam Yu Fei, Wong Tze San, Soon Jia Jing & Adrilayanti Binti Alauddin

Kolej Matrikulasi Perlis

Abstract - Obesity and malnutrition have become pressing global health concerns. According to the NCD-RisC 2024 report, over one billion individuals— including 880 million adults and 159 million children and adolescents—are living with obesity. At the same time, millions suffer from nutrient deficiencies due to limited awareness and the lack of personalized dietary guidance. To address this growing challenge, The Vital Visionaries propose NutriFit, an innovative application that provides fully customized health plans by integrating both diet and exercise guidance tailored to each individual. Users manually input their meals, including nutrient information such as protein, carbohydrates, and fiber, along with personal details such as height, weight, age, and gender. The app then calculates daily calorie requirements, clearly displayed on the user's profile page. Based on this information, NutriFit generates personalized meal plans, highlights nutrient deficiencies, suggests healthier alternatives, and provides exercise recommendations aligned with the user's calorie intake, including both the type and duration of workouts. Designed with accessibility and ease of use in mind, NutriFit encourages consistency through achievement tracking, progress summaries, and motivational feedback. By combining nutrient analysis, meal planning, and exercise guidance in a single platform, NutriFit empowers individuals of all ages to take control of their health, develop sustainable wellness routines, and make informed decisions about diet and activity. Ultimately, the app supports users in combating obesity, preventing lifestyle-related diseases, and building long-term healthy habits for a stronger, healthier future.

Sissagummy: Gummy from Watermelon Rind

Norfarahin Binti Ab Rahim, Nadine Nasreen Binti Yussainy & Inas Shakirah Binti Ridhuan

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Abstract - This innovation project aims to produce a gummy product made from watermelon rind, functioning as a nutritious snack while simultaneously addressing the growing issue of food waste in the food industry. Watermelon rind, which is often considered waste and discarded, has been selected as the main ingredient due to its richness in vitamins, minerals, and dietary fiber that are beneficial to human health. However, its continuous disposal contributes to environmental pollution and represents a loss of valuable natural resources. In response to this issue, the project introduces a creative and sustainable solution by transforming watermelon rind into a tasty, healthy, and appealing gummy snack that offers both nutritional benefits and environmental value. The research methodology began with gathering information on the nutritional potential and possible applications of watermelon rind in food products. A standard gummy recipe was selected and modified using natural ingredients, such as organic brown sugar, to improve the taste, texture, and overall nutritional quality of the final product. Once developed, the gummy was subjected to product testing involving respondents who evaluated it based on several key criteria: taste, appearance, colour, texture, and acceptability. The findings showed that the watermelon rind gummy was well-received by the majority of participants. Most respondents expressed satisfaction with its pleasant taste and chewy texture, noting its potential as a healthier alternative to conventional gummy snacks. In addition, the product demonstrated commercial viability, especially among health-conscious consumers and those interested in eco-friendly food products. In conclusion, this project successfully demonstrates that food waste, particularly watermelon rind, can be upcycled into a value-added, nutritious product. This innovation not only offers a sustainable snacking option, but also contributes to broader efforts in waste reduction and environmental conservation. It is hoped that this project will inspire more initiatives that turn food waste into practical, marketable products.

A.K.I.R.A

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Abstract - Education in the 21st century requires innovative solutions to address passive learning, overdependence on gadgets, low motivation, and mental health issues that hinder effective teaching and learning. Many students lack resilience, critical communication skills, and meaningful engagement in learning, while existing digital platforms often focus only on content delivery without supporting emotional well-being or adaptive learning needs. To overcome these challenges, the project A.K.I.R.A. (Adaptive Knowledge Innovation Resilience Aspire) was designed with three main objectives: (i) to enhance personalized learning through AI- powered performance analytics, (ii) to integrate gamification that motivates and sustains student engagement, and (iii) to support emotional and psychological well-being alongside academic development. The innovation consists of six modules, namely the Digital Academic Hub, Real-Time Business Simulation, Well-Being & Motivation, AI-Powered Learning Support, Gamification & Rewards, and Additional Features, offering a comprehensive ecosystem that merges digital academic content, AI-driven performance monitoring, gamified challenges, and psychosocial support. The novelty of AKIRA lies in its integration of academic, technological, and emotional dimensions into a single platform, creating inclusive and data- driven learning aligned with SDG 4 (Quality Education). The benefits extend to students, who can identify weaknesses, improve through adaptive quizzes, and remain motivated with reward systems; lecturers and counselors, who gain automated reports for targeted interventions; and institutions, which can implement scalable, modern pedagogy. In conclusion, A.K.I.R.A is not merely a learning tool but a holistic and future-ready educational ecosystem that fosters future leader skills such as critical thinking, creativity, communication, and collaboration.
Keywords: Artificial intelligence, Gamification, Digital learning, SDG 4, Future leader skills

Web of Chaos

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Abstract - The Web of Chaos project offers an innovative online platform for time series prediction using Chaos Theory, designed to be both accessible and affordable. It removes the barriers of expensive software and complex installations by providing a straightforward web interface. Users can easily upload their data, perform analyses, and download outputs like time series graphs, prediction graphs, and correlation coefficient values. This platform is particularly beneficial for researchers and the public who may not have access to costly analytical tools. By democratizing these advanced capabilities, Web of Chaos encourages more people to engage with Chaos Theory across various fields, including atmospheric science, medical research, hydrology, and finance. The project also holds significant commercial potential by filling a crucial gap in the market for affordable data analysis tools. Its user-friendly design and broad applicability make it attractive to both academic researchers and industry professionals. By promoting chaos research, especially in Malaysia, Web of Chaos aims to build a strong community of researchers, fostering interdisciplinary collaboration and advancing knowledge in this field. This versatility ensures its viability and success in the market.

Enhancing Algebra Education Through Interactive and Innovative Tools: The Algebra Toolkit

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Abstract - Time series The Algebra Toolkit was developed as a response to the challenges many vocational college students face in understanding algebra, particularly in topics such as linear and quadratic equations. Algebra is often perceived as abstract and difficult, leading to reduced motivation, limited problem-solving ability, and weaker academic performance. To address this issue, four interactive and innovative teaching aids were designed and tested: Quadzlee, a puzzle card game for quadratic equations; Kad Terup Kuadratik, a playing card activity for equation practice; the Algebra Magnetic Board, which allows students to physically manipulate numbers and variables; and the Linear Game Board, which introduces equation solving through play-based learning. The use of these tools transforms algebra learning from a passive experience into an engaging, hands-on process. Students are encouraged to work collaboratively, think critically, and apply concepts in a more meaningful way. The tangible nature of the toolkit caters to different learning styles, especially for kinesthetic learners who benefit from physical interaction. The research involving 50 Semester 1 students revealed notable improvements in test performance, reduced errors, and greater confidence in attempting mathematics problems. Students also reported higher levels of motivation and enjoyment compared to traditional teaching methods. Beyond the classroom, the Algebra Toolkit shows strong potential for wider application in schools, tuition centers, and other educational settings. Its durability and reusability make it cost-effective, while its design ensures accessibility for diverse learners. Ultimately, the toolkit highlights how innovative, game-based approaches can make algebra more approachable, enjoyable, and effective for students.

The Value-Centric Approach to Smart Farming in Malaysia's Paddy Sector: Uncovering Drivers and Barriers

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Abstract - The paddy sector is essential for Malaysia's food security, but it faces ongoing issues such as low productivity, climate variability, and sustainability challenges. While the government actively promotes Smart Farming Technologies (SFTs) as a means to address these issues and modernize the sector, their adoption among paddy farmers remains slow, constrained by structural and behavioral barriers. This study adopts a Value-Centric approach for Smart Agriculture Transformation, emphasizing that farmers' sense of value and their readiness to use technology together influence their adoption decisions. This study aims to examine the determinants and barriers influencing farmers' overall perceived value toward smart farming adoption within a value-centric approach. Data was collected using multiple face-to-face strategies from 351 paddy farmers in Northern and Northeastern Peninsular Malaysia, which is crucial for national rice cultivation. Data were further analysed using PLS-SEM. The findings revealed that perceived efficiency, enabling conditions, and financial investment influence overall perceived values of smart farming adoption. Unexpectedly, farmers perceived SFTs costs positively, while concerns about complexity and uncertainty were negligible, suggesting that familiarity with technologies and trust in SFTs outsourced services can offset traditional barriers. Technology readiness categorizes farmers into two groups: enthusiastic adopters who actively embrace sustainable farming technologies (SFTs), and hesitant farmers who need stronger demonstrations of value. Policymakers should prioritize redesigning support systems to enhance value creation. This can be achieved by linking subsidies to aid farmers in training, improving performance, and adopting sustainable farming technologies, while also investing in smart technology infrastructure. Equally important is empowering extension officers as knowledge brokers, scaling affordable "SFT-as-a-Service" models, and offering micro-financing schemes to foster SFTs adoption among farmers. By accelerating SFTs adoption, Malaysia can strengthen national food security (SDG 2), enhance rural livelihoods (SDG 8), and foster resilient agricultural infrastructure (SDG 9), paving the way for a modern and sustainable paddy industry.

Zigzag Shooting for Event, Exhibition & Gallery Preservation

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Abstract - Events, exhibitions, and galleries are essential venues for safeguarding cultural heritage and fostering artistic expression. Nonetheless, their ephemeral and fluid characteristics pose considerable obstacles for enduring preservation. Traditional documentation techniques, such photography and linear video capture, often prioritize specific artworks or performances, overlooking space configurations, curatorial objectives, and audience engagement. This disjointed methodology frequently leads to archives that do not fully encompass the depth of cultural experiences. This study proposes zigzag shooting as a novel visual documenting method for the preservation of events and galleries to overcome existing restrictions. The study utilized a qualitative methodology, documenting events and exhibitions through systematic zigzag camera motions to encompass both primary subjects and their surrounding environments. The visual resources were subsequently assessed to assess three critical aspects: spatial coverage completeness, visitor engagement depiction, and atmospheric preservation. Expert evaluations from curators and visual researchers were solicited to confirm the method's efficacy. Research demonstrates that zigzag shooting provides a more comprehensive and engaging means of documenting than traditional techniques. This technique enhances cultural archives by documenting both the artworks and the surrounding environment, as well as audience engagement. Moreover, zigzag documentation facilitates prospective applications in digital heritage, encompassing 3D reconstruction, virtual displays, and instructional materials. This study underscores the promise of zigzag shooting as a novel approach to preserving the richness of events and museum experiences for future generations.

Smart Reverse Vending Machine

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Abstract - This project aims to develop an automated Reverse Vending Machine (RVM) using Arduino-based control. The machine can be installed in various public places such as schools, shopping malls, offices, and community areas to promote recycling practices. The main focus of this machine is to detect, sort, and reward users who insert recyclable materials such as plastic bottles and aluminum cans. This machine is expected to raise public awareness about the importance of recycling while providing cash rewards or incentives to users. In addition, the system helps reduce pollution, saves manual labor in the sorting process, and ensures that recyclable materials are collected more efficiently. The RVM is designed as a smart and user-friendly device capable of solving problems such as littering, lack of motivation to recycle, and the difficulty of manual waste separation. To overcome these challenges, the RVM is developed with several objectives that ensure the system is easy to use, automated, and capable of operating for extended periods. This project offers several advantages compared to manual methods, including higher efficiency, time savings, reduced waste management costs, and user motivation through the reward system. The inspiration for this project comes from existing automated machines such as vending machines, smart sorting systems, and previous RVM initiatives in developed countries. By integrating sensors, motors, Arduino-based smart control systems, and a reward module, this project is expected to contribute to increasing public recycling awareness and help create a cleaner and more sustainable environment. Based on the conducted studies, the proposed RVM is considered relevant, practical, and aligned with current societal needs.
Keywords: Reverse Vending Machine (RVM), Arduino, Recycling, Automation, Cash Rewards

Collaborative Digital Storytelling Platform for TESL Writing and Speaking

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Abstract - The acquisition of English as a Second Language (ESL) among Teaching English as a Second Language (TESL) students is frequently constrained by the compartmentalised instruction of writing and speaking skills, resulting in fragmented language development. This study introduces a Collaborative Digital Storytelling Platform designed to integrate these skills within a unified pedagogical framework. Implemented through Telegram, the platform enables learners to co-construct narratives sequentially by alternating between written contributions and oral narration, thereby fostering collaboration, interaction, and immediate peer feedback. Grounded in process-based learning, the approach seeks to enhance creativity, linguistic accuracy, and communicative competence. The platform incorporates multiple affordances, including drag-and-drop story sequencing, embedded grammar support, speech-to-text pronunciation aids, and peer-comment functions, all of which contribute to improved usability and learning outcomes. By leveraging Telegram's accessibility and multimedia features, the intervention addresses persistent challenges in ESL instruction, such as isolated skill practice, low learner engagement, and delayed feedback. The implications extend beyond individual learners to encompass pedagogical practices, institutional strategies, and broader societal outcomes. Specifically, the platform advances the integration of language skills, promotes collaborative pedagogy, and cultivates digital literacy. This study positions digital storytelling as an innovative and adaptable approach to bridging the gap between writing and speaking proficiency in TESL education.

Keywords: TESL, digital storytelling, integrated skills, language pedagogy, digital literacy

Traffi-Logi: PLC Training Kit Using Traffic

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Abstract - Programmable Logic Controllers (PLCs) play a critical role in industrial automation, yet teaching students how to program them effectively remains a challenge. Most classroom practice relies on online simulators, which display ladder diagrams and output bits in an abstract form. While this helps in understanding programming syntax, it does not provide students with a tangible sense of how their logic translates into real-world effects. To address this gap, this project introduces Traffi-Logi: Traffic Light Simulator using PLC, an innovative educational kit that combines software simulation with physical demonstration. Students begin by programming a traffic light sequence in an online PLC simulator, after which a web crawler extracts the output signals. These signals are transmitted to a traffic light training kit and a set of toy trains equipped with microcontrollers, all coordinated by a laptop acting as the master controller. The trains respond to the programmed light sequence, moving on green and stopping on red. If students design a faulty sequence, multiple trains may enter the intersection simultaneously, leading to a collision. This direct cause-and-effect observation allows students to understand the consequences of their programming decisions. The system provides a more engaging, realistic, and hands-on learning experience compared to abstract simulation alone. By integrating visualization, physical interaction, and problem-solving, Traffi-Logi enhances students' mastery of sequencing, timing, and safety in PLC-based control systems, preparing them for real industrial applications.

From Oil to Sun: Unlocking Indonesia's Solar Energy Potential

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Polytechnic Energy and Mineral Akamigas

Abstract - Indonesia stands at a critical crossroads in its energy future. Despite declining domestic oil and gas reserves and increasing reliance on costly imports, the nation continues to depend heavily on fossil fuels, which currently dominate more than 80% of the energy mix. At the same time, Indonesia possesses an immense solar energy potential exceeding 3,000 GW, yet by 2023 only 573 MW (<0.05%) has been installed, revealing a striking gap between opportunity and realization. This poster highlights the strategic role of solar energy in achieving the national target of 23% renewables by 2025 and in securing long-term energy independence. The analysis is based on official statistics (BPS, ESDM), national energy planning documents (PLN RUPTL 2021–2030), and global and national studies (IEA, IRENA, IESR), providing an integrated perspective on Indonesia's energy transition. Results show that solar power offers unmatched advantages: nationwide technical availability, flexibility across rooftop PV systems, utility-scale solar farms, and hybrid solutions, as well as significant environmental benefits through CO_2 reduction. Beyond its technical feasibility, accelerating solar deployment is critical for reducing fossil fuel dependency, lowering import burdens, and enhancing resilience to climate change. In conclusion, transitioning From Oil to Sun is not merely a technological choice but a national imperative to reshape Indonesia's energy landscape. By unlocking its vast solar potential, Indonesia has the opportunity to fuel sustainable growth, strengthen energy security, and lead the way toward a cleaner, more resilient future.

Fitspin Wash

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Abstract - Obesity and the lack of physical activity among teachers and students present a major health concern across the whole world and the need of energy-saving measures with a lower reliance on energy draw more and more attention. Here is a cycling-powered washing machine designed to suit school conditions, which combines physical exercise and an essential daily routine. It can be activated as it is pedaled, hence promoting exercise, as well as it uses less electricity due to its nature of working only during the action of pedalling. There was the development of a prototype by modifying a bicycle mechanism into a washing mechanism alongside a washing drum, where moderate measures of physical effort were required to go through the mechanism and accomplish a washing cycle. The machine, built using a design-build test strategy, used locally sourced recycled materials, maximized its torque efficiency, and was tested in a school environment. Five students participated in a two-week trial, during which data were gathered through observation, surveys, and records of usage. Results showed that eighty-five percent of the subjects liked the activity and were interested in using it regularly. On average, nearly 12-15 minutes of peddling time per cycle were achieved, which facilitated exercising daily and fully washing clothes with no electricity. Curiosity about sustainability and mechanical systems was also elicited by the project, which can prove to be tremendously educational. This research adheres, the innovation of this purposeful design of exercises as a routine activity is capable of fostering health, sustainability, and experiential learning. This innovation is capable of providing a reasonably affordable invention at schools and represents the pathway between health operations and mechanical creativity.

Keywords: Cycling washing machine, sustainability, physical activity, prevention of obesity

Unlock the Magic of Learning, Playing, and Reading: I SaBoBa Module

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Abstract - Mastery of reading skills in the Malay language during the preschool years serves as a critical foundation for future academic success in Malaysia. However, non-native speakers frequently exhibit significant deficiencies in this area. These challenges persist despite attendance at preschool, indicating a lack of instructional resources that adequately address their specific learning needs. In response to this gap, the present study investigates the effectiveness of the innovative I-SaBoBa module, designed using the ADDIE model and enhanced with digital elements such as augmented reality and interactive games, in improving Malay reading skills among preschoolers in SJK(T). Utilising a quantitative quasi-experimental approach with pre-test and post-test assessments, the research engaged 64 preschool children, evenly divided into experimental and control groups. The I-SaBoBa module was systematically developed in accordance with the phases of the ADDIE model and principles of digital learning. Data were analysed using ANCOVA to control for initial group differences. The findings indicated significant improvements in the experimental group compared to the control group, with all hypotheses confirmed ($p = 0.00$, $p < 0.05$). The results affirm the module's effectiveness in enhancing vowel and consonant pronunciation, KV syllable decoding, word recognition, and sentence reading. This innovative intervention provides systematic and structured methodologies for developing reading skills, particularly benefiting non-native speakers. It supports Sustainable Development Goal 4.6 and contributes to the targets set forth in Curriculum 2027, which emphasises the mastery of foundational literacy.

MyOneGov

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Universiti Pertahanan Nasional Malaysia

Abstract - Accessing Malaysian government services often involves navigating numerous fragmented portals, leading to inefficiency, user frustration, and digital exclusion—especially among rural communities, the elderly, and marginalized groups. In response, this project introduces MyOneGov, a unified digital platform that consolidates diverse public services—ranging from education and housing to healthcare and financial aid—under a single, user-friendly interface. Guided by Human-Computer Interaction (HCI) and inclusive design principles, MyOneGov aims to streamline service discovery, simplify application processes, and empower users through transparency and accessibility. The system includes core features such as a centralized dashboard, multilingual AI chatbot, smart reminders, and real-time progress tracking. The platform was developed through a Design Thinking methodology, including problem research, persona-based ideation, prototyping (low- and high-fidelity), and usability testing. Results from preliminary user testing (students, jobseekers, and low-income users) demonstrated increased satisfaction, reduced confusion, and improved access to aid-related information. This paper discusses the systemic fragmentation of existing e-Government services, presents the conceptual design of MyOneGov, and outlines how digital integration can promote greater trust, transparency, and efficiency in public service delivery. By modernizing the way citizens engage with government services, MyOneGov serves as a scalable blueprint for Malaysia's digital transformation journey—one that is citizen-centric, inclusive, and ready for national deployment.

Network Pharmacology Made Simple: An Educational Innovation for Multi-Target Drug Discovery through a Bilingual Workbook and Course Module

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Abstract - The traditional "one drug–one target" paradigm has guided drug discovery for decades but remains insufficient for tackling complex diseases such as cancer, metabolic disorders, and neurodegenerative conditions. Conversely, network pharmacology presents a holistic, multi-target strategy that combines pharmacology, systems biology, and bioinformatics to map drug–target–pathway interactions. Despite its transformative promise, network pharmacology is seldom accessible to undergraduates and early-career researchers due to its computational complexity, dependence on advanced bioinformatics tools, and technical jargon. To bridge this gap, the project Network Pharmacology Made Simple introduces a bilingual workbook and structured course module that translates advanced concepts into student-friendly formats. The workbook uses step-by-step explanations, diagrams, glossaries, and QR-linked online resources. At the same time, the 14-week course integrates lectures with guided laboratory sessions and case studies of local medicinal plants such as Acalypha indica Linn. This hybrid design scaffolds student learning from fundamental concepts to practical mini projects, fostering engagement, independence, and scientific literacy. Anticipated outcomes include the publication of an ISBN-registered bilingual workbook, a reusable and scalable elective module, and measurable improvements in comprehension and research preparedness, supported by pilot testing and feedback. Beyond individual learning, the project promotes inclusivity through bilingual education, supports Sustainable Development Goal (SDG) 4: Quality Education, and contributes to Malaysia's capacity building in pharmaceutical sciences. With potential for digital transformation into e-learning platforms, regional dissemination across ASEAN, and collaborations with publishers and ed-tech companies, this innovation offers a sustainable and replicable model for advancing higher education in biomedical sciences.