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2nd Malaysia Sustainability
University Network
National Conference 2022

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FH JOANNEUM
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KEMENTERIAN PENDIDIKAN TINGGI

**2nd Malaysia Sustainable University
Network National Conference 2022
(MYSUN 2022)**

06th – 09th December 2022

**Campus as Living Labs for
Sustainability**

Second Edition 2022

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WELCOMING SPEECH

Assalamualaikum and a very good day,



**YH. Prof. Dato' Dr. Mohd. Roslan
Bin Sulaiman
Vice-Chancellor
Universiti Putra Malaysia**

It is my great pleasure, and on behalf of Universiti Putra Malaysia, to welcome all of you from abroad and within Malaysia to participate in the 2nd MYSUN National Conference on Sustainability and Energy Efficiency 2022. SELAMAT DATANG! I would like to extend my sincere appreciation to all the guests of honour, speakers and participants who have found the issue at hand significant and important to be addressed at international level. It is indeed an exciting time for all of us, as we are able to gather after a long period of seclusion due to the covid pandemic. UPM is very proud to be able to host this event together with partners from Universiti Teknologi Malaysia, Universiti Utara Malaysia, Universiti Teknologi MARA, Multimedia University, Universiti Malaysia Sarawak, Universiti Malaysia Pahang, Universiti Malaysia Sabah, Ministry of Higher Education, University of Alicante, Spain, Universita di Genova, Italy and FH JOANNEUM University of Applied Sciences, Austria and co funded by the Erasmus+ Programme of the European Union. This is a truly international effort to address a very pressing issue

Through this conference, we would like to engage with all of you in an open and constructive discussion about the best practices of sustainability and energy efficiency in the scope of governance, structured action, and knowledge transfers. I am very encouraged to see many participants from the experts, researchers, university officers, students and the public gathered here today to acknowledge the importance of sustainability and energy efficiency specifically on the campus that we care and love for.

The organizing committee has designed an interactive program. To give an idea of what is to be expected from this conference, the program offers various forms of presentations, including key-note speakers, paper presentations, MYSUN result showcase, white paper evaluation session and a capacity training workshop. The presentation to this conference covers current research in sustainability and energy efficiency in various fields such as engineering and human psychology.

I am proud to also indicate that consistent with the 17 Sustainable Development Goals (SDGs), UPM has undertaken different activities and programme to support the SDGs. This includes clean energy programme, biomass and biodiesel programme, installation of UPM mega solar panel system over our campus that consist of over 16 MWp as the biggest in higher learning institution in Malaysia, the UPM Waste Bank, Greener than Green programme, Cleaner than Clean programme; and the Carbon Footprint Reduction programme, Green@UPM info website, Green Mandate, Nature Education Camp and Tree Planting and many more.



As a premier institution of higher learning in Malaysia, widely recognized for leadership in research and innovation, UPM is ranked 27th in the world, as the most sustainable universities in the world by UI-Greenmetric World University Ranking 2021. These achievements indicate our capabilities, efforts, and commitments towards a sustainable environment.

As a Research University, we have an obligation to assist in providing human capital training and facilities for high-impact research on addressing climate change. UPM provides a broad research base, which covers various fields of studies for multidisciplinary and integrative studies.

The UPM Green Policy has adopted five major pillars consisting:

- 1. awareness and education,*
- 2. biological diversity,*
- 3. greenhouse gases,*
- 4. waste management,*
- 5. concept of sustainable development and planning*

We are proud to welcome the participation of decision-makers of government agencies from the Federal, State and Local levels; industry players; researchers and academicians to this conference. I hope that this conference will be an excellent platform for sharing knowledge and experience on the issues pertaining the sustainability and energy efficiency issues. Immediate action is therefore necessary to overcome the impacts of this issues in future.

Local and international experts have been lined up as the keynote speakers for this conference. We would like to express our uttermost gratitude for your presence despite having a very busy schedule.

I am certain that this program will prompt a fruitful discussion and will project researchers to new developments.

I congratulate the organizing committee in particular the Conference Chair, Prof. Dr. Alyani Ismail who led the management of this conference with skills, creativity, expertise, and wisdom. Thank you for successfully coordinating the team and making the organization of this conference a success for having the foresight to organize this very timely international conference.

Leverage the upcoming sessions to build networks and exchange ideas through active participation in discussions and presentations. We hope that this conference and the launching of MYSUN Network would bring significant benefits to everyone in their efforts to practice sustainable approaches in their own beloved campus.

Thank you and enjoy your stay.

FOREWORD

Assalaammu'alaikum wr. wb. and a very warm greeting from Universiti Putra Malaysia (UPM).



Prof. Dr. Alyani Binti Ismail
Chairman
2nd Malaysia Sustainable
University Network National
Conference (MySUN) 2022

It gives me great pleasure to welcome all the respected distinguished guests, presenters and participants of the 2nd MYSUN National Conference on Sustainability and Energy Efficiency 2022 here at UPM on the 6 – 7 December 2022. Indeed, as a university committed to sustainability initiatives, UPM as MYSUN Project Coordinator is honoured to be the host of this conference, following the first conference that was held in Universiti Malaysia Sabah.

UPM has been very committed in supporting sustainability efforts while continuously playing the role as a higher learning institution that is passionate in disseminating knowledge through various activities and initiatives, in line with UPM Strategic Plan 2021-2025 under Goal 5 includes the objective to cultivate green practices for sustainable development.

This conference has attracted a total of 155 pre-registered participants, thus reflecting an overwhelming response to the conference and the great interest on the conference theme. The participants are offered either to present virtually or to attend the conference physically, following post-pandemic flexible practices of hybrid conference.

MYSUN 2022 conference is particularly significant as it provides an even greater platform for academics, sustainability experts and industry players to gather and exchange information that are vital in promoting sustainability efforts particularly in Malaysia. This time, Malaysia Sustainable University Network (MYSUN) as a national network will be officially launched during the conference. MYSUN network will now be opened for new membership applications from any higher education institutions in Malaysia on the road to transform our campuses into sustainable campus. Therefore, I hope the success of this conference will pave the way for more interesting and impactful MYSUN initiatives in the future. We would like to extend our sincere appreciation especially to all MYSUN university partners in Malaysia. Our utmost gratitude also goes to ERASMUS+ Programme of the European Union as the main sponsor of the MYSUN project. I wish all of you a pleasant experience in this conference



FOREWORD



**Prof. Dr. Mohd. Hasnain bin Md
Hussain
Co-Chairman
2nd Malaysia Sustainable
University Network National
Conference (MySUN) 2022**

Assalamualaikum and Salam Sejahtera,

I am very honoured to welcome all participants of the 2nd Malaysia Sustainable Network National Conference 2022 (MYSUN 2022) and its accompanying workshop on 6th – 7th December 2022. This is the second conference on sustainability organised by MYSUN partners, with UPM as the main organiser, co-organised by other partner universities in the MYSUN network.

As Malaysia's leading university sustainability network, MYSUN aims to address the challenges related to sustainability in higher education institutions and in many areas, including the management and operations of sustainable university campuses, promotion of sustainability that will benefit internal and external stakeholders, intercultural awareness and understanding, and promoting and supporting national-level collaboration through a sustainable platform.

Organising this conference will be the best platform for sustainability experts, enthusiasts and advocates to network and actively participate in the core activities of HEIs, in many areas, including research, educational programmes, societal and community activities, environmental management, operational activities and services on campus to name a few. In addition, the workshop organised in conjunction with this conference is hoped to provide the opportunity for the participants to replicate the establishment of the sustainable office in their organisations, establishing networks and promoting sustainability practices inter and intra organisations.

I would like to take this opportunity to thank and express my gratitude to MYSUN Partners in Malaysia and the EU, especially the organising committee, for their hard work in ensuring the smooth execution of this conference. Also, thank all distinguished guests, keynote and plenary speakers, presenters and participants, speakers and session chairs for their support and ensuring the conference's success. I sincerely thank the Erasmus+ Programme of the European Union for co-financing the MYSUN Project.



PLENARY SPEAKER 1

Prof. Ir. Ts. Dr. Nor Kamariah Noordin

Universiti Putra Malaysia, Malaysia



Nor Kamariah Noordin received her B.Sc. degree in Electrical Engineering with a major in Telecommunication from University of Alabama, Tuscaloosa USA in 1987, a master's degree from Universiti Teknologi Malaysia and a PhD from Universiti Putra Malaysia (UPM). She has been with UPM since 1988 and was appointed associate professor in 2006 and professor in 2012. During her tenure she has been the head of department, deputy dean of academics, Director of Corporate Strategy and Communication of the university and now the Dean of Faculty of Engineering. During her more than 25 years with the university she has published more than 300 journals and conference papers. She has secured more than 30 research and consultancy projects worth USD 5mil in the area of Wireless and Communication Engineering and also Engineering Education.

For the past 5 years she has started to collaborate with European partners in Erasmus and Erasmus+ and had secured 4 capacity building projects totalling to USD 2 mil.

She is the referral person in Outcome based education both at the university and national levels. She is currently the Associate Director of Electrical Engineering branch at the Engineering Accreditation Department. She is also the Vice President of Malaysia Society of Engineering and Technology (MySET).



KEYNOTE SPEAKER 1

Assoc. Prof. Dr. Dahlia Zawawi

Universiti Putra Malaysia, Malaysia



Dahlia Zawawi obtained her BSc. degree with a double major in Economics and Management at University of Missouri-Columbia, United States of America in 1997. In 2007 she completed her Ph.D. at University of Reading, United Kingdom for a thesis on cross-cultural values. She is currently the Deputy Director of Centre for Corporate Strategy and Relations, Universiti Putra Malaysia. Her current research interests are in the fields of people's behaviours in regards of cross-cultural issues, values, and emotions.

KEYNOTE SPEAKER 2

Prof. (FH) Mag. Dr. Harald A. Friedl

FH JOANNEUM, Austria



Harald A. Friedl is Associate Professor for Ethics and Sustainability in Tourism at FH JOANNEUM - University of Applied Sciences, Institute for Health and Tourism Management in Bad Gleichenberg, Austria. He holds a PhD in philosophy with the focus on modernisation and social change in traditional societies. His approach to social systems has been influenced by his twenty years of working as a tour guide alongside research and teaching. He is currently working on innovative ways to promote social transition processes that lead to cooperation, peace and sustainable living in a healthy environment. He is a co-founder of the international think tank “Action for Climate in Tourism Network” (ACTnetwork) and a member of the Scientific Advisory Board of the “Tourism Panel for Climate Change”, launched at the COP27.



KEYNOTE SPEAKER 3

Assoc. Prof. Dr. Michela Robba

University of Genova (UNIGE), Italy



Michela Robba is Associate Professor of Systems Engineering at University of Genoa. She received the Degree in Environmental Engineering in 2000, and the PhD in Electronic and Computer Engineering in 2004, from the University of Genova. The research activity is in the field of optimization and control of smart grids, electric vehicles, renewable energy resources, and natural resources management. From 2012, she is working at the Savona Campus pilot site (an innovative energy research infrastructure that includes a microgrid, renewables, and a smart building) to test different algorithms and energy management systems.

She is a member of the scientific board of the Italian Energy Technological Cluster, and of the Liguria Region Innovation Pole on Energy, Environment and Sustainable Development. She is the President of Liguria Region (Italy) Energy Consortium, and she has been scientific responsible of several National and International research projects on smart grids, Electrical vehicles, and polygonation microgrids. From 2019, she is Associate Editor of IEEE Transactions on Automation Science and Engineering.

She has joined several International Programme Committees at conferences in the field of control and optimization, she is member and vice-chair of different IFAC Technical Committees, and she has been Chair of publications and Editor for the IFAC IAMES 2022 workshop. Actually, she is lecturer for the courses "Simulation of energy and environmental systems", "Models and methods for Energy Engineering", and "Methods and models for logistics" at the Polytechnic School of University of Genova. She is author of more than 130 publications in international journals, books and proceedings of international conferences.

KEYNOTE SPEAKER 4

Assoc. Prof. Dr. Wan Zuhainis Saad

Former Director
Academic Excellence Division
Department of Higher Education
Ministry of Higher Education Malaysia



An associate professor in Microbiology in the Faculty of Biotechnology and Biomolecular Sciences, Universiti Putra Malaysia. She was the former Director of Academic Excellence Division, Department of Higher Education, Ministry of Higher Education Malaysia from 2018 to 2022. Research activities includes drug discoveries from thermophilic fungi, microbial enzymes technology in natural fiber and awarded patents for the research. Eleven copyrights received for E-learning products, e.g., Mighty Microbes, Microtropia Land Game Board with Augmented Reality. An Educational Technology enthusiast. Practices learning with technology in enhancing effective and meaningful learning. A strong advocate of empowering learners in experiential learning. She developed innovative project-based learning with her students including The Awesome Microbes Carnival, 2015& 2018, Virtual Microbes, 2016-2017, Microbes Innovation, Invention and Ideation Challenge (MINIC) 2017-2018.

She has been awarded: Creative and Interactive E-Learning Award, International University Carnival on E-Learning (IUCEL) 2016. Best Trend Setter Award in IUCEL 2017. Winner of the Reimagining and Redesigning Higher Education (Virtual Immersive Learning Experience Category) 2017. Winner of the National Academic Award (Teaching Award – Pure Science Cluster) 2018.

She has introduced innovative academic excellence initiatives including Experiential Learning and Competency Based Education Landscape (EXCEL), Service-Learning Malaysia University for Society (SULAM), Future Workforce Engagement Series (ForCES) and many more. She is currently the Adjunct Professor for the Faculty of Applied Sciences in UCSI and the Advisory Board Members for the UK-Malaysian University Consortium.

KEYNOTE SPEAKER 5

Prof. Dr. Salvador Ivorra

Vice-Rector for Infrastructure, Sustainability and Occupational Safety
University of Alicante, Spain



Salvador Ivorra is presently the Vice-rector for Infrastructure, Sustainability and Occupational Safety at the University of Alicante (UA) in Spain, and is also a full professor in the area of Continuum Mechanics and Structure Theory at UA's Department of Civil Engineering, and the coordinator of the research group GRESMES. He holds a PhD in Industrial Engineering (Mechanical Engineering) from the Polytechnic University of Valencia (Spain) and is certified as a University Specialist in Occupational Risk Prevention by the same university.

His research activity has been focused on the dynamic behaviour of structures and structural reinforcement, and he has devoted an important part of his research to the structures belonging to the historical heritage. As of November 2021, he has authored 81 scientific articles, 62 of them in JCR-indexed journals, more than 120 papers in congresses, and has directed 17 doctoral theses. He has participated in 29 competitive research projects, 17 as senior researcher, and in more than 200 research and technical assistance contracts with public agencies and private companies. He has been responsible for the coordination of a project financed with €2,000,000 from EU FEDER funds for the construction of the University of Alicante's Civil Engineering research laboratory. He is co-inventor of two patents.

He was awarded the Teaching Excellence Award by the UA Social Council in 2010. In 2015, the Kiss Bridge pedestrian footbridge in Pilar de la Horadada (Alicante), which he co-designed, was nominated by the FIB as one of the best concrete works in 2009- 2014. In 2002 he co-designed the UPV Tower in Valencia, the highest tower which was completely FRP-developed in Europe in this period. In 2019 he received the prize of the Association of Structural Consultants for the intervention project in the 'La Paz' masonry chimney. In 2019 he received the Outstanding or Productive Young Researcher Award from the Latin American Association for Quality Control, Pathology and Construction Recovery (Alconpat).

KEYNOTE SPEAKER 6

Cristina Beans

Senior Project Manager
Institutional Project Management Office (OGPI)
University of Alicante, Spain



Cristina Beans is a Senior Project Manager in the Institutional Project Management Office (OGPI) at the University of Alicante (UA) in Spain. Her background is in the Marine Sciences (B.Sc. in Marine Biology from the University of Alicante in 1999 and a M.Sc. in Oceanography from the University of Liège, Belgium, in 2001) and worked as an oceanographer at the University of Liège from 2001-2007 doing research on marine ecotoxicology in the North Sea and plankton ecology in the Antarctic. Since obtaining an MBA in Project Management in 2014 (from the Instituto Europeo de Postgrado & CEU San Pablo in Spain), she has worked in project management of EU-funded capacity building in higher education (CBHE) projects at the University of Alicante.

For the past 8 years she has coordinated, and acted as a partner on UA's behalf, in over 20 projects in the Erasmus+ CBHE, Tempus IV, ACP-Edulink, H2020 and FP7 programmes, with partners from Europe, Central Asia, Southeast Asia, Africa and Latin America. She has been responsible for overall project management, organising and delivering training workshops, conferences and other events, preparation of reports and dissemination of project activities and results, as well as reviewing and drafting project proposals on topics related to research management, climate change, employability and entrepreneurship or sustainable campus development.

CONFERENCE AGENDA

06 Dec 2022 (Tuesday)

DAY 1: Tuesday, December 6th, 2022 Venue: Hybrid				
TIME (GMT+8)	AGENDA		VENUE (ON-SITE ATTENDEES)	LINK (ONLINE ATTENDEES)
07:45 - 08:30	Registration		Auditorium Rashdan Baba, UPM	
08:30 – 11.00	Session 1 Chair: Dr Chan Kar Hoong (Online session) (10-15 min/speaker)	Session 2 Chair: Assoc Prof. Dr. Natrah Saad (Hybrid session) (10-15 min/speaker)	Session 2: Auditorium Rashdan Baba, UPM	Session 1: Online via ZOOM Link 1: https://zoom.us/j/96909324960?pwd=VGRXN3Z4aStmV1d5bTVmR25Ma0RiUT09 Meeting ID: 969 0932 4960 Passcode: 899641
				Session 2: Online via ZOOM Link 2: https://zoom.us/j/94356120810?pwd=NHFDSkFyTW1FNmpgTjFQaFFoQWo3Zz09 Meeting ID: 943 5612 0810 Passcode: 168236
11:00 - 11:30	Coffee Break			

<p>11:30 - 12:00</p>	<p>Keynote #1 (Hybrid)</p> <p>Chair: Prof. Ts. Dr. Hamzah Ahmad</p> <p>UPM Initiatives towards exemplary Sustainable and Green Campus</p> <p>Assoc. Prof. Dr. Dahlia Zawawi Deputy Director Center for Corporate Strategy and Relations Universiti Putra Malaysia</p>		<p>Keynote #1:</p> <p>Auditorium Rashdan Baba, UPM</p>	<p>Keynote #1: Online via ZOOM</p> <p>Link 2:</p> <p>https://zoom.us/j/94356120810?pwd=NHFDSkFyTW1FNmpqTjFQaFFoQWo3Zz09</p> <p>Meeting ID: 943 5612 0810 Passcode: 168236</p>
<p>12:00- 13.00</p>	<p>Session 3</p> <p>Chair: Assoc Prof. Dr. Abentin Estim</p> <p>(Online session) (10-15 min/speaker)</p>	<p>Session 4</p> <p>Chair: Dr. Dianah Mazlan</p> <p>(Hybrid session) (10-15 min/speaker)</p>	<p>Session 4: Auditorium Rashdan Baba, UPM</p>	<p>Session 3: Online via ZOOM</p> <p>Link 1:</p> <p>https://zoom.us/j/96909324960?pwd=VGRXN3Z4aStmV1d5bTVmR25Ma0RiUT09</p> <p>Meeting ID: 969 0932 4960 Passcode: 899641</p> <hr/> <p>Session 4: Online via ZOOM</p> <p>Link 2:</p> <p>https://zoom.us/j/94356120810?pwd=NHFDSkFyTW1FNmpqTjFQaFFoQWo3Zz09</p> <p>Meeting ID: 943 5612 0810 Passcode: 168236</p>
<p>13:00 - 14:00</p>		<p>Lunch Break</p>		

<p>14:00 - 14:30</p>	<p>Keynote #2 (Online)</p> <p>Chair: Prof. Dr. Mohd. Hasnain bin Md Hussain</p> <p>Brain-based Challenges and Strategies of Changing Academic Culture into a Sustainable Campus</p> <p>Prof. (FH) Mag. Dr. Harald A. Friedl FH Joanneum, Austria</p>	<p>Keynote #2 and #3:</p> <p>Streaming live at Auditorium Rashdan Baba, UPM</p>	<p>Keynote #2 and #3: Online via ZOOM and Live Streaming</p> <p>Link 2:</p> <p>https://zoom.us/j/94356120810?pwd=NHFDSkFyTW1FNmpqTjFQaFFoQWo3Zz09</p> <p>Meeting ID: 943 5612 0810 Passcode: 168236</p>
<p>14:30-15:00</p>	<p>Keynote #3 (Online)</p> <p>Chair: Prof. Dr. Mohd. Hasnain bin Md Hussain</p> <p>The role of energy management systems for sustainable energy university campus</p> <p>Prof. Michela Robba University of Genova (UNIGE), Italy</p>		
<p>End of Day 1</p>			

07 Dec 2022 (Wednesday)

DAY 2: Wednesday, December 7th, 2022 Venue: Hybrid			
TIME (GMT+8)	AGENDA	VENUE (ON-SITE ATTENDEES)	LINK (ONLINE ATTENDEES)
07:45 - 08:30	Registration Arrival of Distinguished Guests	Auditorium Rashdan Baba, UPM	Online via ZOOM Link 1: https://zoom.us/j/96909324960?pwd=VGRXN3Z4aStmV1d5bTVmR25Ma0RiUT09 Meeting ID: 969 0932 4960 Passcode: 899641
08:30 - 08:35	Start of Opening Ceremony		
08:35 - 08:45	Opening Speech YH. Prof. Dato' Dr. Mohd Roslan Bin Sulaiman Vice Chancellor Universiti Putra Malaysia		
08:45 - 08:55	Malaysia Sustainable University Campus (MYSUN) Network Launch		
08:55 - 09:15	MYSUN Project Presentation Ybhg. Prof. Ir. Ts. Dr Nor Kamariah Noordin (UPM) MYSUN Project Coordinator		
09:15 - 09:45	Keynote #4 (Online) Catalysing Change in Higher Education for Education for Sustainable Development (ESD) Assoc. Prof. Dr. Wan Zuhainis Saad Former Director Academic Excellence Division Department of Higher Education Ministry of Higher Education Malaysia		

<p>09:45 - 10:15</p>	<p>Keynote #5 (Hybrid)</p> <p>Environmental management at the University of Alicante through collaborating companies</p> <p>Prof. Dr. Salvador Ivorra Vice-rector for Infrastructure, Sustainability and Occupational Safety, University of Alicante</p>		
<p>10:15 - 10:45</p>	<p>Keynote #6 (Hybrid)</p> <p>How to get an Erasmus+ CBHE project, and not die trying</p> <p>Cristina Beans, University of Alicante</p>		
<p>10:45 - 11:00</p>	<p>Press Conference</p>	<p>VIP Holding Room</p>	
<p>11:00 - 11:30</p>		<p>Coffee Break</p>	

<p>14:45-15:30</p>	<p>MYSUN Workshop</p> <p>Road to Sustainable Future: Universities' Responsibilities and Commitments</p> <p>Trainer: Assoc. Prof. Ts. Dr. Herma Dina Setiabudi (Deputy Director, Centre for Corporate & Quality Affairs, Universiti Malaysia Pahang)</p>	<p>Auditorium Rashdan Baba, UPM</p>	<p>Online via ZOOM</p> <p>Link 1:</p> <p>https://zoom.us/j/96909324960?pwd=VGRXN3Z4aStmV1d5bTVmR25Ma0RiUT09</p> <p>Meeting ID: 969 0932 4960 Passcode: 899641</p>
<p>15:30 - 16:00</p>	<p>Coffee Break</p>	<p>Ground Floor TNCPI Building</p>	<p>Coffee Break</p>
<p>16:00-17:00</p>	<p>MYSUN Workshop (Continued)</p>	<p>Auditorium Rashdan Baba, UPM</p>	<p>Online via ZOOM</p> <p>Link 1:</p> <p>https://zoom.us/j/96909324960?pwd=VGRXN3Z4aStmV1d5bTVmR25Ma0RiUT09</p> <p>Meeting ID: 969 0932 4960 Passcode: 899641</p>
<p>End of Day 2</p>			

The 2nd MYSUN National Conference

08 Dec 2022 (Thursday)

FOR MYSUN MEMBERS ONLY

DAY 3: Thursday, December 8th, 2022 DAY 4: Friday, December 9th, 2022		
Time/Day	DAY 3: Thursday December 8th, 2022	DAY 4: Friday December 9th, 2022
Venue	Dewan Taklimat, Faculty of Engineering, UPM (Hybrid) ZOOM Link will be provided to MYSUN Members ONLY	Muzium Melayu & The Acres by Farm Fresh, UPM
08:30 – 11:00	MYSUN Project Management Meeting	Gather at the Foyer of Auditorium Jurutera Radin Umar, Faculty of Engineering, UPM at 8.15 am
11:00 - 11:30	Coffee Break	
11:30 - 13:00	MYSUN Project Management Meeting (cont)	MYSUN Partners Networking Visit: 1. Muzium Warisan Melayu UPM 2. The Acre by Farm Fresh
13:00 - 14:00	Lunch Break	End of Day 4
14:00 – 15:45	MYSUN Project Management Meeting (Cont)	
15:45 - 16:00	Coffee Break	
16:00-17:00	MYSUN Project Management Meeting (Cont)	
18:00 – 20:00	Dinner: Peranakan Place, IOI City Mall	
	End of Day 3	

PRESENTERS PARALLEL SESSION SCHEDULE AND DETAILS

Session		Session #1 Chair: Dr Chan Kar Hoong	Session #2 Chair: Assoc Prof. Dr. Natrah Saad
Theme		Campus Management and Community Engagement/ Environmental Monitoring	Education for Sustainability
06 Dec 2022 (Tuesday) 10-15 min/speaker	8.30am -8.45am	Eileen Ting Sin Yee MYSUN/021 Awareness And Knowledge of Green Technology Among Youth in Malaysia	Prof. Dr. Alyani Ismail MYSUN/003 Conceptualizing Multi-Dimensional Model of Education for Sustainable Development (ESD)
	8.45am -9.00am	Chelsea Michcal MYSUN/038 A Preliminary Study on Sustainability in Higher Education Institutions: Students' Attitudes and Perspectives	Prof. Dr. Nor Aziah Abdul Manaf MYSUN/009 Higher Education Sustainability Practices in Malaysia
	9.00am -9.15am	Prof. Dr. Ramlan Zailani MYSUN/002 SDG7: Solar PV Installations in Malaysian University Campuses	Nalienaa A/P Muthu MYSUN/019 Leveraging Mobile Augmented Reality Technology for Sustainable Technical Vocational Education and Training
	9.15am -9.30am	J. K. Mohammed MYSUN/024 Effect Of GSM Base Stations on Residential Property Values in Bida, Nigeria	Prof. Dr. Zainuddin Abdul Manan MYSUN/037 A Blue Ocean Shift for University Sustainability
	9.30am -9.45am	Logeswari D/O Uthama Puthran MYSUN/013 The Theory of Planned Behaviour (TPB) Predictors Influencing Green Purchase Intention	Prof. Dr. Aduwati Sali MYSUN/014 STEM For All – From Sumo-Robots to Smart Bin

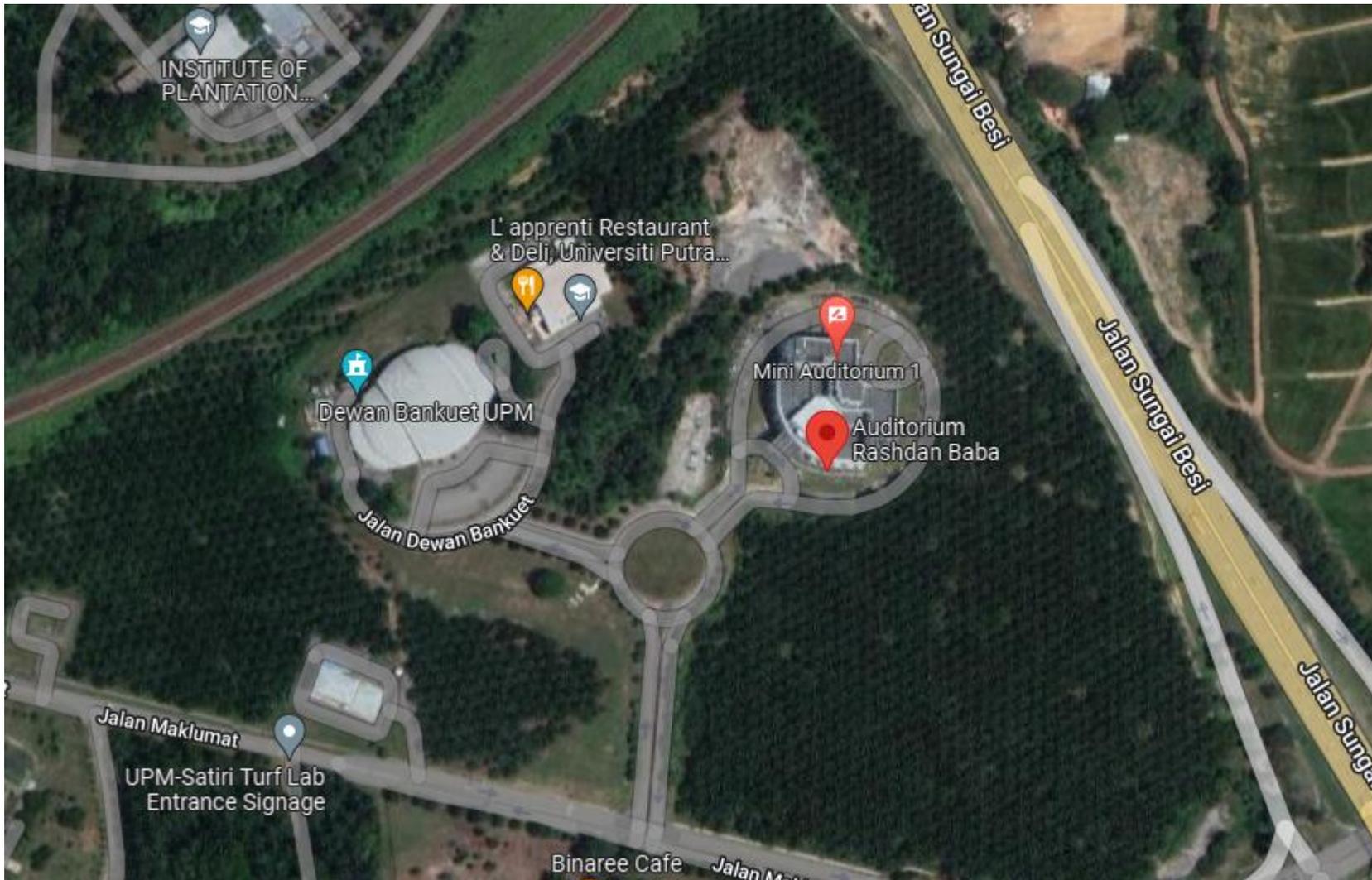
The 2nd MYSUN National Conference

9.45am -10.00am	Yakubu Aminu Dodo MYSUN/033 Estimation Of the Carbon Storage and Sequestration Potential of Urban Wayside Landscape Trees in Abu	Dr. Lai Masya Win MYSUN/029 Presence Of a Sustainable Virtual Reality Application for Assembly Tasks in Engineering Education
10.00am -10.15am	Layla Haythoor Kharboot MYSUN/031 Synthesis of NiS/rGO CE catalyst prepared by hydrothermal method for QDSSCs.	Imaduddin Hamzah MYSUN/006 How Resilience and Social Support Strengthen the Psychological Well-Being of Inmates with Life Sentences
10.15am -10.30am	Mohammed Hussein Saleh Haram MYSUN/005 Re-purposing Second Life EV Batteries as Energy Storage System: Case Study	Lee Ming Hoe MYSUN/028 Factors Influencing Academic Performance: Insights for Impactful Sustainability Educations Programs

Session		Session #3 Chair: Assoc Prof. Dr. Abentin Estim	Session #4 Chair: Dr. Dianah Mazlan
Theme		Energy Management	Waste management/ Alternative Energy
06 Dec 2022 (Tuesday) 10-15 min/speaker	12.00pm -12.15pm	Najeem Olawale Adelakun MYSUN/011 Off-Grid Renewable Energy Transition in Selected Countries in Africa: Challenges and Opportunities for Sustainable	Jamla Farhan Bt Yahya MYSUN/018 Utilization Of Tailing Ash as Adsorbent for Removal of Methylene Blue
	12.15pm -12.30pm	Aliyu Ishaq MYSUN/017 The Influence of Ammonia Nitrogen Content in Landfill Leachate on Microbial Fuel Cell Performance: A Review	Muhammad Nadzree Bin Mohd Yamin MYSUN/032 Emotion Recognition System (ERS): A Technological Effect from Pollution and Environmental Degradation
	12.30pm -12.45pm	Agung Masyad Fawzi MYSUN/025 Does Corporate Aggressive Business Decisions Reduce Energy Efficiency? The Moderating Role of Firms' ESG	Gimba Joshua Dagil MYSUN/015 DFT: B3LYP/LAN2DZ Study for The Removal of Pb, Cd, And Cu with Chitosan/Alginate Composite Adsorbents
	12.45pm -1.00pm	Hamad Mohammed Bal-Harith MYSUN/035 Investigating Daylight Harvesting in College of Engineering Najran University	Khalid Ibrahim Mohsin MYSUN/023 Review On the Capability of Biocomposite-Based Material for Thermal Insulation Application

Venue Map

Venue location link : <https://goo.gl/maps/akppnJcC4KsMHAH19>



Presentation

Plenary Speaker 1

Prof. Ir. Ts. Dr. Nor Kamariah Noordin

Universiti Putra Malaysia

The project entitled Malaysian Sustainable University Campus Network or MySUN is an Erasmus+ project awarded by European Union in January 2020. It is a project involving eight Malaysian universities, three European universities and Higher Education Department of Ministry of Higher Education. The project is organized in 8 sub-projects called work packages. In Work Package 1 (WP1) we work on literature and surveys to identify the gaps among universities in Malaysia in embracing sustainable campus at their own universities. We use the results of WP1 to identify relevant training and seminar with the help of European partners, especially in sharing their best practices of sustainability initiatives in their own campuses in WP2. We replicate the seminar by adopting and adapting the materials to suit our campus needs and conduct the training to our own campus citizen. WP3 helps to enhance understanding of sustainable campus where we ‘Bring Future Campus Today’, through Massive Online Open Course (MOOC). We have seven modules in this MOOC starting from understanding of Sustainable Development Goals to sharing of some sustainable programs and campaigns as part of showcasing university campus as sustainable living laboratories. In WP4 we focus on establishing Sustainable Office for partners not yet having the office and strengthening the current offices for partners already have them established. In this package we also establish Campus Sustainability Plan for our own university, endorsed by top university management. Wp5 was about networking with our stakeholders and being involved in organising round table discussions with various groups of campus stakeholders. As additional networking actions we have also created the MYSUN network which has organised 2 national conferences and workshops and is drafting a White Paper. WP6 involves with disseminating and publicizing activities and program conducted by MySUN to the public while WP7 in charge with ensuring that quality of the deliverables is not compromised. The overall project is managed and monitored by WP8, the Project Management.

The project has achieved significant success in terms of reaching a great number of people to raise their awareness and knowledge about campus sustainability, through training workshops, the MOOC or the round table discussions. We also held the First MySUN Conference and workshop in March 2021 and the Second MySUN Conference and workshop in December 2022. We will be launching our MySUN Network during this conference.

We faced a lot of challenges during this project since the projects started just before the COVID era. We faced difficulty travelling to partner universities for study visits, were unable to conduct meetings and training physically, and had delays in purchasing equipment for our Sustainability Offices. But we managed to overcome those challenges through the strong commitment of all the partners to the project objectives, and by developing a good online communicating strategy, organising events and trainings online and working closely with the financial offices for the purchase of equipment.

Presentation

Keynote Speaker 1

Assoc. Prof. Dr. Dahlia Zawawi

Universiti Putra Malaysia, Malaysia

UPM Initiatives towards exemplary Sustainable and Green Campus

The presentation will cover inputs on UPM's commitment to support sustainability efforts while continuously playing the role as a higher learning institution that is passionate in disseminating knowledge through teaching and research. UPM Strategic Plan 2021-2025 under Goal 5 includes the objective to cultivate green practices for sustainable development. Hence, sustainability efforts will continue to be the priority of this university with such initiatives also being regarded as crucial in ensuring that the UPM Strategic Plan 2021-2025 can be achieved successfully. UPM also aims to set an example on environment conservation and preservation for the nation.

Presentation

Keynote Speaker 2

Prof. (FH) Mag. Dr. Harald A. Friedl
FH JOANNEUM, Austria

Brain-based Challenges and Strategies of Changing Academic Culture into a Sustainable Campus

The challenge of making systems more "sustainable" is usually seen as a technical problem: Systems are analysed, framework conditions, properties and regularities are recorded, and conclusions are drawn about target-oriented interventions. Within scientific disciplines that are considered "natural sciences" by definition, this approach is self-evident because it is also due to epistemological limitations. However, as soon as the systems to be controlled are predominantly human, such as a university campus, this obvious approach is usually "forgotten". Instead, expectations dominate that the people affected would simply adapt to intended changes. Those members of the system in question who resist this change are considered as "unreasonable", "stupid" or even "malicious". So, when projects to change large social systems fail, suddenly it is the "material that is to blame", not the underlying "model" of the "material" and the approach derived from it to "process the material", i.e. - as in the case of a university campus - people.

Due to the enormous progress in brain research, we can now say what the French doctor and philosopher Julien Offray de La Mettrie had already claimed more than 200 years ago: that humans are determined in their thinking and acting by their (neuro-)biological structures, that they can be interpreted, as it were, as a "human machine", albeit an extremely complex one. We act within those neuronal variants that have been created in the respective brain in reaction to the experienced environment: A person who grew up only in the environment of Malaysian-speaking people cannot speak Japanese. His brain has not - yet - laid out the corresponding wiring. The corresponding law of nature is: "You cannot think what you have not thought!" The brain, however, is plastic. It can change through appropriate stimulation. A person who has to move to Japan as a member of the Malay language will sooner or later learn Japanese: his brain will adapt. This is what we usually call "learning", a process of neuronal change that students in particular often find painful.

La Mettrie was banished from France for his visionary view of man at a time when belief in a soul still prevailed. In the age of multiple crises (war in Europe, climate warming, energy shortage, economic recession...), "good reason" would dictate that all available disciplines be linked as much as possible in order to be able to respond to these challenges as successfully as possible. If, for example, the aim is to change a long-established, academic culture (with correspondingly neurally structured brains of its members) in the direction of a sustainable campus, we must consider the "natural law" framework conditions of the brains concerned, or

we will fail. Brains are designed for continuity for reasons of energy efficiency. Change is perceived as painful. Due to the primacy of energy efficiency, the brain reacts with high willingness to the prospect of improved chances of survival - in the form of pleasure gain. The advertising industry has long known that "you catch flies with honey" or simply that "sex sells".

If we as scientists want to taste the "sweetness of success", we must work with the existing conditions, not against them. People like Stalin, Mao or Hitler tried to change societies by force according to their simplified concepts of the "right man", with correspondingly lethal consequences. Today, we are many steps ahead and, based on the findings of behavioural economics, we know about the enormous potential of methods such as "design thinking" or "nudges" to change social systems - such as a university campus - in a refined, yet empathetic, humane, and fair way. We just need to learn better by looking closely and self-critically at the people involved. In the best case, we will be rewarded for this with success; at worst, we can learn something about the world instead of being banished for our theses, as La Mettier once was.

Presentation

Keynote Speaker 3

Assoc. Prof. Dr. Michela Robba

University of Genova (UNIGE), Italy

The role of energy management systems for sustainable energy university campus

Nowadays, universities can be regarded as an independent small city district due to their different activities which have direct and indirect impacts on the environment. A sustainable campus integrates environmental policies in educational activities, research actions, urban services and building operations. Universities focused on reducing the greenhouse gases have to pay attention to the energy supply (both thermal and electrical provisions). On this thread, energy management systems are key tools for the optimal control of such sustainable energy districts. This kind of systems, together with other campus activities (such as governance, research, mobility, building operations etc.), can contribute to the improvement of the environmental performances. Since 2011, the University of Genoa started its sustainability commitment by focusing research and projects on Sustainable Energy and Smart City the campus located in Savona city. This presentation will be focused on the Savona Campus and how it can be used as a sustainable pilot site. Optimization models and methods embedded in the energy management and automation systems will be highlighted, together with the possible use cases in sustainable campuses. Moreover, the ongoing projects on these topics will be shown too.

Presentation

Keynote Speaker 4

Assoc. Prof. Dr. Wan Zuhainis Saad

**Former Director
Academic Excellence Division
Department of Higher Education
Ministry of Higher Education Malaysia**

Catalysing Change in Higher Education for Education for Sustainable Development (ESD)

The transformation of society in the direction of a more sustainable future is fundamentally influenced by higher education institutions (HEIs). Institutions of higher education are at the forefront of the transition to sustainable development through knowledge generation, dissemination, research, education, and outreach.

The provision of the human resources required to enable sustainable development, stretching from urban areas to the global sphere, is the responsibility of HEIs. In addition to promoting environmental awareness, education for sustainable development (ESD) also emphasises the need for relevant experiences and healthy habits, fostering the critical thinking necessary to motivate students to create more sustainable communities. ESD motivates students' cognitive, emotive, and participatory knowledge while also improving their skills and behaviour in order to help create an environmentally preferable outcome. ESD also encourages new ways of thinking and doing in support of the environment and society. Ethics, transparency, and accountability are the cornerstones of sustainability. Flexible learning pathways in higher education also support ESD. Therefore, they must be considered in every process of the institution and these concepts must be transmitted to the students. There are many ways to incorporate ESD into our lives. We can start by making small changes in our daily routines.

Presentation

Keynote Speaker 5

Prof. Dr. Salvador Ivorra

**Vice-Rector for Infrastructure, Sustainability and Occupational Safety
University of Alicante, Spain**

The University of Alicante (Spain) manages all the services for a population of some 30,000 people who travel daily to the campus to carry out their teaching, research and transfer activities. The campus occupies an area of about 800,000 m² in the main campus and about 200,000 in its current new expansion campus. The urban development was planned with a low buildable rate (16% of the campus area) and large garden areas in a region where the climate is hot and the availability of water is very low. 82% of the surface of the campus is free of motor vehicle traffic and approximately 66% of the surface is pedestrian and landscaped areas (38.5% correspond to landscaped areas and 27.66% correspond to pedestrian areas). The irrigation system is based on the use of groundwater, brackish that is necessary to desalinate and store in a series of artificial lakes. The use of treated wastewater is being planned.

Environmental management is carried out through different services, mainly through the Ecocampus Office and the Infrastructure and Services Service, from where numerous tasks are outsourced such as cleaning, gardening, maintenance, waste management with selective collection, management of hazardous waste. All collaborating companies that manage these outsourced tasks are required to comply with a series of requirements that facilitate the improvement of the environmental sustainability of the campus.

The UA annually evaluates the quality of water, soil and air, either through contracts with internal researchers or through outsourcing. In the same way, the University of Alicante makes an annual assessment of the impact caused by its activity in terms of CO₂ eq. emissions, thanks to the calculation of its carbon footprint. Knowing the carbon footprint has made it possible to establish an improvement plan whose progressive implementation has drastically reduced CO₂ emissions into the atmosphere, derived from the activity of the UA. The ISO 14001 implementation service for environmental management is currently being outsourced

Presentation

Keynote Speaker 6

Cristina Beans

Senior Project Manager
Institutional Project Management Office (OGPI)
University of Alicante, Spain

The EU's Erasmus+ programme started in January 2014, with the combination of all of the EU's schemes for education, training, youth and sport, including the previous international co-operation programmes Erasmus Mundus, Tempus, Edulink and Alfa. The focus of the 2021-2027 Erasmus+ programme is on social inclusion, the green and digital transitions, and promoting the participation of young people in democratic life.

It could be said that the crown jewel of the Erasmus+ programme, in terms of international cooperation with countries outside the EU, is the Capacity Building in Higher Education programme (CBHE). These projects promote cooperation partnerships that have an impact on the modernisation and internationalisation of higher education institutions (HEIs) and systems in partner countries. They are highly sought after by institutions around the world, bringing together HEIs from different countries (EU and others) to cooperate in developing the quality of HEIs in eligible partner countries. Topics in Erasmus+ CBHE projects vary from the creation of Masters' programmes in a wide range of subjects, to the development of internationalisation strategies, improving the accessibility of the university for students with disabilities, strengthening relations with the business sector to better support students' employability and entrepreneurship efforts, or creating a more sustainable university campus, among many others. In 2022 619 CBHE applications were submitted to the EU, with only 238 reaching a sufficient score (>60/100) to be eligible for funding, barely a 38% eligibility rate.

What does it take to prepare a proposal that will reach that eligibility threshold and have a chance at being selected for funding? Over the past 20 years, the University of Alicante's Institutional Project Management Office (OGPI) has participated in over 200 European projects, including since 2014 42 Erasmus+ CBHE projects, of which 12 were submitted and coordinated by the OGPI team. In this session we will share some key insights into how we survive the Erasmus+ CBHE proposal drafting process and come out the other side with a couple of proposals selected for funding each year.

LIST OF ABSTRACTS

Topics of interest for submission include, but are not limited to:

1. Net-Zero
2. Energy Management
3. Waste Management
4. Cooling Technology
5. Alternative Energy
6. Energy Communities
7. Transportation
8. Environmental Monitoring
9. Campus Management and Community Engagement
10. Campus Governance
11. Education for Sustainability

ID No.	Title	Corresponding Author	Organization	Theme
MYSUN/002	SDG7: Solar PV Installations in Malaysian University Campuses	Prof. Dr. Ramlan Zailani	Universiti Teknologi Mara, Malaysia	Alternative Energy
MYSUN/003	Conceptualizing Multi-Dimensional Model of Education for Sustainable Development (ESD)	Prof. Dr. Alyani Ismail	Universiti Putra Malaysia	Education for Sustainability
MYSUN/006	How Resilience and Social Support Strengthen the Psychological Well-Being of Inmates with Life Sentences	Imaduddin Hamzah	Correctional Science Polytecnic	Campus Management and Community Engagement
MYSUN/011	Off-Grid Renewable Energy Transition in Selected Countries in Africa: Challenges and Opportunities for Sustainable	Najeem Olawale Adelakun	Federal College of Education, Nigeria.	Energy Management
MYSUN/012	Mysun's White Paper: Energy in The Context of Sustainability at Higher Education Institutions	Dr. Robert Francis Peters	Universiti Malaysia Sabah	Campus Management and Community Engagement
MYSUN/013	The Theory of Planned Behaviour (TPB) Predictors Influencing Green Purchase Intention	Logeswari D/O Uthama Puthran	Institut Aminuddin Baki (Cawangan Utara)	Education for Sustainability
MYSUN/014	STEM For All – From Sumo-Robots to Smart Bin	Prof. Dr. Aduwati Sali	Universiti Putra Malaysia	Campus Management and Community Engagement
MYSUN/015	DFT: B3LYP/LAN2DZ Study for The Removal of Pb, Cd, And Cu with Chitosan/Alginate Composite Adsorbents	Gimba Joshua Dagil	Universiti Teknologi Malaysia	Waste Management
MYSUN/017	The Influence of Ammonia Nitrogen Content in Landfill Leachate on Microbial Fuel Cell Performance: A Review	Aliyu Ishaq	Universiti Teknologi Malaysia	Energy Management
MYSUN/018	Utilization Of Tailing Ash as Adsorbent for Removal of Methylene Blue	Jamla Farhan Bt Yahya	Universiti Putra Malaysia	Waste Management
MYSUN/019	Leveraging Mobile Augmented Reality Technology for Sustainable Technical Vocational Education and Training	Nalienaa A/P Muthu	Universiti Putra Malaysia	Education for Sustainability
MYSUN/021	Awareness And Knowledge of Green Technology Among Youth in Malaysia	Eileen Ting Sin Yee	Universiti Teknologi Malaysia	Education for Sustainability

ID No.	Title	Corresponding Author	Organization	Theme
MYSUN/023	Review On the Capability of Biocomposite-Based Material for Thermal Insulation Application	Khalid Ibrahim Mohsin	Universiti Putra Malaysia	Alternative Energy
MYSUN/024	Effect Of GSM Base Stations on Residential Property Values in Bida, Nigeria	J. K. Mohammed	Federal Polytechnic, Nigeria	Environmental Monitoring
MYSUN/025	Does Corporate Aggressive Business Decisions Reduce Energy Efficiency? The Moderating Role of Firms' ESG	Agung Masyad Fawzi	Universiti Utara Malaysia	Energy Management
MYSUN/028	Factors Influencing Academic Performance: Insights for Impactful Sustainability Educations Programs	Lee Ming Hoe	Multimedia University Melaka	Education for Sustainability
MYSUN/029	Presence Of a Sustainable Virtual Reality Application for Assembly Tasks in Engineering Education	Dr. Lai Masya Win	Universiti Putra Malaysia	Universiti Utara Malaysia
MYSUN/032	Emotion Recognition System (ERS): A Technological Effect from Pollution and Environmental Degradation	Muhammad Nadzree Bin Mohd Yamin	Multimedia University	Environmental Monitoring
MYSUN/033	Estimation Of the Carbon Storage and Sequestration Potential of Urban Wayside Landscape Trees in Abu	Yakubu Aminu Dodo	Najran University, Kingdom of Saudi Arabia	Environmental Monitoring
MYSUN/035	Investigating Daylight Harvesting in College of Engineering Najran University	Hamad Mohammed Bal-Harith	Najran University	Energy Management
MYSUN/037	A Blue Ocean Shift for University Sustainability	Prof. Dr. Zainuddin Abdul Manan	Universiti Teknologi Malaysia	Campus Management and Community Engagement
MYSUN/009	Higher Education Sustainability Practices in Malaysia	Prof. Dr. Nor Aziah Abdul Manaf	Universiti Utara Malaysia	Education for Sustainability
MYSUN/031	Synthesis of NiS/rGO CE catalyst prepared by hydrothermal method for QDSSCs.	Layla Haythoor Kharboot	Universiti Teknologi Malaysia	Alternative Energy
MYSUN/038	A Preliminary Study on Sustainability in Higher Education Institutions: Students' Attitudes and Perspectives	Chelsea Michcal	Universiti Malaysia Sarawak	Education for Sustainability
MYSUN/005	Re-purposing Second Life EV Batteries as Energy Storage System: Case Study	Mohammed Hussein Saleh Mohammed Haram	Multimedia University	Environmental Monitoring

MYSUN_ID02

SDG7: Solar PV Installations in Malaysian University Campuses

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Abstract: Solar energy has an increasingly important role to play in combatting the global threat of climate change and helping the nation to reach its greenhouse gas emissions target. The Feed-in-Tariff (FiT) Scheme was introduced by the Sustainable Energy Development authority (SEDA) under the Malaysian Renewable Energy Act 2011 to accelerate investment in renewable energy projects including solar PV installations. The Net Energy Metering (NEM) Scheme was launched for the new PV installations in November 2016 with quota allocation of 500 MW. Under the Net Energy Metering (NEM) 2.0 Scheme introduced in January 2019, followed by the NEM 3.0 in January 2021, consumers could benefit more from installing solar PV on their premises which allow the excess of the generated energy to be exported to the grid on a one-on-one offset basis. The Government is also encouraging electrical consumers to install solar PV to hedge against the rising cost of electricity. Large Scale Solar (LSS) Scheme and Self consumption (SelCo) were introduced in 2016 to offer large PV plants installations under the Energy Commission as the implementing agency. Several higher learning institutions have capitalized on the opportunity to install solar PV systems on their properties as their commitment towards achieving the sustainability goal in energy consumption and the economic benefits from the energy savings. The technical and economic assessment of several PV installations in Malaysian Universities are presented. This information could inspire other institutions to install solar PV system under the currently available NEM 3.0, or LSS Scheme, first to reduce their electricity bills and to contribute to the Nation's inspiration of the Net Carbon Zero target by 2050.

Keywords: Photovoltaic (PV) system; Net Energy Metering (NEM), Large Scale Solar (LSS), Malaysian Universities.

MYSUN_ID03

Conceptualizing Multi-dimensional model of Education for Sustainable Development (ESD)

**Alyani Ismail¹, Aduwati Sali², Nor Kamariah Noordin³, Nur Luqman Saleh⁴, Ahmad Zaharin Aris⁵, Fazirulhisyam Hashim⁶, Amir Zaqwan Yazid⁷*

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Abstract: In this presentation, we will share the conceptual implementation framework for Education for Sustainable Development (ESD), taking into consideration multi-dimensional approach covering knowledge, skills and behaviour that will drive attitude change towards sustainability. ESD refers to the overall educational goals including increasing the access to basic education, education for sustainable development orientation, increasing public awareness and understanding for all the sectors in the community. Therefore, integrating the principles, values and practices of sustainable development into all aspects of education and learning would demand for multidimensional framework of implementation. However, the implementation process of the education for sustainable development in Malaysia may need more structured implementation, rather than sporadic ways of embedding SDG elements in teaching and learning activities as well as campus living. Hence, based on the studies on current implementation of teaching and learning strategies for SDG in higher education, we formulated a conceptual framework that will promote various dimensions for ESD implementation. The framework consists of four dimensions of implementation namely academic competency, meaning creation, participation and social practices as pillars to designing learning activities, covering three main outcomes: Cognitive, motivational and socio-emotional. One of the key dimensions in this model is the society participation for learners to create personal significance and sense of belonging as an individual within a sustainable eco-system. It was shown in various teaching and learning settings that through this learning process in multiple-dimensions, changes in values and attitudes, skills and behaviour will be achieved, particularly through widespread and deep understanding of the issues of sustainable development. The framework is useful for educators to formulate teaching and learning activities to cover the dimensions as a more effective and well-planned implementation in ESD, particularly for higher education.

Keywords: Education for sustainable development, model, framework

MYSUN_ID05

Re-purposing Second Life EV Batteries as Energy Storage System: Case Study

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Abstract: It is estimated that by the year 2030, the cumulative of Electric Vehicles (EVs) will reach 85 million. Once EV batteries are degraded to 70- 80% of their initial capacity, EV owners will have to replace the EV batteries as the residual capacity becomes insufficient for automotive use. As a result, more batteries will be discarded from EVs. Such batteries could be re- purposed in other Energy Storage System (ESS) applications, where they are known as the EV Second Life Batteries (SLB). Different applications of SLB, assessment and testing required before re-purposing EV batteries are presented. Utilising SLB addresses not only an environmental concern with regard to discarded batteries but also provides an excellent opportunity to generate revenue. EV users, SLB re-purposing companies, ESS users, and recyclers are to benefit from such utilisation. As for EV users, they can get money back for their discarded batteries and ultimately pay less to buy EVs as most manufacturers include the cost of shipping the batteries back to the manufacturer in the initial price of the EV when it was new. Another business opportunity is created for those who will work on re-purposing SLB. The third major players are the ESS users. These users can buy SLB as ESS at a cheaper price as an alternative to using new batteries with proposedly governmental incentives for utilising SLB rather than new batteries. Lastly are the recyclers who cloud benefit from extracting materials from those batteries that have failed the assessment. In this project, Nissan Leaf 2012 leaf batteries have been put into testing. The batteries were assessed in accordance with the UL-1974 standard. Visual inspection, incoming Open Circuit Voltage (OCV) measurement, incoming high voltage insulation test and residual capacity test were carried out. It was found that the batteries were in good shape, with high voltage insulation (>200M ohm) and still had an average of 48% remaining capacity making them suitable for re-purposing. Then these batteries were implemented as an ESS for Solar-Powered Street Light in a residential area and an ESS for a Fixed Load Backup coupled with a Photovoltaic (PV) system in a university. In comparison to Lead Acid batteries, SLB offers a longer-lasting and cheaper 2 alternative by at least 15-20%. In comparison with New Lithium-ion batteries, SLB, despite their shorter life compared to new, are yet cheaper options considering their lower initial capital investment based on the presented case study that was implemented on real-life systems. Nevertheless, some challenges do exist, such as the lack of standardised assessment and automation in the industry. Furthermore, there are no government policies that regulate the utilisation of SLB. In addition, most EV retailers have signed contracts with manufacturers to send the batteries back to them once discarded causing to have fewer discarded batteries in specific regions.

Keywords: Second Life Batteries (SLB), Electric Vehicles Batteries (EVB); Energy Storage System

MYSUN_ID006

How resilience and social support strengthen the psychological well-being of inmates with life sentences

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Abstract: Many resilience studies focus on groups of subjects in organizations, people with serious illness, and individuals with acute stress. How is the resilience of a person with a strong stressful condition, such as a life sentence in prison? These questions are important to broaden the understanding of the theory of resilience and individual adaptation in a prison environment to keep having a good Psychological Well-Being. The study of the positive relationship between resilience, social support, and psychological well-being in the general group found significant conclusions. However, studies on this topic in special groups, such as life imprisonment, are still very limited. The Inmates with life sentences face more severe sources of psychological distress than other groups. The purpose of this study was to identify the relationship between resilience and social support with strengthening the psychological well-being of inmates with life sentences. This study examined 80 inmates with life sentences in Indonesia using The Connor-Davidson Resilience Scale (CD-RISC), the Social Provisions Scale (SPS), and the Ryff Psychological Well-Being Scale (RPWBS). The research findings conclude that the higher the resilience and social support, the better the psychological well-being conditions of inmates with life sentences. The implication of this study is to recommend a psychosocial development program for inmates with life sentences to prevent mental health disorders.

Keywords: resilience, social support, the psychological well-being, inmates with life sentences

MYSUN_ID009

How resilience and social support strengthen the psychological well-being of inmates with life sentences

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Universiti Utara Malaysia

Abstract: Malaysian higher education institutions (HEIs) have respectively developed their own programs and policies addressing sustainability issues such as energy, waste, transportation etc. Without a common framework to work on, these programs and policies vary greatly from one HEI to another; from those who have campuses that become reference centre for sustainability, to those who simply have basic guidelines to monitor energy usage in their buildings. Additionally, the implementation and monitoring are not centralised, but rather distributed among several different units or departments within the institution, at different hierarchical levels, with insufficient staff, and lacking of up-to-date and relevant training. It is pressing therefore to support the development of sustainability in HEI campuses in Malaysia, and even more so to do it through a national platform, in order to ensure that more concerted activities will have a better impact at both local and national levels. Interviews were conducted with eight public and private universities in Malaysia. Five main aspects, which are implementation of policies, motivation to sustain green initiative, campus sustainability design, initiatives made to increase awareness regarding green initiatives in campus, and financial limitation, are the focus of this study. For the key conclusion, it is concluded that Malaysian HEIs are still in an uncoordinated system for campus sustainability. There are also uncoordinated green initiatives among the HEIs, especially on the policies to align with SDGs. Few challenges and obstacles were recognised and highlighted as well as positive factors as way forward.

Keywords: Malaysian higher education institutions, sustainability initiatives, integrated system

Off-Grid Renewable Energy Transition in Selected Countries in Africa: Challenges and Opportunities for Sustainable Development

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Abstract: The intermittent supply of electricity in most developing nations has given rise to the adoption of off-grid renewable energy as the only viable option to gain access to reliable and affordable electricity. It is worthy of note that the socio-economic benefits of off-grid renewable energy are being felt across the continent especially in rural communities for street lights, water supply, etc. This paper analyses the exploitation of off-grid renewable energy transition in selected African countries with the challenges and the opportunities associated with the source for sustainable development. The required data were collected by undertaking some visits to rural communities, Additional data were also collected from the International Renewable Energy Agency (IRENA), the International Energy Agency (IEA), and more from relevant literature. However, as of December 2020, the total Off-grid renewable energy capacity in Africa was 1416.68 MW. The study shows that Off-grid renewable energy capacity in Africa is increasing rapidly over the past year with solar energy as the main source of growth, which amounts to 74% of the total Off-grid renewable capacity in Africa. Consequently, most households and small businesses complained about the huge initial cost of installing a renewable energy system, which makes some consumers adopt a wide range of lower-rating standalone solar products that can power fewer equipment/appliances, while the affluent maximise its usage in powering several types of equipment/appliances. Hence, its adoption will provide a broader range of global and national benefits in terms of reduced carbon dioxide emissions, less air pollution, diversification of energy supply, and most importantly will reduce the burden on the available grid-connected system.

Keywords: Africa; electricity; off-grid; solar; renewable energy; Sustainable development.

MYSUN_ID012

MySUN's White Paper: Energy in the Context of Sustainability at Higher Education Institutions

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Abstract: Malaysia Sustainable University Campus Network (MySUN) is a research and development network of eight (8) Malaysian universities and three (3) European universities, which commenced in 2020. The network projects capacity building on the eight Malaysian universities so that it may achieve its final aim of promoting its members as 'living laboratories' for sustainability and energy efficiency insofar to have a positive influence on Malaysia's National Energy Efficiency Action Plan that was launched in 2015. Yet in actuality, MySUN is platform for the development of an Innovation Ecosystem - the 7th Shift of Malaysia's Education Blueprint (2015-2025). Many activities such as discussions, seminars, workshops, and conferences have been carried out under MySUN' capacity building project in the past three (3) years. These activities were clustered as work packages. While the project has been somewhat successful with the development of sustainability offices at the respective universities and the rolling out of roundtable guidelines, network enlargement plans, and MOOC; it had uncover a few issues and challenges that higher education institutions (HEIs) faced in becoming appropriate living labs. These are associated with higher learning and research, campus resources and good practices, management system, and welfare matters, although these may extend outside higher education ecosystem into the energy management ecosystem. Along with the solutions to the challenges that have emerged though MySUN related experiences, a description is provided. The manuscript contains descriptions that is expected to feed into MySUN's white paper for presentation to the Malaysian Government.

Keywords: Living Lab; Malaysia's Education Blueprint (2015-2025).

MYSUN_ID013

The Theory of Planned Behaviour (TPB) Predictors Influencing Green Purchase intention

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Abstract: In recent decades, the greenhouse effect, excessive waste generation, pollution, global warming, increasing population, and species extinction have caused resource scarcity that increases level of environmental deterioration. This causes human concern for environmental sustainability has grown in tandem with recent economic development. Further, globalisation has changed environmental concerns, leading to a rigid green consumption trend. Thus, green purchase behaviour considered as major contributor to environmental sustainability and this paradigm shift of consumer's purchase preferences considered as crucial to minimise the negative impact on nature as the notion of environmental sustainability is now in forefront. In line with this, the frequent episodes of environmental catastrophic and desperate need to shift for sustainable lifestyle; green product purchase behaviour has received widespread attention from the academic community to derive predictors that explain consumer green purchase behaviour in various contexts. Green purchase behaviour expanded in developed nation and recently the concept also spreading rapidly in developing country such as Malaysia. Therefore, consumers in both developed and developing countries intend switch to green consumption by being concerned about the impact on the nature due to the household product that they have initiate to purchase. However, previous studies found customers in India are hesitating to select green apparels because they are expensive compare to traditional apparels and customers are also unaware of genuine benefit to the environment. Further, lack of information about environmental terminology, concept; consumer's education level, limited understanding of the particular source of issue and idea toward environmental sustainability identified as root cause for the negligence. Nevertheless, Malaysians attitude of entirely rely on government acts to shift society's perception and educate them for sustainable lifestyle is undeniable. Government alone unable to solve the problem without public support and individual initiatives to transform into sustainable practice. Thus, this study demonstrates green product purchase intention among higher education students in Malaysia. This study examined the relationship between environmental concern and marketing effectiveness influencing their green product purchase intention. Through a comprehensive literature review, the influencing factors of individual green purchase intention are organised into three categories: cognitive elements, consumer personal characteristics, and social aspects. All these factors are divided into those unique to the individual as a decision-maker and those considered situations in nature. Consumer environmental concern and product marketing effectiveness emerged as the two significant determinants of consumer green purchase intention. The paper provides details about the main predictors of consumers' green purchase intention. This study will help policymakers and managers formulate and implement strategies to encourage green purchasing behaviour. Further, the Theory of Planned Behaviour (TPB) is utilised to explain the relationship.

Keywords: Green product purchase intention, environmental concern, marketing effectiveness, Theory of Planned Behaviour (TPB), higher education students

MYSUN_ID014

STEM for All – From Sumo-Robots to Smart Bin

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Abstract: The Internet of Things (IoT) is a network of physical objects which is the things that embedded with sensors, software, and other technologies for connecting and sharing data with other devices and systems over the internet. IoT has quickly emerged as one of the most crucial technologies of the twenty-first century. As it can now link common objects to the internet via embedded electronics, allowing for seamless communication between people, processes, and things. Hardware components can exchange and gather data with little human interaction thanks to low-cost computers, the cloud, big data, analytics, and mobile technologies. In this hyperconnected environment, computerized systems can record, monitor, and adapt each interaction between connected devices. The physical and digital worlds collide, and it can work together. In this project, an IoT system is proposed, as a tool to teach school students the concept and application of IoT in real life. The demonstration modules on IoT and Arduino concepts were being created and developed for the students to learn the basics by using interesting activities such as mini car, sumo-robots and smart bin. This training module will provide and increasing their understandings on the STEM (Science, Technology, Engineering and Mathematics) concepts. At the end of the training, the trainers which are final year UPM students taking Engineers and Society course achieve technical and social skills from the IoT training and interactions with the community, specifically school students. This activity has increased STEM interests among the school students and hopefully they will further pursue their studies in STEM-related programs.

Keywords: STEM, engineers and society, IoT

MYSUN_ID015

**DFT: B3LYP/LAN2DZ Study for the Removal of Pb, Cd,
and Cu with Chitosan/alginate Composite Adsorbents.**

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Abstract: The possible interactions between selected divalent heavy metals; Pb, Cd, and Cu and chitosan-monomer (Csmonomer), chitosan-dimer (Csdimer), and chitosan/alginate (Cs/alg) were studied by density functional theory (DFT) at B3LYP level with a LANL2DZ basis set. The heavy metals under study have been selected because of their high impact on industrial wastewater. The interactions between the 3 D optimized structures of Csmonomer, Csdimer, Cs/alg, and the heavy metals have been investigated for the band gap energy, total dipole moment (TDM), and binding/adsorption energy. The proposed 3D models were applied to the study of the interaction between Cs-based materials and the heavy metals in comparison to both the effect of oxygen-containing groups on the surface of alg and the nitrogen-containing groups on the surface of Cs-based materials. The findings demonstrated that the interaction between the composite Cs/alg and hydrated metal established more selectivity for the metals than the non-composite Cs-based materials. And, consequently, the computational 3D optimized model structures evaluation results corroborated with the experimental results. Subsequently, these results obtained could be applied in the field of environmental pollution by removing the heavy metals from industrial wastewater

Keywords: Chitosan/alginate, Composite, DFT, LANL2DZ, Heavy metal, wastewater

MYSUN_ID017

The Influence of Ammonia Nitrogen Content in Landfill Leachate on Microbial Fuel Cell Performance: A Review

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Abstract: Microbial fuel cells (MFC) have emerged as a promising energy-harvesting technology in recent years which offer important economic benefits. This method employed environmental contaminants as a substrate, such as effluent from landfill leachate to recover energy and improve treatment efficiency. These contaminants pollute water bodies, harming aquatic life, raising treatment costs of plant, and emit harmful gases to deplete the ozone layer. Among several substrates, landfill leachate effluent is mostly employed to investigate the potentials of this technique. Although it contains an inhibiting factor called ammonia nitrogen compound (NH₃-N), which lowered the potential of power density as well as optimal treatment efficiency of the system. Although, little attention has been paid to the effect of ammonia concentration of landfill leachate effluent on system performance. The main drawback associated with this approach was the determination of the optimal concentration ratio of the ammonia compound for high power density potential. This article reviews prior findings on the influence and optimum concentration level of ammonia nitrogen concentration from landfill leachate in response to microbial effects and operating parameters that reduce treatment efficiency, and electrochemical performance of the MFC. Following this overview, this article explored the systematic review approach on recent technological advances in leachate treatment and power generation, current findings on the NH₃-N inhibition performance of MFC, potential energy recovery and responses to operating parameters. These are well tabulated and explained in detail. This also make the researchers to understand the influence of operational parameters and inhibiting factors of land fill leachate at its optimum dosage for MFC performance. This paper recommends the use of response surface methodology (design expert) to obtain different scenarios of testing the maximum inhibiting factor on MFC performance coupled with operational variables. Mathematical modelling should be in cooperated for data validation

Keywords: Microbial fuel cell, land fill leachate effluent, Ammonia nitrogen, Inhibition

MYSUN_ID018

Utilization of tailing ash as adsorbent for removal of Methylene Blue

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Abstract: Methylene blue is a widely used dye in the textile industry. The liquid waste contains toxic and dangerous ingredients which cannot be discharged directly into the natural environment without treatment. Adsorption process is among the most effective techniques to treat the waste, especially in removing coloring agent. The present paper is an attempt to remove the methylene blue from wastewater using adsorption over tailing ash obtained from the floatation process. The parameters studies are (pH, stirring speed, the initial dye concentration, contact time and adsorbent dosage). About 89.90% of the dye was recovered at the optimum condition (pH=10, initial adsorbent dosage = 1.5 g, 150 rpm, contact time=120 minutes, RT). The increase in adsorption contact time and adsorbate dosage will enhance the dye adsorption capacity (q_e , mg/g). The results indicated that the tailing ash was a suitable adsorbent for water quality improvement.

Keywords: Tailing ash; adsorption; dye.

MYSUN_ID019

Leveraging Mobile Augmented Reality Technology for Sustainable Technical Vocational Education and Training

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Abstract: There is a need for Technical and Vocational Education and Training (TVET) institutions to be sensitive to the rapidly evolving technology and workplace demands. This is significant because, throughout the region, there is a large gap between existing skills that may soon become obsolete and those desperately needing the digital and green economies to thrive. Based on the results of a preliminary investigation, it was determined that trainees' overall comprehension of the microcontroller module is the lowest. During the interview session, the trainers validated this result and stated that they require a substitute pedagogical approach. The concept of Augmented Reality (AR) is highly compatible with sustainable environmental practices. The main aim of this study is to determine the views of trainees regarding Augmented Reality content developed for the microcontroller module. This study proposed mobile Augmented Reality for TVET (mART) which is a learning platform that is in line with the current technological acceleration to examine the engagement level of TVET trainees. The research participants were 37 trainees from a TVET institution. The mART application can be used by downloading the app and then scanning the required QR code. Avoiding excessive use of electronic components for training purposes had a major impact on pollution levels and helps to save the planet in the long run. Since this study adopted a qualitative approach to collecting data, the researchers designed and deployed semi-structured interview questionnaires for the trainees while conducting the interviews. The trainees reported the positive effects of AR practices on improving the understanding of the microcontroller module. This application offers an interactive introduction, gamified circuit assembly training, and evaluation with a star rating. This application contributes to in-class engagement during training sessions. This study's findings suggest that, incorporating AR technology into TVET improves trainees' performance. According to 97.4% of the trainees, the mART application makes learning more enjoyable by encouraging a higher level of engagement. The repeatability options in Augmented Reality help to improve trainees' understanding of mistakes and iterations are made possible. The mART application doesn't require the physical presence of the components as it is able to deliver an augmented-real experience, which reduces carbon footprint and has long-term impacts. In order to produce a competent workforce that is prepared for employability, it is important that digitalization and reshaping of the TVET system incorporate green technologies such as Augmented Reality in their teaching and learning. The utilization of a wide variety of technology and materials has become increasingly important for promoting sustainability in TVET. The virtual learning environment, which encompasses Augmented Reality and Virtual Reality, is a viable platform

for training and education, particularly in the TVET context.

Keywords: Augmented Reality, Technical Vocational Education and Training (TVET), Sustainability in TVET, Technology-enhanced Learning, mobile Augmented Reality.

MYSUN_ID021

Awareness and Knowledge of Green Technology Among Youth in Malaysia

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Abstract: Green technology is an environmental technology that mainly contributes to minimizing the negative impacts on the environment. Adopting green technology is an important way to transform the current environment-unfriendly development model into sustainable development, especially in the context of the devastated ecosystem and depleted resources. Green technology helps to address the requirements of human beings in a never-ending way without destroying the environment or exhausting natural resources. Hence, increasing awareness and knowledge of green technology is important for protecting the environment by minimizing the environmental impact and consumption of natural resources on the earth. Many studies have been conducted pertaining to green technology, but it remains unclear when it comes to the awareness and knowledge of the youth in Malaysia. Therefore, the purpose of this study is to investigate the level of awareness and knowledge regarding green technology among Malaysian youth. Data was collected through online survey questionnaires consisting of respondents from Malaysian youth with the age between 18 to 24 years old and minimum tertiary education. A total of 200 responses were received and analyzed by using the Statistical Package for Social Sciences (SPSS) software version 26. The study shows that the majority of the respondents indicate that they had a relatively high level of awareness and knowledge of green technology, however 85% of the respondents are aware that they need to enhance their knowledge of green technology. Most of the respondents know the importance of green technology to the environment, but more than 50% of respondents know less about the type and main components of green technology. Although the government has initiated green technology development, most of the respondents were not aware of it and only about 48% knew about the implementation of the green technology campaign. The finding of this study is useful, beneficial to society, and attempts to help both practitioners and academics who would like to have a deeper understanding of the extent of Malaysian youth's awareness and knowledge of green technology, as well as assist them in identifying areas that need further improvement. This research will provide useful insight for governments and appropriate organizations to formulate various initiatives to increase the knowledge and awareness of young people to participate in the sustainable development of Malaysia. It is suggested that the government should promote the development and application of green technology among youth to improve the sustainable development of Malaysia. All levels of education should take significant responsibility for providing students with knowledge of green technology, including incorporating green technology materials in the curriculum of each study program, so that they can know how to use and innovate sustainable environmental protection technologies.

Keyword: Green technology, Awareness, Knowledge, Malaysia, Youth

Review on the capability of bio composite-based material for thermal insulation application

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Abstract: Today, energy savings are becoming crucial due to climate change. It is observed that there is increasing interest in thermal insulation systems and technologies for industrial equipment and other engineering applications, i.e., the HVAC system as well as the storage and cooling of food. It is known that thermal insulation is one of the important criteria for improving the efficiency of energy consumption. As of now, there are several materials that are used as insulators, such as foam rubber, rock wool, polystyrene foam, and polyethylene foam, because of their low price, ease of installation, and good insulating ability. On the other hand, biocomposite has emerged as one of the promising materials that offers good mechanical properties, lightweight, and also has good insulating properties, such as low thermal conductivity. Under thermal insulation, the thermal conductivity coefficient is one of the main focuses, where it is utilised to see the performance of the material react when there is a flow of heat. This study reviews and analyses the potential use of the biocomposite material for thermal insulation applications.

Keywords: Biocomposite; natural fibre; thermal properties; thermal conductivity.

MYSUN_ID024

Effect of GSM Base Stations on Residential Property Values in Bida, Nigeria

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Abstract: The un-regulated siting of Global System for Mobile Communications (GSM) communication towers had increased the exposure of a great percentage of the population to electromagnetic radiation and health hazard in developing countries. The study to examine the impact of GSM base stations on residential property values. The entire GSM base stations in the study area were sampled, where 201 questionnaires were administered to residential rental properties within 300m radius from the GSM base stations. Data collected were analyzed using both descriptive statistics and linear regression to model. The linear regression model was used in analysing the effect of GSM base stations on residential property rental values in the study area. It was found out that there is a significant impact of GSM base stations on residential rental values and therefore, the residential property values increase with increasing distance away from the GSM base stations and decreases decreasing distance away from the GSM base stations. It was recommended amongst others that unbiased public awareness should be made relating to the negative effects of residing in close proximity to GSM base stations. Also, residential property investors should avoid developing properties within 200m proximity to the GSM base stations.

Keywords: Global System for Mobile Communications (GSM); residential property; rental value; proximity; base stations.

**Does Corporate Aggressive Business Decisions Reduce
Energy Efficiency? The Moderating Role of Firms' ESG**

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Abstract: While the world keeps struggling to cope with the issue of climate change, promoting energy efficiency has been one of the top priorities for companies globally to conduct. Despite of certain factors affecting energy efficiency, this study is proposed to assess another perspective of relationship between risk-taking and energy efficiency at firm-level. By focusing on shareholders' well-being, this study argues that companies taking risky projects may engage less in energy efficiency investment. Therefore, this study intends to assess if corporate aggressive business decisions will likely reduce energy efficiency. In addition, this study examines the role of firms' ESG in moderating the relationship between risk-taking and energy efficiency. Public listed companies from developing countries, based on ASSET4ESG in the Datastream, are the research sample in this study. The data sample is panel data and the sample period starts from year 2007 to 2019. By using the multiple regression analysis for panel data, the results of this study expect negative relationship between risk-taking and energy efficiency, in which firms' ESG is expected to negatively moderate the relationship. This study is limited to the countries, time periods, and other risk-taking variables that are not included in the research.

Keywords: Risk-taking; Energy Efficiency; Firms' ESG.

MYSUN_ID028

Factors Influencing Education: Insights for Impactful Sustainability Educations Programs

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Abstract: Academic performance is evaluated by continuous assessment or cumulative grade point average and indicates how effectively a student, lecturer, or institution has met their short- or long-term educational goals (CGPA). However, acquiring knowledge, attitudes, values, and skills through education is not an easy task; it is rather a long and difficult journey through life. According to cross-sectional analysis, an increasing percentage of students still fail to graduate from higher education institutions in Malaysia, which may indicate that they did not do well in their coursework. Therefore, there are found some factors that influencing student academic performance in higher education institutions which are financial stress, increasing of academic enrolment, teaching environment etc. Universities shall provide scholarship itself to student who is getting a good result in secondary to solve their financial stress and arrange a suitable timetable for student to ensure student will not have many subjects taking in the semester. Universities shall also ensure the teaching environment is comfortable for student to make sure student can fully focus on class when lecturer giving lecture and knowledge to student.

Keywords: Sustainability, Education, Education

MYSUN_ID029

Presence of a sustainable virtual reality application for assembly tasks in engineering education

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Abstract: A virtual reality (VR) application is a simulated system using computer-generated objects. VR is a very effective tool in the application of many sectors such as medicine, tourism, industry, education, training, and many others. The complexity of the practical activity, especially in the assembly department shows that one of the challenging tasks was to assemble an automobile engine using the current method, which relies heavily on video-based supervision. Therefore, this research emphasises developing a sustainable fully immersive VR application for engine assembly. VR application using Unreal Engine software was developed with the use of HTC Vive device. Fourteen students from engineering education participated in the sustainable virtual assembly experiment. They were then requested to fill out the Witmer-Singer Presence Questionnaire in order to test the virtual presence of the VR application at the end of the experiment. The reliability of the collected data was analysed using the Cronbach alpha test. The results showed that the VR application provided an excellent and highest precision of presence in the assembly tasks. In addition, students prefer the sustainable fully immersive VR application to perform the engine assembly.

Keywords: Sustainable fully immersion; virtual reality; engine assembly; Witmer-Singer Presence Questionnaire; Cronbach alpha test.

MYSUN_ID031

Synthesis of NiS/rGO CE catalyst prepared by hydrothermal method for QDSSCs.

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Abstract: –Solar energy is one of the most important alternative energy due to its abundance. The development of electrocatalytic counter electrode (CE) materials for quantum dots sensitized solar cells (QDSSCs), is driven mainly by overcoming the disadvantages of precious metals, by being replaced by transition metal sulfides (TMS) which are forcefully considered emerging candidates for their unique physical and chemical properties. Owing to their non-precious, excellent electrochemical activity as well as stability, and integration with conductive graphene hosts have enabled the significant improvement of the electrochemical performance of devices are among the materials studied for energy generation applications. Nickel Sulfide (NiS) anchored reduced graphene oxide (rGO) nanocomposites (NiS/rGO nanocomposites) were synthesized using hydrothermal methods at 150°C for different deposition times (5hrs, 10hrs, and 15hrs), then deposited these 2 three samples on fluorine-doped tin oxide (FTO) substrates using doctor blade method and served as counter electrode for QDSSCs. NiS/rGO was characterized before and after deposited on FTO substrate using the X-Ray Photoelectron Spectroscopy (XPS), X-ray diffraction (XRD), elemental analyzer vario micro (EAVM)/(CHNS analysis), field emission scanning electron microscope (FESEM) and X-ray spectroscopy (EDS). The XRD results showed that the synthesized NiS/rGO nanocomposite at different deposition times (5hrs, 10hrs, and 15hrs), have crystalline structures of α -NiS, β -NiS, and rGO for both before and after being deposited onto the FTO substrate. The FESEM and EDS results showed that the individual spherical-like the structure of NiS with homogeneous sizes in the range of 250-300 nm are uniformly distributed throughout the rGO sheet and evolved to nanoflakes-like structures of NiS/rGO after being deposited on the FTO substrate at 450°C for 10 minutes. These results approved that the deposition time influenced the size and surface morphology of the nanocomposites. The nanoflakes structures of NiS/rGO/FTO at different deposition times (5hrs, 10hrs, and 15hrs), provide a high surface-to-volume ratio leading to the high electrocatalytic activity of CE materials that improve the PV performance of QDSSCs. This effort is believed can widen the option to one of our global sustainable development goals, which is affordable and clean energy.

Keywords: Quantum dots sensitized solar cells (QDSSCs); Nickel sulfide; reduced graphene oxide (rGO); counter electrode (CE); fluorine-doped tin oxide (FTO); X-Ray Photoelectron Spectroscopy (XPS); X-ray diffraction (XRD); elemental analyzer vario micro (EAVM)/(CHNS analysis); field emission scanning electron microscope (FESEM); X-ray spectroscopy (EDS).

MYSUN_ID032

Emotion Recognition System (ERS): A Technological Effect from Pollution and Environmental Degradation

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Abstract: Environmental degradation occurs when the earth's natural resources are depleted and compromised with the form of pollution in the water, air and soil. Pollution has become a serious issue due to the cause of pollution affecting health and safety, and increasing potential diseases. Furthermore, pollution has led to environmental degradation which is one of the largest threats that are being looked at in the world today. The main effects of environmental degradation from pollution have impacted the lifestyle and the future. Protective gear such as face masks, shields, etc, are becoming a necessity in order for us to cope with pollution and environmental ruin. With the recent Covid-19 Pandemic and the threats of variants, society's awareness and adoption of personal protective equipment have significantly increased. This creates restrictions and challenges in ensuring effective communication. Thus, there is a need for innovative solutions to overcome this issue. In recent years, there is an important area of technological development, namely, the application of artificial intelligence (AI) to recognize human emotional states. Emotion recognition system (ERS) is a part of artificial intelligence and machine learning that enables computers, robots, and machines to evaluate human emotions through our behaviour and conditions. The emergence of ERS can be attributed to its potential applications in various platforms, sectors, and purposes. ERS can be achieved through several modalities that have been suggested and developed by previous ERS researchers and practitioners. Either through physiological, physical and data mining, the results of these modalities have shown that ERS can be enabled and provide some solutions towards industries and societies. In a time when more of us are protecting ourselves by covering up, ERS can be a solution to overcome communication challenges. Furthermore, as the world promotes technologies such as smart manufacturing, smart homes and smart cars, in order to conserve natural resources, increase sustainability as well as reduce environmental degradation, embedding ERS into these technological innovations will lead to better human-computer interface and thus promotes higher adoption. Therefore, it is suggested that there is a need to understand ERS and the factors that affect the adoption of ERS better. Furthermore, it is also important to study the dynamics of the ERS research landscape in Malaysia to promote the creation of homegrown solutions that can tackle current needs and ensure a better future.

Keywords: Emotion recognition system (ERS); artificial intelligence (AI); environmental degradation;

MYSUN_ID033

Estimation of the Carbon Storage and Sequestration Potential of Urban Wayside Landscape Trees in Abuja City, Nigeria.

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Abstract: The greenhouse effect of climate change can leverage carbon sequestration to capture its compounds from the environment through the soil. There has been a gap in the literature and empirical studies in proffering strategies for estimating carbon storage and sequestration in an Urban City. This paper further makes a case for Abuja City to make an estimation of the process of reducing the impact of the greenhouse effect by leveraging on tree inventory and carbon sequestration potential measurement of existing trees through artificial intelligence (remotely-sensed data). The research developed a protocol to quantify aboveground carbon (C) storage and sequestration using samples of urban wayside/street trees across the five districts in Abuja city. Twenty (20) trees were sampled in which the tree species, family, frequency of sequestration, and the quantity of CO₂ sequestered during its lifetime were considered. It was further concluded that estimating carbon storage can shape future city greening plans, and act as a baseline for future assessments of the city's carbon sink. Additionally, it also identified and emphasized that efforts should be enhanced to sustainably manage the landscape through restoration practices to reduce emissions associated with degradation and enhance carbon storage potential. The research highly recommends that continuous monitoring of carbon stock is also important to estimate net carbon storage and sequestration.

Keywords: Estimation; Carbon Sequestration; Carbon Storage; Landscape Trees; Urban, Wayside, Nigeria

**Potentials of Harvesting Daylight at the College of Engineering Complex Najran
University Saudi Arabia.**

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Abstract: Daylight systems collect natural light and deliver it deep into the heart of buildings. The quality of this natural light tends to be alive and vibrant, and diffusers can be placed strategically to allow the best distribution of light within the interior. Many studies have shown that light has a significant impact on humans in a variety of contexts, the impacts of natural light on building occupants should be a key factor in building design. The use of artificial light can be reduced to lower the energy consumption of a commercial facility. Government policy and legislation such as the Climate Change Act, Carbon Plan, Infrastructure Act, Building Regulations, and Construction 2025 mean that the construction industry needs to find ways to reduce the energy consumption of buildings. 'Natural' daylight systems may be one way of contributing to these reductions in carbon emissions. This is also in line with Saudi Arabia's vision 2030. Any decreases in the amount of power used for lighting and cooling can ultimately have a negative impact on the environment due to the current heavy reliance on fossil fuels for electricity generation. This study investigates the potential of harvesting daylight in the college of engineering at Najran University. The study employs a literature review and observation of the college of the engineering building at Najran University. The study shows that so much daylight could be harvested in the building complex from the four main types of daylighting systems; Tubular daylight devices, vertical systems, horizontal systems, and fibre optical devices; if an ideal green retrofitting is carried out. The fibre optics daylight system seems to be more appropriate because it involves a minimal retrofitting procedure to be carried out. This study calls for the Najran University management to consider a retrofit that would enhance daylight harvesting, which will in turn reduce the amount spent on energy and at the same time reduce possible carbon dioxide emissions as a result of the use of energy from the use of fossil fuel.

Keywords: Potentials; Harvesting; Daylight; Najran; University; Saudi-Arabia.

MYSUN_ID037

**A Blue Ocean Shift for University Sustainability
Sustainable Aquatic Resource Management in Mangrove Ecosystem via Internet of
Things Application (MEITA)**

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Abstract: Growing financial insecurity and demand for future-ready graduates and academicians have encouraged universities across the world to redesign their programs, curricula and business models. The ultimate role of a university is to bring the best out of humankind by emancipating and empowering them with knowledge and skills that benefits the community and society. In driving a university from good to great, it is vital for it to clearly differentiate the university's uniqueness and strengths. This lecture highlights the experience of University Teknologi Malaysia (UTM) in creating a Blue Ocean Shift as one of the leading institutions in Engineering Education and Research for Sustainable Development. We utilise the "Six P" key drivers of building a university that champions energy sustainability. The top priority is given to the development of People who embrace the higher Purpose of a university's existence. Blue Ocean Programs (innovation) and quality provide a university with the much-needed competitive edge whereas Partnership will enable stakeholders to fulfil the collective social responsibility for universal well-being. Universities are also expected to ensure that the Physical Facility and ecosystem are of acceptable standards, and to deliver high Performance in order to fulfil an institution's brand promise and sustain its core business.

Keywords: Blue Ocean Shift, University Sustainability; Future-Ready Graduates; Engineering Education, Sustainable Development; People-Purpose-Program-Partnership-Place-Performance.

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A Preliminary Study on Sustainability in Higher Education Institutions: Students' Attitudes and Perspectives

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Abstract: Within the recent decades, there has been an emerging trend in higher education institutions (HEIs) as curriculum and administration seek to incorporate the goals of sustainability and development. In Malaysia, many campus-based initiatives that seek to forward sustainable development goals also took off. However, students' involvement in these initiatives is understudied despite the students being the largest demographic in the university's population. This paper aims to explore the extent of a public or private university student's knowledge of sustainable development and the United Nations Sustainable Development Goals (UN SDGs). The study's objective is to analyse the outcome of the perceived knowledge on sustainability towards student behaviour. It also examines how students can contribute towards sustainable development efforts given their current challenges and obstacles. This research used a qualitative method to evaluate students' attitudes and perspectives on sustainability in prominent public (Universiti Malaysia Sarawak) and private (Swinburne University of Technology Sarawak) universities in Kuching, Sarawak. In-depth interviews were held with students from both universities. The selected interviewees consisted of student leaders with the authority to speak on the issue and behalf of their peers. Students' knowledge and the ability to transform the knowledge into practice are the focal concern of the in-depth interview. The interview result showed that students are generally aware of the concept of sustainable development and its contemporary issues. They also articulated the inclusion of the UNSDGs in their campus life, such as in their curricular or extracurricular activities. However, there were differing opinions on the adequacy of sustainable behaviours and the ongoing efforts to address sustainability issues.

Keywords: sustainable development, UNSDGs, higher education institutions, student behaviour, student leaders



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