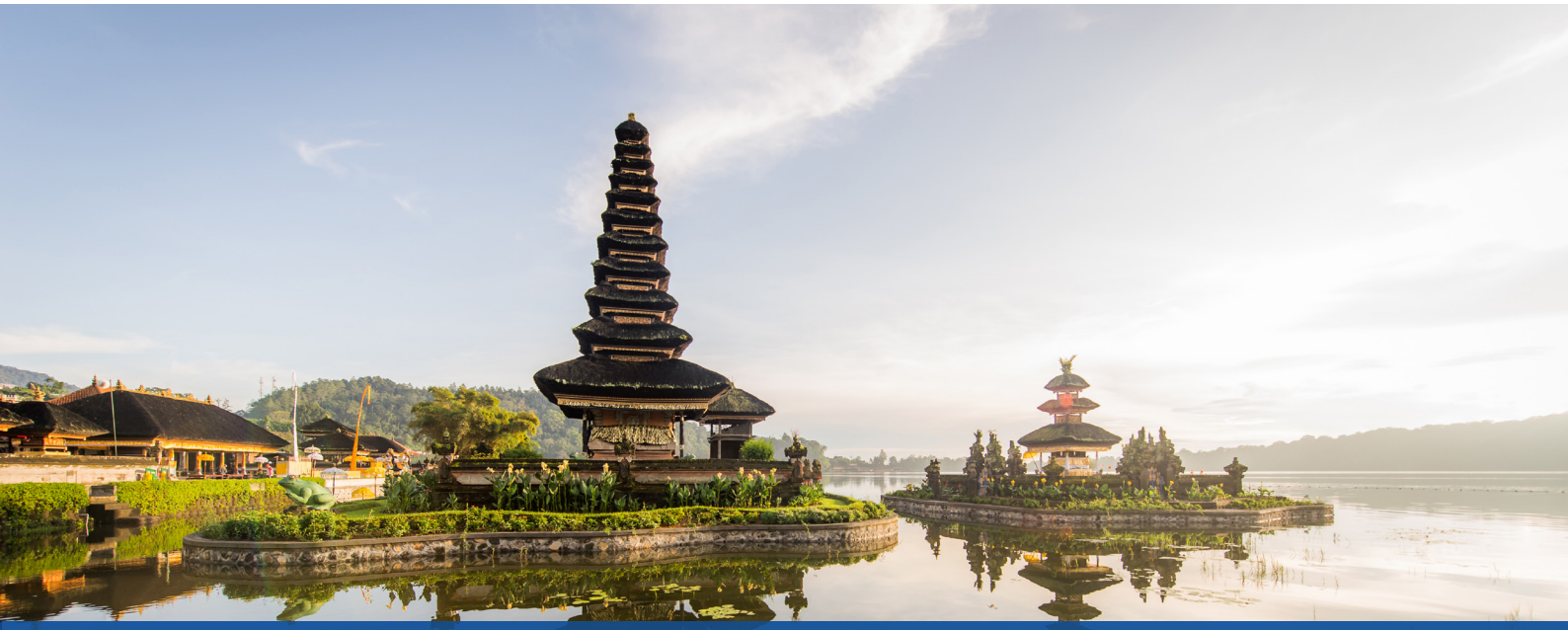
ICASETM
21-22 Aug 2025 | Jakarta, Indonesia

ICASETM 2025



8th International Conference on
Applied Sciences, Engineering, Technology and Management

21st–22nd August, 2025 **Jakarta, Indonesia**

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ICASETM
21-22 Aug 2025 | Jakarta, Indonesia

8th International Conference on Applied Sciences, Engineering, Technology and Management (ICASETM-2025), Jakarta, Indonesia

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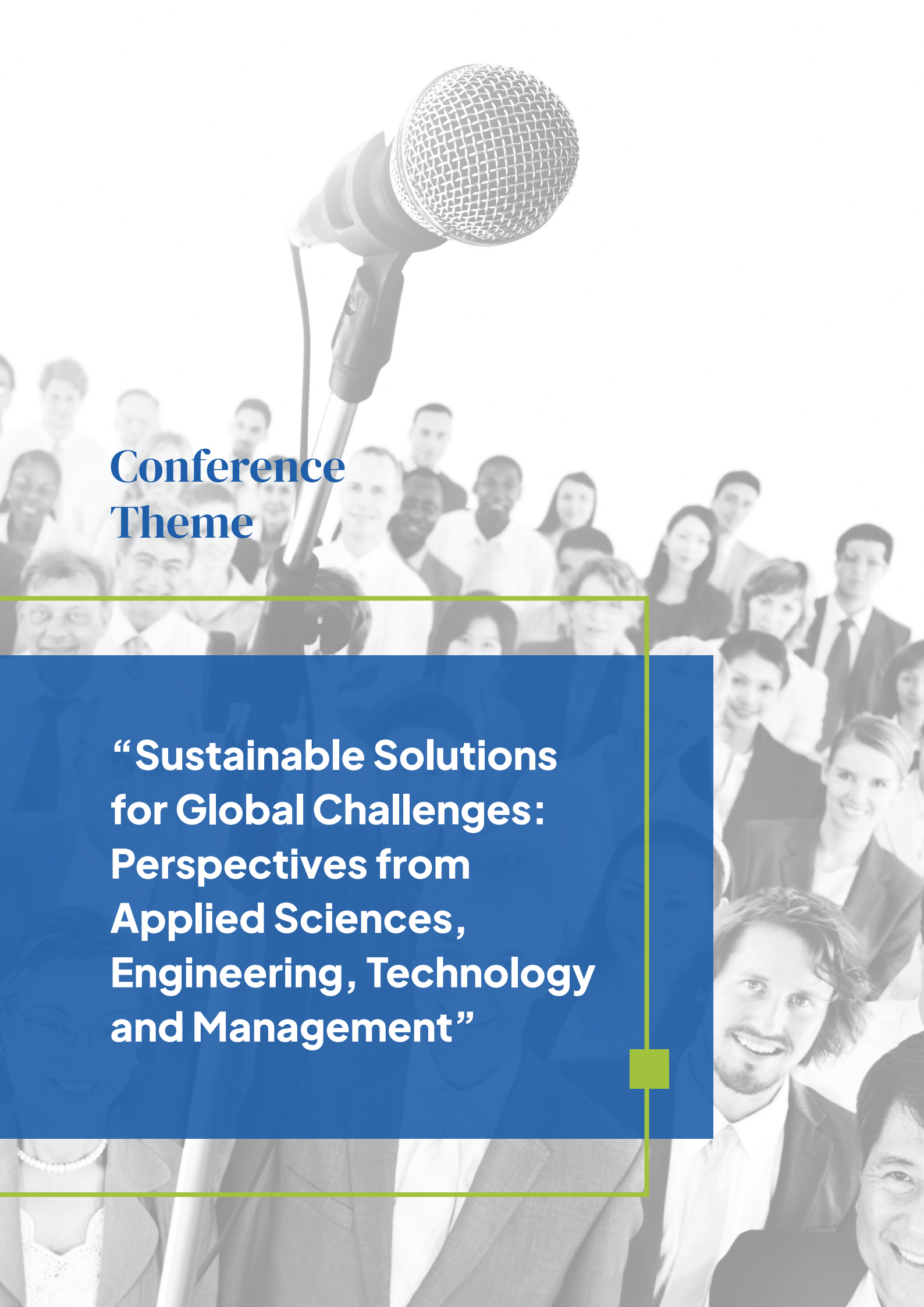

Conference Theme

“Sustainable Solutions for Global Challenges: Perspectives from Applied Sciences, Engineering, Technology and Management”

Preface

We are delighted to extend a warm welcome to all participants attending 8th International Conference on Applied Sciences, Engineering, Technology and Management (ICASETM-2025), taking place in Jakarta, Indonesia on 21st & 22nd August, 2025. This conference provides a vital platform for researchers, students, academicians, and industry professionals from all over the world to share their latest research results and development activities in the field of Science, Engineering, Technology, and Management. It offers delegates an opportunity to exchange new ideas and experiences, establish business or research relationships, and explore global collaborations.

The proceedings for ICASETM-2025 contain the most up-to-date, comprehensive, and globally relevant knowledge in the field of Science, Engineering, Technology, and Management. All submitted papers were subject to rigorous peer-reviewing by 2–4 expert referees, and the papers included in these proceedings have been selected for their quality and relevance to the conference. We are confident that these proceedings will not only provide readers with a broad overview of the latest research results in Sciences, Engineering, Technology and Management but also serve as a valuable sussssmmary and reference for further research in these fields.

We are grateful for the support of many universities and research institutes, whose contributions were vital to the success of this conference. We extend our sincerest gratitude and highest respect to the many professors who played an important role in the review process, providing valuable feedback and suggestions to authors to improve their work. We also extend our appreciation to the external reviewers for providing additional support in the review process and to the authors for contributing their research results to the ICASETM-2025.

Since May 2025, the Organizing Committees have received more than 150+ manuscript papers, covering all aspects of ICASETM-2025. After review, approximately 75+ papers were selected for inclusion in the proceedings of ICASETM-2025. We would like to thank all participants at the conference for their significant contribution to its success.

We express our gratitude to the keynote and individual speakers and all participating authors for their dedication and hard work. We also sincerely appreciate the efforts of the technical program committee and all reviewers, whose contributions made this conference possible. Finally, we extend our thanks to all the referees for their constructive comments on all papers, and we express our deepest gratitude to the organizing committee for their tireless work in making this conference a reality.

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About ICASETM 2025

The 8th International Conference on Applied Sciences, Engineering, Technology and Management (ICASETM-2025) stands as a prominent gathering scheduled for 21st and 22nd of August 2025 in Jakarta, Indonesia. This conference serves as a nexus for academics, researchers, and educators worldwide, fostering the exchange of pioneering research and innovative methodologies across diverse educational spheres. ICASETM-2025 aims to facilitate collaborative discussions, address contemporary educational challenges, and explore emerging trends to drive transformative changes in education. With an emphasis on practical applications and impactful insights, this event endeavors to shape the future of teaching practices and educational policies on a global scale.

The theme "Sustainable Solutions for Global Challenges: Perspectives from Applied Sciences, Engineering, Technology, and Management" encapsulates the core focus of the ICASETM-2025. Through a cross-disciplinary lens, the event will delve into pressing challenges facing education today while seeking innovative, multifaceted solutions. ICASETM-2025 endeavors to foster insightful discussions and research collaborations that transcend traditional boundaries, paving the way for transformative approaches to address complex educational issues across diverse disciplines.

Purpose of the Conference

ICASETM-2025 aims to be an excellent conference to discuss the current progress and modern advances in the various fields of Engineering, Technology, and Management. It provides a platform for scholars, scientists, engineers, and students from universities and industries all over the world to present ongoing research to promote sustainable growth. Attending this conference would help you to sharpen your skills and refine your ideas using novel approaches by meeting with peers and contemporaries.

- Access To Expertise
- Stimulates Out-Of-The-Box Thinking
- Formal Division of Labour

Objective of the Conference

The primary objective of ICASETM-2025 is to provide an engaging platform and immersive learning experience to engineers to help shape the future of the fields of applied science, technology, and engineering. We aim to promote the research throughout the network at the international level. This engineering conference will cover a wide range of topics in the fields of science, technology, and engineering for sustainable growth.

- Collaboration Reduces the Isolation of Researchers
- Transfer of Knowledge & Skills
- Increased Visibility of Work

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About IFERP Academy

IFERP Academy stands at the forefront of promoting innovation, collaboration, and knowledge dissemination in the fields of engineering, science, technology and more. As a professional association, IFERP is dedicated to advancing the academic and industrial landscape through various initiatives.

At its core, IFERP drives change and progress through various initiatives designed to foster cross-disciplinary exchange, empower researchers and professionals, and thus contribute significantly to the evolution of these fields. Through strategic partnerships, conferences, workshops, and publications, IFERP continues to shape a future where cutting-edge ideas, collaborative endeavors, and insightful knowledge flourish.

What We Do?

- We encourage convenient access to academic resources and support for all the aspirants and research scholors in urban and rural areas.
- IFERP Academy organizes public education programmes, Workshops, Conferences, Webinars, Seminars, Guest Lectures, Short Term Training Programme, Faculty Development programme in the field of Engineering, Science & Technology.
- IFERP Academy is dedicated to inquisitiveness, innovations and recent trends and developments in the field of Engineering & Technology.
- IFERP Academy believes in knowledge sharing by collaborating with other Universities, organizations/Associations, to bring a better tomorrow.

Mission

Upskilling the knowledge hub through technological innovation and excellence for the benefit of humanity.

Vision

A digitally equipped robust, dynamic & swift professional community integrating academics & industry for upgraded technical knowledge implementation.

Value

IFERP values the restoration of highlevel technological research, learning, collaboration, resource sharing & community-building traditions.

Goal

To serve as the foundation for all technological progress and advancement activities around the world.

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From the Director, IFERP

Mr. Siddth Kumar Chhajer

MD & Founder,
IFERP, Technoarete Group

On behalf of IFERP & the organizing Committee, I express my hearty gratitude to the Participants, Keynote Speakers, Delegates, Reviewers and Researchers.

The goal of the 8th International Conference on Applied Sciences, Engineering, Technology and Management (ICASETM-2025) is to provide knowledge enrichment and innovative technical exchange between international researchers or scholars and practitioners from the academia and industries in the field of Sciences, Engineering, Technology and Management.

This conference creates solutions in different ways and to share innovative ideas in the field of Sciences, Engineering, Technology and Management. ICASETM-2025 provides a world class stage to the Researchers, Professionals, Scientists, Academicians and Students to engage in very challenging conversations, assess the current body of research and determine knowledge and capability gaps.

ICASETM-2025 will explore the new horizons of innovations from distinguished Researchers, Scientists and Eminent Authors in academia and industry working for the advancements in Sciences, Engineering, Technology and Management from all over the world. ICASETM-2025 hopes to set the perfect platform for participants to establish careers as successful and globally renowned specialists in the relevant fields.

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From the Chief Executive, IFERP

Mr. Rudra Bhanu Satpathy

CEO & Founder,
IFERP, Technoarete Group

IFERP Academy is hosting the 8th International Conference on Applied Sciences, Engineering, Technology and Management (ICASETM-2025) this year in month of August, 2025. The main objective of ICASETM-2025 is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions. The sessions serve as an excellent opportunity to soak up information from widely respected experts.

Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and become known as a thought leader. I express my hearty gratitude to all my Colleagues, Staffs, Professors, Reviewers and Members of Organizing Committee for their hearty and dedicated support to make this conference successful. I am also thankful to all our delegates for their pain staking effort to make this conference successful.

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From the Principal, BFCET

Dr. Jyoti Bansal

Principal, Baba Farid College of Engineering & Technology, Baba Farid Group of Institutions, Bathinda, Punjab, India

Good morning to all distinguished delegates, researchers, academicians, and esteemed guests.

It is an honour and privilege to warmly welcome you all to the 8th International Conference on Applied Science, Engineering, Technology & Management (ICASETM-2025) here in the vibrant and culturally rich land of Indonesia.

This conference stands as a testament to the power of global collaboration, bringing together brilliant minds from diverse disciplines to explore, exchange, and elevate ideas that shape our rapidly evolving world. In an age where innovation knows no boundaries, platforms like ICASETM serve as a crucial bridge between research, industry, and real-world application.

As Principal of Baba Farid College of Engineering & Technology, India, I am proud to witness such an inspiring confluence of thought leadership and academic excellence. Let us use this opportunity not only to share our knowledge but also to foster partnerships that drive impactful change.

I extend my heartfelt gratitude to the organizers, speakers, and participants for your presence and contributions. May this conference spark new ideas, foster innovation, and strengthen our shared commitment to progress.

Wishing everyone a successful and enriching conference experience. Thank you!

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Exclusive Speakers

Tek-Yew Lew is an Associate Professor in Management at Curtin University Malaysia. He taught units related to management and marketing. Since 2008, He specialized in teaching units related to human resource management (HRM), organizational behavior, international management and principles of management at the undergraduate level. For the postgraduate MBA level, he teach the Human Resource Strategies 660 unit. In research, his area of focus is the employee and employer relationships specifically on the relationships between HRM practices, perceived organization support and employee attitudes and behaviors. He have published more than 30 articles in international refereed journals and conference proceedings. He was currently supervising five PhD students and Masters of Project Management students.

Dr. Tek-Yew Lew

Associate Professor,
Department of Management,
Curtin University, Malaysia

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Keynote Speaker

Dr. T. Somanathan

Department of Chemistry, School of Basic Sciences, Vels Institute of Science, Technology and Advanced Studies (VISTAS), Chennai, India

Dr. T. Somanathan, M.Sc., Ph.D., FSASS, is a Professor of Chemistry at the School of Basic Sciences, VISTAS (Vels Institute of Science, Technology & Advanced Studies), Chennai, India. He is an accomplished researcher in nanotechnology, carbon nanotubes, graphene, heterogeneous catalysis, and mesoporous materials, with applications in biosensors, photovoltaics, and drug adsorption. Dr. Somanathan holds a Ph.D. in Chemistry from Anna University, Chennai (2009) and completed his postdoctoral research at CEA/LITEN, France (2009–2010), specializing in nanomaterials for energy applications. His academic career has progressed through key positions at VISTAS, where he has served as Assistant Professor (2011–2015), Associate Professor (2015–2022), and Professor (2023–present). A leading scientist in nanomaterials, Dr. Somanathan has successfully led major research projects, including a DST-SERB-funded project on fabricating a novel biosensing system using supergrowth vertical-aligned single-walled carbon nanotubes with a ₹20.00 lakh grant. His guidance has resulted in the successful completion of 8 Ph.D. and 27 M.Phil. theses, with multiple ongoing research projects. His prolific research output includes numerous publications in high-impact SCOPUS and Web of Science-indexed journals, patents, and international conference presentations. He has been recognized with several prestigious awards, such as the Dr. APJ Abdul Kalam Award for Scientific Excellence (2022), Sci-Edu Award for Excellence in Chemistry (2025), and multiple Faculty Excellence Awards. Dr. Somanathan is also an editorial board member and reviewer for renowned scientific journals and holds memberships in professional organizations like the Indian Carbon Society and the International Association of Engineers. His Google Scholar, Scopus, and Vidwan profiles offer deeper insights into his research and contributions to the field of chemistry.

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Keynote Speaker

Ts. Gs. Ir. Dr. Kuok King Kuok

Faculty of Engineering, Computing and Science
Swinburne University of Technology Sarawak Campus, Malaysia

Associate Professor Ts. Gs. Ir. Dr. Kuok King Kuok earned his MEng from the University Malaysia Sarawak in 2004 and completed his Ph.D. at the University Technology of Malaysia (UTM) in 2010. Presently, his academic impact is reflected in an h-index of 20 and an i10-index of 34, with over 1500 citations to his credit. His Scopus ID is 35264595700, and his ORCID ID is 0000-0003-3065-5975. He has contributed significantly to the scholarly landscape, authoring over 85 peer-reviewed journal articles, over 30 conference proceedings, and 40 book chapters. The first book he published is Metaheuristic Algorithms and Neural Networks in Hydrology, published by Cambridge Scholars Publishing. Dr. Kuok's research portfolio is diverse, spanning critical areas such as flood forecasting through Artificial Neural Networks models, the application of artificial intelligence for imputing missing data, development of filter membranes, exploration of climate change impacts, derivation of equatorial soil loss equations, low impact development, sustainable water supply, and the design of stormwater modules. His multifaceted expertise extends to building information modelling, 3D printing, and project management, reflecting a broad spectrum of research interests. With a global perspective, Dr. Kuok has established collaborations worldwide, engaging with researchers in Australia, New Zealand, Russia, UAE, the Czech Republic, Bangladesh, and Malaysia. His dedication to the academic community is underscored by his involvement in organizing 20 conferences in various capacities. Dr. Kuok's contributions extend beyond the realm of academia. He serves as a member of the Editorial Board of a few journals. Recognized for his professional competence, Dr. Kuok is a registered Professional Technologist with the Malaysia Board of Technologists (MBOT) and holds the qualification of a Chartered Professional Engineer in Malaysia, ASEAN, and APEC countries. Impressively, Dr. Kuok brings a wealth of practical experience, boasting ten years in industry before embarking on his academic career.

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Keynote Speaker

Ir. Ts. Dr. Sivarao Subramonian

Centre of Smart System and Innovative Design, Faculty of Industrial and Manufacturing Technology and Engineering, Universiti Teknikal Malaysia, Melaka, Malaysia

Prof. Ir. Ts. Dr. Sivarao Subramonian is a globally recognised academic and professional in mechanical engineering, currently serving as Professor of Innovative Design Engineering and Application at the Faculty of Industrial and Manufacturing Technology and Engineering, Universiti Teknikal Malaysia Melaka (UTeM), Malaysia. He is a Fellow of the Institution of Mechanical Engineers (FIMechE, UK), a Chartered Engineer (CEng, UK), and a Professional Engineer (PEng) with Practising Certificate (Malaysia). In addition, he is a certified Professional Technologist in Manufacturing and Industrial Technology, as well as a UK-Accredited Technology Transfer Professional. His international recognition is further affirmed through appointments as Honorary and Adjunct Professor at several global universities. With more than three decades of combined experience in academia and industry, Prof. Sivarao has cultivated extensive university–industry collaborations, championing research that is both innovative and impactful. His leadership has contributed significantly to the commercialisation of engineering innovations, talent development, and the enhancement of research ecosystems. Deeply committed to advancing engineering education and translational research, he actively mentors the next generation of engineering leaders while promoting knowledge transfer, research excellence, and global academic–industrial engagement.

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Keynote Speaker

Dr. Yudi Samyudia

Rector,
Universitas Pembangunan Jaya
Jakarta, Indonesia

Dr. Samyudia was appointed as Rector of Universitas Pembangunan Jaya in 2023. He has had academic career spanning more than 35 years as an academia working in Australia (Murdoch University and Curtin University), Indonesia (ITB, Universitas Katolik Parahyangan, Universitas Prasetiya Mulya), United States of America (Purdue University), Netherlands (TU Delft), Canada (McMaster University), and Malaysia (Curtin University Malaysia Campus). He got his full professorships from Curtin University in 2009. Previously, he held a number of senior administrative and leaderships positions at the university, including as the Dean of the School/Faculty and Deputy Pro Vice Chancellor at Curtin University (Malaysia Campus), as well as the Vice Rector for Academic Affairs at Universitas Prasetiya Mulya. Dr. Samyudia received a Bachelor of Engineering (Engineering Physics) from Institut Teknologi Bandung (ITB), and a PhD degree in Chemical Engineering from the University of Queensland, Australia. His research has been in the area of process systems engineering, i.e. modelling, control, optimization and design, where he has co-authored one book and published more than 100 articles in refereed journals and conference proceedings. He has been successful in securing competitive research grants from industries and government including competitive projects funded by Shell (Amsterdam, Malaysia), Akzo Nobel (Netherlands), Steel Manufacturing Companies in Canada, Bintulu Palm Oils, and Malaysian Pepper Board. He has also actively managed a number of consulting projects with industries and government. His passion has been in the area of higher education development, especially in the establishment of collaborative and multidisciplinary learning ecosystems for nurturing high quality graduates. Dr Samyudia is an honorary fellow of Malaysia Process Control Society, a Member of Professional Bodies like Institution of Chemical Engineers, UK; America Institute of Chemical Engineers (AIChE), and Persatuan Insinyur Indonesia (PII).

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Keynote Speaker

Dr. Atul Kant Piyoosh, Head of the Department of Civil Engineering at Baba Farid College of Engineering & Technology (Baba Farid Group of Institutions), is a distinguished academician with over 25 years of experience in both industry and academia. He holds a Ph.D. in Civil Engineering (Geomatics Engineering) and an M.Tech. in Remote Sensing & Photogrammetric Engineering from IIT Roorkee, along with a B.Tech. in Civil Engineering from KNIT Sultanpur. Renowned for his expertise in geomatics, remote sensing, and photogrammetry, Dr. Piyoosh has made significant contributions to research and education in the field. He was honored with the "Best Professor in Civil Engineering" award at the 11th DNA Innovative Education Leadership Awards held at Taj Lands End, Mumbai, in 2019.

Dr. Atul Kant Piyoosh

Head of the Department
Baba Farid College of Engineering & Technology
Baba Farid Group of Institutions
Punjab, India

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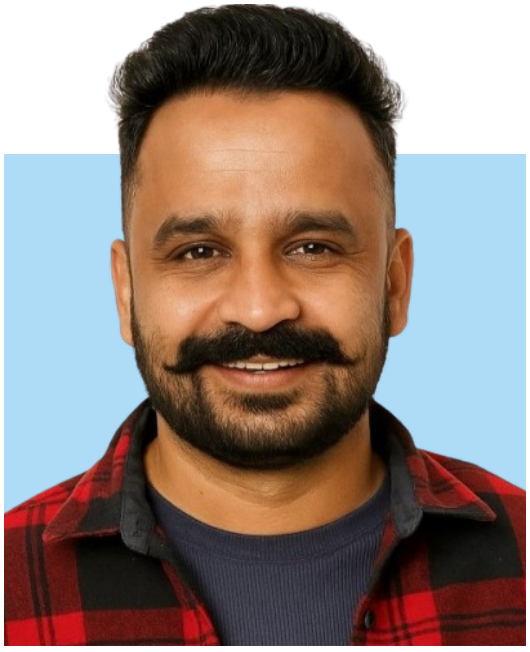
Keynote Speaker



Dr. Manpreet Singh is the Head of the Campus Product Development Division (CPDD) and Assistant Professor in the Department of Mechanical Engineering at Baba Farid College of Engineering and Technology, Bathinda. With over six years of academic and research experience, he specializes in advanced manufacturing, precision finishing processes, and machine learning applications in engineering. He has authored over 65 publications, including 21 SCI-indexed papers, and holds 12 granted patents with numerous others published or under review. Dr. Singh earned his Ph.D. from Thapar Institute of Engineering and Technology, Patiala, and actively contributes to innovation and industry-academia collaboration through real-time prototyping and consultancy projects.

Dr. Manpreet Singh

Head of the Department
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Punjab, India

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Session Speaker

Dr. Karuppasamy Periyasamy

Department of Electronics & Communication Engineering, Adithya Institute of Technology
India.

Dr.P.Karuppasamy is currently working as a Professor in the Department of Electronics & Communication Engineering, Adithya Institute of Technology , Hosur. He obtained his B.E degree in Instrumentation & Control Engineering from Arulmigu Kalasalingam College of Engineering, Krishnankoil, under Madurai Kamaraj University in the year of 1996 and M.E. degree in the specialization of Applied Electronics from Madurai Kamaraj University in the year of 2000. Then, he started his career as a Lecturer in R.V.S College of Engineering. After Three years, he changed-over his career and started to work as a Senior Lecture in the Department of Electronics & Communication Engineering, Syed Ammal Engineering College, Ramanathapuram. There he has done a various Academic Activities towards the Development of Students and growth of the Institution. He has served and gained the more than 15 years' Experience in the same Institution, He is very Specialized in Electronics and Communication Subjects He obtained his Ph.D. degree in the year of 2018 under the faculty of Information and Communication Engineering, Anna University, Chennai. After Ph.D. he has joined as a professor in the Department of Electronics & Communication Engineering, P.S.R Engineering college, sivakasi. There he has worked as a project coordinator of the Institution and students have received a 20Lakhs awards by Participating the various Project Contest under his Guidance. His areas of interest are Non Destructive Testing(NDT), Image processing, IOT, Semiconductor Electronics, Analog & Digital Communication and Data analytics. Also he has published more than 25 research articles around the world including reputed journal transactions like Springer, American Society for Non Destructive Testing (ASNT), Journal of Marine Science and Elsevier. He filed and Published 12 patents in the field of Electronics and Communication engineering. He has 23 years of experience in teaching and research. He acted as a referee in various Conferences Conducted by Reputed Institutions. He is a recognized Ph. D Supervisor of Anna University, Chennai, under Faculty of Information and Communication Engineering. He acted as a resource person for AICTE sponsored FDP and STTP Programmes organized by various Reputed Engineering Institutions. He acted as an Editor for American Journal of Science, Engineering and Technology. He is an outstanding Reviewer in Sensors and Actuators Elsevier journals. He is Actedand Acting as a Mentor for Students Projects and Evaluator of Students Project Contest like SIH (AICTE Nominee).

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Session Speaker

Dr. Amalia E. Maulana

Professor of Marketing
BINUS University
Jakarta, Indonesia

Prof. Amalia E. Maulana, Ph.D. is a Professor of Marketing at BINUS Business School, Jakarta, with over 30 years of academic and professional experience in the fields of strategic marketing, branding, and qualitative consumer research. She holds a Ph.D. in Marketing Management from the School of Marketing, University of New South Wales (UNSW), Australia, and has been instrumental in pioneering ethnographic marketing methodologies in Indonesian academia. Her research focuses on the intersection of consumer behavior, cultural insights, and brand strategy, with a strong emphasis on qualitative and ethnographic methods. She has published in international journals indexed by Scopus and continues to contribute to advancing the theoretical and applied understanding of transformative branding, stakeholder alignment, and public sector marketing. Prof. Maulana also actively mentors graduate students and integrates cross-disciplinary approaches to market research in her teaching and academic leadership. In parallel with her academic work, Prof. Maulana is the Founder and Director of ETNOMARK Consulting, a Jakarta-based consultancy recognized for applying ethnographic insights to real-world branding challenges. She has served as a strategic advisor on high-impact national projects, including the rebranding of IPB University and the SMARTFish–UNIDO Indonesia initiative with the Ministry of Marine Affairs and Fisheries. Her work exemplifies the translation of academic research into innovative, sector-transforming branding strategies.

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Session Speaker

Dr. Ir. Lilik Sutiarso

Department of Agricultural and Biosystems Engineering, Universitas Gadjah Mada
Yogyakarta, Indonesia

Professor Lilik Sutiarso is a faculty member at the Department of Agricultural and Biosystems Engineering, Universitas Gadjah Mada (UGM), Indonesia, where he has been teaching and conducting research since 1990. From 2012 to 2016, he served as Dean of the Faculty of Agricultural Technology at UGM and concurrently held the role of President of the Indonesian Society of Agricultural Engineers (ISAE). He completed his Ph.D. in Intelligent Control Systems for Agricultural Machinery at Tsukuba University, Japan. He earned his Master's degree in Agricultural Information Support Systems from the Asian Institute of Technology (AIT), Thailand, and received his undergraduate degree in Agricultural Machinery Design from UGM. Professor Sutiarso's academic interests centre on agricultural machinery and system engineering. His recent research activities are focused on biosystems modelling and simulation, along with the application of artificial intelligence (AI) in precision agriculture. He actively collaborates across disciplines with professionals in computer science, industrial engineering, and mechanical engineering. His scholarly work has been widely published in international peer-reviewed journals, and he regularly presents at global conferences on smart agriculture and biosystems engineering. At present, he leads a research consortium dedicated to creating AI-driven decision support systems tailored for smallholder farmers in Indonesia. He is a certified member of the Institution of Engineers Indonesia (IEI), recognized as a Professional Engineer (PE) in 2017, an ASEAN Engineer in 2023, and an APEC Engineer in 2025. Currently, he serves as a senior researcher at the "Smart Agriculture – Research Centre" within UGM's Department of Agricultural and Biosystems Engineering.

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Session Speaker

Dr. Ridha Sefina Samosir, S. Si., M. Kom. is an Associate Professor for Computer Science and Design Faculty of Kalbis University, Indonesia, with deep expertise in artificial intelligence, computer vision, and data analytics. She earned her Master and Ph.D. in Computer Science from University of Indonesia in 2011 and Bina Nusantara University in 2022. Since 2012, Dr. Ridha has been a core faculty member at Faculty of Computer Science and Design in Kalbis University, focusing on Data Analytics and Artificial Intelligence. She previously served as Head of Information System Study Program and Dean of Computer Science and Design Faculty. She has received multiple recognitions at international publication in International Reputable Journal and conferences for the quality of her research and the impact of her presentations.

Dr. Ridha Sefina Samosir

Associate Professor
Department of Computer Science
Universitas Kalbis, Jakarta, Indonesia

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Session Speaker

Dr. Ahmad Adeel is a Professor of Management and Organizational Behavior, affiliated with the University of Chenab, Pakistan. He completed his Ph.D. at Huazhong University of Science and Technology, China, and his postdoctoral research at Universiti Sains Malaysia. His academic background and teaching experience span leadership, organizational behavior, and human resource development. Dr. Adeel's research interests include employee creativity, leader-member exchange, and the influence of spiritual intelligence on workplace behavior. He has published in reputable journals and made significant contributions to the study of organizational citizenship behavior. His work bridges academic theory and practical application in organizational settings.

Dr. Ahmad Adeel

Department of Management and Organizational Behavior, The University of Chenab,
Gujrat, Pakistan

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Session Speaker

Ts. Dr. Norita Md Norwawi

Department of Computer Science
Universiti Sains Islam Malaysia
Negri Sembilan, Malaysia

Prof. Ts. Dr. Norita Md Norwawi is currently an Academic Fellow at Universiti Sains Islam Malaysia (USIM), with over 30 years of experience in computer science and artificial intelligence. She previously served as Professor at USIM (2014–2024), where she held various leadership roles including Dean, Director, and Head of Research Units. She holds a PhD in Computer Science from Universiti Utara Malaysia and specializes in machine learning , temporal data analytics and AI Ethics. She is a certified professional technologist and a member of several esteemed organizations such as AAAI, IEEE, ACM, and the Malaysian Academy of Professors. Internationally recognized, she has been a guest speaker and visiting scholar at global institutions including the United Nations, Oxford University, and UNESCO-related events. Dr. Norita is also active in R&D with a focus on responsible and ethical AI, smart applications and has published extensively in indexed journals. She is also the Senior Fellow of AI For Developing Countries Forum (AIFOD) and Fellow of Academy Science Malaysia (FASc).

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Session Speaker

Dr. Ir. H. Pawenary has expertise in two fields: Engineering and Management. He has completed a Master's in Project Management and a Doctoral in Management Science in the management field, as well as a Master's in Industrial Engineering and a Doctoral in Industrial Engineering in the engineering field. His leadership experience in the industry both in mass production and project management began from his role as an engineer and continued until he became Vice President of Operations. He has obtained various certifications, both in the electrical power sector and in management-related certifications. In addition to his role as an academic supervising and examining doctoral programs, he also serves as an assessor at several institutions. Currently, he holds the position of Director at PT Simentekindo and President Director at Pusdiklat Listrik Indonesia.

Dr. Ir. H. Pawenary

Associate Professor, Universitas Esa Unggul
President Director, Pusdiklat Listrik Indonesia
Director, PT. Simenteknindo, Jakarta, Indonesia

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Plenary Speaker

Dr. Jimmy Gupta is the Head of the Department at Baba Farid College of Engineering & Technology, part of the Baba Farid Group of Institutions. With over 9 years of experience in both industry and academia, Dr. Gupta holds a Ph.D. in Civil Engineering (Structural Engineering & Materials) from Lovely Professional University, an M.Tech. in Structural Engineering from VIT Vellore, a B.Tech from Punjab Technical University, and a diploma in Civil Engineering. Known for his multidisciplinary expertise, he has made significant contributions to research through numerous patents, copyrights, and the publication of three international books. Dr. Gupta's dynamic involvement in the field underscores his commitment to innovation and academic excellence.

Dr. Jimmy Gupta

Head of the Department
Baba Farid College of Engineering & Technology
Baba Farid Group of Institutions
Bathinda, Punjab, India

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Session Chairs

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Lead Robotics Process Automation Developer, ERP Smartlabs

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Dr. Nagendra

Associate Professor
Manipal Law School, India

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About Committee Members

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Dr. Ir. Gembong Baskoro
Associate Professor and Chair of Master Program, Swiss German University, Indonesia

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Vice Chancellor, Institut Teknologi PLN, Indonesia
Conference Secretary

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Assistant Professor, Department of Education, Universitas Jambi, Indonesia

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Professor, Department of Chemistry, KPRIT, India

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Forecasting Semiconductor Raw Material Availability for Timely Production and Delivery Optimization

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Abstract— The semiconductor industry relies on a consistent and efficient supply of raw materials, such as wafers, to meet fluctuating production demands. However, inaccurate demand forecasting often leads to inefficiencies, including overstocking, which ties up capital and increases storage costs, or understocking, which disrupts production schedules and results in lost orders. Ensuring an optimal supply of materials is critical to maintaining production efficiency, reducing waste, and improving overall profitability. To address this challenge, this study develops a forecasting model using time series analysis to predict future demand for critical raw materials. The models evaluated include ARIMA (Autoregressive Integrated Moving Average), ARIMAX (Autoregressive Integrated Moving Average with Exogenous Variables), SARIMA (Seasonal Autoregressive Integrated Moving Average), and SARIMAX (Seasonal Autoregressive Integrated Moving Average with Exogenous Variables). The results indicate that the SARIMAX model outperforms the other methods by incorporating seasonal trends and external factors affecting demand, leading to more accurate predictions. This research aligns with the Sustainable Development Goals (SDGs), particularly SDG 9 (Industry, Innovation, and Infrastructure) and SDG 12 (Responsible Consumption and Production). By enhancing forecasting accuracy, semiconductor manufacturers can optimize resource allocation, minimize waste, and improve supply chain efficiency, contributing to more sustainable industrial operations. Additionally, better demand prediction ensures a stable supply of essential components, supporting technological advancements and infrastructure development. Implementing robust forecasting models enables semiconductor companies to enhance production continuity, reduce material waste, and promote sustainable manufacturing practices.

Keywords— Forecasting, ARIMA, ARIMAX, SARIMAX, SARIMA, Demand Prediction, SDG 9, SDG 12

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Enhancing Emotional Understanding in Visually Impaired Children Through Multimodal Analysis

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Abstract— Children with visual impairments experience a wide range of emotions, but expressing them can be challenging. To represent their feelings, they used alternative modes of communication, including voice, touch, and sensory inputs, while relying less on expressive behaviors like facial expressions and body language. This paper presents a study for emotion recognition through multimodal physiological signals to strengthen emotional understanding in visually impaired children. The multimodal data were collected from 15 visually impaired children. We used multiscale scalograms and deep wavelet scattering networks (DWSN) to identify emotion-related characteristics and process the multimodal physiological signals. To categorize emotions into neutral, positive, and negative groups, we present a multimodal decision-level fusion framework that uses a hybrid network that combines multilayer stacking, deep learning, and weighted voting. The results of the study present valuable insights to advance the field of affect recognition for children with sensory impairments.

Keywords— Affect Recognition, Electrocortical Activity, Photoplethysmography, Visual Impairment, Emotion

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AI-Powered Leukocyte Classification: A Machine Learning Approach to Blood Diagnostics

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Abstract— White blood cells (WBCs), or leukocytes, play a critical role in the immune system, serving as key indicators for diagnosing infections, hematologic malignancies, and immune disorders. Accurate classification of WBC types—namely neutrophils, lymphocytes, monocytes, eosinophils, and basophils—is essential for effective clinical decision-making. Traditional methods of leukocyte classification, relying on manual examination of blood smears, are time-consuming, subjective, and prone to inter-observer variability. To address these challenges, artificial intelligence (AI) and machine learning (ML) techniques have emerged as transformative tools in hematological diagnostics.

This study explores the application of ML in automating WBC classification, leveraging image processing and pattern recognition capabilities to enhance diagnostic accuracy and efficiency. Advanced algorithms, particularly convolutional neural networks (CNNs), are highlighted for their ability to automatically extract intricate features from digitized blood smear images, surpassing traditional feature engineering methods. Publicly available datasets and custom-annotated image repositories serve as the foundation for model training and evaluation, with performance assessed using metrics such as accuracy, precision, recall, and F1-score.

While ML offers significant advantages, including high throughput, scalability, and objectivity, challenges such as class imbalance, data variability, and interpretability are addressed. Future directions focus on integrating explainable AI, multimodal data fusion, and edge AI for real-time diagnostics. This work underscores the potential of AI-powered leukocyte classification to revolutionize blood diagnostics, paving the way for more precise, efficient, and accessible healthcare solutions worldwide.

Keywords— White Blood Cell Classification, Machine Learning in Hematology, Artificial Intelligence in Diagnostics, Convolutional Neural Networks (CNNs), Automated Blood Smear Analysis

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Application of Machine Learning Algorithms in the Methodology of Mathematics Teaching

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Abstract— In the shifting educational paradigm, incorporating Artificial Intelligence (AI) in general, and Machine Learning (ML) in particular, into teaching has truly become a trend of transformation. Mathematics, as a core subject based on logical reasoning and analytical thought, has ample opportunities for ML-infused teaching techniques. This article reviews methods of embedding machine-learning algorithms into mathematics instruction. The analysis covers adaptive learning systems, predictive analytics, and intelligent tutoring systems, paying attention to the theoretical, methodological, and ethical levels. The article concludes by reiterating the importance of a data-driven model of teaching in current mathematics education and outlines the possible future directions for research.

Keywords— Machine Learning, Mathematics Education, Adaptive Learning, Educational Technology, Predictive Analytics, Instructional Methodology, Artificial Intelligence in Teaching

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Towards a National Biofouling Management Framework: Assessing Malaysia's Status and Strategy to Mitigate the Introduction of Invasive Aquatic Species

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Abstract— Biofouling is increasingly recognised as a major vector for the invasive aquatic species introduction (IAS), posing threats to marine biodiversity, national economic sectors, and public health. In Malaysia, the rapid growth of maritime activities, particularly in high-traffic zones such as the Straits of Malacca, has elevated the risk of IAS transmission. This paper aims at assessing the national status assessment of biofouling management in Malaysia. Through literature reviews and focus group interview involving 67 respondents, this study investigates existing regulatory frameworks, examines pathways of biofouling and IAS transfer, and evaluates vulnerable marine sectors and ecosystems. The findings reveal that there is a need of a cohesive national framework to address biofouling risks, with current measures focused on ballast water management. Regulatory gaps, enforcement challenges, limited stakeholder coordination, and infrastructure constraints contribute to the situation. Sensitive marine habitats, including coral reefs, mangroves, seagrasses, and Ramsar-designated sites, remain particularly vulnerable. The study concludes by proposing a National Biofouling Strategy that integrates international guidelines with domestic policy mechanisms, enhances monitoring and enforcement capabilities, fosters inter-agency collaboration, and supports capacity-building initiatives. Through this strategic approach, Malaysia can better protect its marine biodiversity, sustain its maritime industries, and align with global commitments on environmental protection.

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The Power of Support and Psychological Safety in Enhancing Team Adaptability Among Law Enforcement Teams

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Abstract— In today's rapidly changing work environment, team adaptability is a crucial determinant of organizational success. This study examines the relationship between team support, psychological safety, and team adaptability, focusing on the mediating role of psychological safety. Using data from 351 respondents, a one-way ANOVA was conducted to assess differences in team adaptability across demographic groups, while mediation analysis via PROCESS macro was employed to evaluate the indirect effects of psychological safety. Results indicate that team support significantly enhances adaptability, but its effect is substantially mediated by psychological safety. While team support fosters a collaborative environment, psychological safety plays a stronger direct role in enabling team members to share ideas, take calculated risks, and adjust to change. These findings emphasize that while providing team support is essential, creating a psychologically safe workplace is even more critical for improving adaptability. Organizations should focus on leadership development, transparent communication, and non-punitive feedback mechanisms to cultivate psychological safety and maximize team adaptability. This study contributes to existing literature by highlighting the interactive effects of support and safety in shaping adaptive team behaviors. Future research should explore contextual factors such as leadership styles and industry-specific challenges to deepen the understanding of how teams adapt in various organizational settings.

Keywords— Organizational Behavior, Psychological Safety, Team Adaptability, Team Support, Law Enforcement Teams

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Energy Transition in the Universities

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Abstract— The aim of this study is to achieve greater output by examining the existing way of coordi-nating the determined attempts of energy transition in the Universities in South Africa to successfully reach the environmental sustainability by using energy source which is envi-ronmentally friendly. Furthermore, into the study we look at obstacles that prevent and those that leads to maximum utilization of energy transition measures and highlights the effects of implementing renewable energy source in the Universities in South Africa. The investigation and analysis have shown that energy transition is not well received in the Universities in South Africa and that the use of renewable energy source is minimized and not fully utilized due to budget constraints and lack of knowledge. Another detection was that lack of government structured and strategic measures of implementing and motivating the use of renewable energy source effectively. The effective and rational use of renewable energy in the Universities in South Africa is a key player in developing the environmental sustainability. The use of renewable energy source has contributed an increase in economic and improve environmentally friendly in South Africa. The slow pace adoption of energy transition is negatively impacting on the benefits of cheap available energy source in South Africa. In conclusion the study finds that the economy can be boosted by implementing re-newable energy sources and improve environmental sustainability in the Universities in South Africa. Faced with the challenges of climate change, limits on fossil fuel resources and the prospects of development, it is reasonable to conclude that some other sort of energy transition must occur. These will also stabilize the negative impact of energy raising prices.

Keywords— Energy Transition; Energy Efficiency; Climate Change

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A Survey and Analysis of Few SNP Identification Tools

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Abstract— SNPs are the most common type of variation in human genome. There have been prominent endeavours such as SeattleSNPs Variation Discovery Resource, SNP500Cancer project by Cancer Genome Anatomy Project (CGAP) and International HapMap Project which generated and catalogued extensive amounts of data on sequence variations especially SNPs. There is an extensive range of Bioinformatic databases, software, tools and resources that cater to storage and analysis of genetic data, identification of SNPs and annotation of SNPs. Identification of SNPs is highly important in disease prediction, prevention and treatment planning and ultimately in reducing the mortality. In this paper, implementation results of few state-of-the-art SNP identification tools are presented.

Keywords— Single Nucleotide Polymorphisms, SNPs, SNP identification, SNP tools

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From Individuals to Teams: An Integrative Review on Adaptability and Resilience in a Tactical Environment

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Abstract— In dynamic and high-pressure tactical environments, such as those faced by military and security forces, adaptability and resilience are crucial for maintaining sustained operational effectiveness. While a substantial body of research has explored these constructs, there is limited integration across individual and team-level factors within such settings. This study aims to systematically review and synthesise existing literature on the psychological and social determinants of adaptability and resilience in tactical environments. Employing the ROSES (Reporting Standards for Systematic Evidence Syntheses) methodology, articles were identified through two major academic databases: Scopus and Web of Science. The review consisted of three core stages: identification, screening, and eligibility assessment, resulting in the selection of 12 relevant empirical studies published between 2002 and 2024. Duplicates were removed, and inclusion criteria focused on peer-reviewed studies involving military, paramilitary, or emergency personnel. The findings were analysed thematically and categorised into five core domains: (1) Cognitive Competence, (2) Emotional Regulations, (3) Personality Attributes, (4) Team Dynamics, and (5) Adaptive Outcomes. Across the reviewed studies, factors such as self-efficacy, cognitive flexibility, boldness, mindfulness, cultural intelligence, and shared adversity were found to significantly influence adaptability and resilience at both the individual and team levels. This integrative synthesis underscores the value of multilevel frameworks in informing training, leadership development, and resilience-building strategies in tactical settings. The review also highlights theoretical gaps and methodological limitations, providing directions for future research to strengthen performance and cohesion under stress.

Keywords— Adaptive Performance, Team Resilience, Tactical Environment, Security Forces

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Comparison of Analytic Hierarchy Process and Fuzzy Analytic Hierarchy Process: Allocation of Photovoltaic Electric Vehicle Charging Stations in Malaysia

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Abstract— The siting of photovoltaic electric vehicle charging stations (PEVCS) requires careful evaluation of multiple criteria, which necessitates reliable methods for criteria weighting. This study compares two widely used multi-criteria decision-making (MCDM) methods—Analytic Hierarchy Process (AHP) and Fuzzy Analytic Hierarchy Process (FAHP)—in determining criteria weights for allocating ideal PEVCS locations in Malaysia. In this study, a total of six main criteria and twelve sub-criteria are considered based on the evaluation of seven experts. Generally, the AHP method provides a straightforward hierarchical framework, and FAHP integrates fuzzy logic to address vagueness and imprecision in expert judgments. To avoid getting the null weight in the FAHP results, a modified version of Chang's Extent Analysis Method (Approach #4) is employed. The resulting global weights from both methods are applied in a Geographic Information System (GIS) environment to generate final suitability maps. Hence, the results showed significant differences in criteria priorities between the two methods, with FAHP offering more stable and realistic weight distributions. However, the study contributes to the growing field of GIS-based MCDM in sustainable infrastructure planning, and both methods are used to predict the ideal locations of PEVCS. Future work may explore additional weighting techniques, broader study areas, or integration with data-driven approaches.

Keywords— Analytic Hierarchy Process (AHP), Fuzzy Analytic Hierarchy Process (FAHP), criteria, weight, photovoltaic electric vehicle charging stations (PEVCS), Malaysia

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Corporate Accountability for Workplace Fatalities: Why India Needs a Law on Corporate Manslaughter

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Abstract— The Bhopal Gas Tragedy, 1984 was one of the gravest industrial disasters in the history of India and the world. It brought to the forefront the Indian legal system's failure in holding corporations criminally accountable for causing mass fatalities, whether intentional or due to negligence. This paper examines the Bhopal Gas Tragedy as a case study, highlighting the systemic corporate and regulatory failures that led to the incident, while arguing for the enactment of corporate manslaughter laws in India.

It traces the origin and evolution of corporate criminal liability in common law while bringing out a comparison between the Indian legal framework and the United Kingdom's Corporate Manslaughter and Corporate Homicide Act, 2007. The study demonstrates how the current statutes in Indian law such as The Bharatiya Nyaya Sanhita(BNS) 2023, The Environment (Protection) Act 1986, and The Factories Act 1948, fail to address deaths caused by corporate negligence.

Additionally, it analyses Indonesia's forward-looking approach to corporate criminal liability through Supreme Court Regulation No. 13 of 2016, which acknowledges that corporations can be perpetrators of crime through omission, negligence and systemic failure. This paper tries to derive insights from Indonesia's corporate liability framework and successful prosecutions and proposes similar legislation in India to handle corporate manslaughter.

It further recommends establishing a bilateral mutual legal assistance treaty (MLAT) between India and Indonesia to enable evidence sharing and effective handling of cross-border criminal matters. Relying on legal literature and successful prosecutions in the UK and Indonesia, this study argues for reforms in corporate liability in India centered around duty of care, accountability of senior management, and strict penalties that act as deterrents. Finally, it presents a legal, normative and policy-based case and offers recommendations to close gaps in corporate accountability with the ultimate aim of ensuring justice for victims of corporate manslaughter.

Keywords— Bhopal Gas Tragedy, Corporate Manslaughter, United Kingdom's Corporate Manslaughter and Corporate Homicide Act, Corporate Liability, Bilateral Mutual Legal Assistance Treaty (MLAT)

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Solar Quest: Innovate To Capture More Sunlight and Boost Energy

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Abstract— A solar tracking device is a system designed to increase the efficiency of solar panels by dynamically adjusting their position to follow the sun's trajectory throughout the day. This technology improves solar energy capture by ensuring that the panels are always oriented toward the sun, maximizing exposure and optimizing energy production. Solar tracking systems can be classified into two types: single-axis and dual-axis, with each type offering varying levels of tracking precision and complexity. The implementation of solar tracking devices significantly enhances the performance of solar energy systems, reducing the overall energy costs and increasing the return on investment for solar power installations. This abstract explores the principles, types, and benefits of solar tracking systems, as well as their potential to play a key role in advancing renewable energy technologies.

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Evaluation of Circular Economy Intervention for Food Loss & Waste in Developing Countries

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Abstract— Food loss and waste (FLW) remain a significant barrier to achieving Sustainable Development Goal (SDG) 12.3, which targets a 50% reduction in per capita food waste and substantial food loss reduction across the supply chain by 2030. Circular Economy (CE) provides a systemic framework to accelerate this target through enhanced efficiency and value recovery. This study employs a PRISMA-guided systematic literature review of 23 peer-reviewed Scopus-indexed articles, supplemented by global technical reports and industry datasets, to assess the cost-effectiveness and feasibility of various CE interventions for FLW mitigation. Using a two-level entropy weighting and TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) approach, the analysis quantifies the Cost Impact (CI) and Ease of Implementation Composite (EOIC) while qualitatively integrating risk factors into policy assessment. The results identify community-scale composting, CE-based policy redesign, and supply chain optimization as the most cost-effective and feasible solutions for developing countries. At the same time, advanced digital interventions face higher implementation risks due to infrastructure constraints. The study highlights that successful CE adoption requires not only technological innovation but also an adaptive policy design, institutional capacity building, and integrated financing mechanisms tailored to local contexts.

Keywords— Food Loss and Waste, Circular Economy, MCDM, TOPSIS

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Key Drivers of Centralized Procurement Models in the Indonesian Construction Sector: A Comprehensive Case Analysis of PT Wika Gedung

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Abstract— This study explores the centralized procurement model as a strategic initiative to enhance efficiency, transparency, and cost control in Indonesia's construction sector, particularly within state-owned enterprises such as PT Wika Gedung. Responding to increasing project complexity and the need for organizational competitiveness, the study aims to identify and analyze the key factors driving the successful implementation of centralized procurement. A quantitative approach was employed using survey data from 60 respondents across various procurement-related roles. Data analysis utilized Exploratory Factor Analysis (EFA) and linear regression to measure the contribution of each factor. The results identified three critical drivers: PROVE (Procurement-Oriented Values & Engagement), D-TRACE (Digital Transparency and Centralization Efficiency), and VENSTRAC (Vendor Transparency & Relationship Acceleration in Centralization), contributing 51%, 49.4%, and 53.2% respectively. Simulation results suggest that without optimizing these factors, system effectiveness could decline by up to 2.5 times, whereas proper implementation may increase effectiveness by 1.2 times. The study provides actionable insights for construction firms aiming to develop scalable and sustainable procurement systems. It also contributes to academic discourse by integrating organizational culture, digital transformation, and vendor collaboration into the framework of centralized procurement strategies in developing countries.

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Optimizing Multichannel Book Distribution Efficiency through Machine Learning: Demand Forecasting and Centralized Warehousing Strategy at PT Mizan Media Utama

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Abstract— This study aims to optimize distribution efficiency in the multichannel book industry by integrating machine learning-based demand forecasting with centralized stock allocation strategies. PT Mizan Media Utama, a national book distributor, has faced stock imbalance issues due to demand variability across channels and limitations of conventional forecasting methods. Using secondary sales data from 2022 to 2024 covering offline bookstores, online marketplaces, resellers, and events, this research applies XGBoost, Deep Learning, and Neural Network algorithms to forecast monthly demand. The models were developed using RapidMiner and evaluated using RMSE, MAPE, and R^2 metrics. XGBoost achieved the highest performance with an RMSE of 158, MAPE of 25%, and R^2 of 66.3%. The forecast outputs were then used to design a proportional stock allocation strategy, incorporating a 10% safety buffer for seasonal peaks. The integration significantly reduced overstocking risks by up to 15% and improved distribution responsiveness. This study contributes to the data-driven supply chain literature and offers practical insights for the publishing industry in leveraging predictive analytics for smarter, more efficient inventory management.

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Correlation Between E-Word of Mouth and Fear of Missing out Towards Impulse Buying for Fast Produce Skincare and Makeup

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Abstract— This study investigates the influence of Electronic Word of Mouth (E-WOM) and Fear of Missing Out (FOMO) towards impulse buying behaviour in the fast producing skincare and makeup market in Indonesia. With the rapid growth of the internet and social media, particularly Instagram, TikTok and e-commerce and beauty products marketing has evolved significantly. This research employs a quantitative approach by using structured questionnaires distributed to 100 respondents from the age of 11 to 31 years old, active users and consumers of popular fast beauty brands. Data analysis through multiple linear regression using SPSS reveals that both e-WOM and FOMO significantly affect impulse buying tendencies. E-WOM, driven by influencer endorsements and reviews, shaped the consumer perception and purchase intention. FOMO triggers anxiety about missing trends, prompting spontaneous purchases. This study highlights how the interaction between e-WOM and FOMO creates a dynamic that intensifies impulse buying in a highly competitive beauty market with frequent launches. These findings emphasize the importance of brands to use social media marketing and manage consumer psychological triggers to sustain market share.

Keywords— Electronic Word of Mouth, Fear of Missing Out, Impulse Buying, Fast Produce Beauty Products, Marketing

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New Concept for Oil and Gas Field Development with High CO_2 Gas Content Using Bioconversion Techniques of CO_2 to CH_4 and Bioaugmentation with Rumen

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Abstract— One of the challenges in developing high CO_2 is technical and commercial factors. Using techniques and technology that are commonly used today is apparently not able to answer commercial and economic problems, especially if it has to be built offshore. With so many prospects, breakthroughs and new concepts are needed for development methods. Seeing this case, new breakthroughs are needed in the concept of developing gas fields with high CO_2 content, including Natuna and others. For this reason, the Geological Innovation and Reservoir Innovation functions of Pertamina Hulu Energy; Sub Holding Upstream propose a new concept for developing fields with high CO_2 levels using bioconversion and bioaugmentation technology by utilizing indigenous methanogenic microorganisms and rumen fluid to reduce CO_2 levels by converting them into hydrocarbon products in the form of methane gas (CH4). The most crucial stage in this research is to determine the potential of rumen fluid microorganisms for bioconversion of CO_2 gas into CH_4 and to determine the interaction between rumen microorganisms and formation water and oil condensate microorganisms. The expected interaction is synergy so that it can increase CH_4 gas production in gas wells when applied. The results of laboratory scale research show that rumen fluid microbes are able to interact positively with microbes from formation water in the bioconversion of CO_2 to CH_4. The media formulation for inoculum production is 87% formation water, 4% condensate oil, and 7% rumen fluid and 0.001% NPK under anaerobic conditions. The microbial inoculum of rumen fluid and formation water converts CO_2 into CH_4 at a temperature of 800C and a pressure of 1175 psi of 1.53 (CH_4>CO_2) to 8.99% (CO_2>CH_4) after 63 days of incubation in a 1 L fermenter or canister. 1175 psi. It is necessary to carry out “upscaling” in larger volumes for further research which can be carried out in reservoir or ex situ conditions.

Keywords— Rumen, Bioconversion, Bioaugmented, Methanogen Indigenous, Canister

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Transforming Global Food Systems through the Integration of Ethical Principles, Sustainability Metrics, and Consumer Trust within Supply Chain Frameworks

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Abstract— Today, global food systems face serious challenges from climate change, growing ethical concerns, and increasing consumer expectations. These challenges demand new ways of thinking about how we produce, process, and deliver food. This paper explores how ethical values, sustainability goals, and consumer trust can work together to create stronger and fairer food supply chains. Instead of focusing only on speed and profit, the study looks at how food systems can better support public health, protect the environment, and respect human values. Using recent research from food science, ethics, and consumer behavior, the paper shows that adding these values to food supply chains improves transparency, trust, and long-term success. It also highlights the need for teamwork between farmers, companies, governments, and consumers to make real and lasting change. By connecting food safety with ethics and sustainability, this study offers a new direction for building healthier, more responsible, and more trusted food systems.

Keywords— Sustainable food systems; Food ethics; Consumer trust; Public health; Food supply chain; Environmental sustainability; Social values

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SPBE Assessment Model: Leveraging Structural Equation Modelling (SEM) as the Primary Analysis within the Government Domain

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Abstract— Identification of influential factors in the context of SPBE domain is needed to provide guidelines for policy makers in directing the available resources to improve the indicators in that domain. This research attempts to identify a model of the influence of the SPBE Governance domain on other SPBE domains, namely the Internal Policy, Management and Services. The measurement and structural model are constructed using Partial Least Square SEM. The assessment result demonstrates the significance of the relationship among constructs of the proposed model. This significance is supported by the T-values and the P-values which fall within the specified threshold, as well as the absence of zero values within the specified confidence interval. In addition, there is no collinearity among constructs and the coefficient of determination (R square) of the constructs are within the specified range. Hence, it can be concluded that the Governance domain has a significant effect on Internal Policy, Management, and Service domains.

Keywords— e-Government, PLS-SEM, SPBE, Planning, ICT Infrastructure, Human Resources

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Real Time Sentiment Analysis: A Machine Learning Based Approach to Unravel Conversational Dynamics

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Abstract— In the contemporary digital landscape, the immense volume of textual and spoken data presents opportunities and challenges for extracting meaningful insights into human sentiments and emotions. The current research work introduces a novel, ML-driven framework for real-time sentiment and emotion analysis from conversational data. Addressing the limitations of static analysis and the need for adaptability, this system dynamically captures the evolving sentimental and emotional states in live conversations.

The framework employs a dual-modality approach, integrating a robust Natural Language Processing (NLP) pipeline for analysing text input and an integrated Vosk ASR-driven speech-to-text transcription for processing spoken data. This allows for real-time sentiment and emotion analysis from both conversational modalities. It leverages transformer-based models like DistilBERT for granular sentiment classification and DistilRoBERTa for emotion classification, ensuring operational efficiency even in connectivity-limited environments. A key feature of the current system is the dynamic visualization of sentiment shifts, providing moment-by-moment and cumulative insights into conversational dynamics. Further, the data generated during the analysis is also stored automatically with timestamped results for comprehensive post-analysis.

Experimental evaluation on diverse conversational datasets validates the effectiveness of the model in reflecting sentiments and emotional dynamics. This technology is thus projected to offer significant advancements for critical domains such as customer service, legal proceedings, market research, and therapy sessions, fostering more emotionally intelligent human-computer interactions and driving enhanced decision-making across various industries.

Keywords— Sentiment Analysis, Emotional Analysis, Natural Language Processing, Machine Learning

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Exploring Common Challenges and Coping Strategies in Project Proposal Preparation Among Undergraduate Students: A Qualitative Study

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Abstract— The ability to write a coherent and structured project proposal is a critical academic skill for undergraduate students. However, many students experience considerable challenges during the proposal development process due to limited exposure to academic writing requirements, insufficient instructional support, and resource constraints. This qualitative study investigates the common challenges faced by undergraduate students in preparing project proposal papers and explores the coping strategies they employed to overcome these obstacles. Semi-structured interviews were conducted with five students enrolled at a Malaysian university, and data were analyzed thematically. Four key challenges emerged: lack of familiarity with proposal format, difficulty generating appropriate and original ideas, time management issues, and limited access to quality reference materials. Despite these barriers, students adopted effective strategies such as peer collaboration, consultation with lecturers and experienced peers, referencing previous proposals, and implementing improved time management techniques. The study concludes that while students exhibit adaptability and resourcefulness, institutional support structures remain crucial. The findings underscore the importance of integrating a structured project management module within the academic curriculum to provide students with clear guidance, practical tools, and mentorship opportunities. Such interventions can enhance students' proposal writing competencies and ultimately contribute to improved academic outcomes and research engagement.

Keywords— Project Proposal, Undergraduate Students, Qualitative Analysis, Educational Support, Project Management Module

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Advancing Project Management Education Through a Tailored Module at UiTM

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Abstract— Project management (PM) is a vital skill across various industries, and its integration into higher education has become increasingly important. However, in academic programs like administrative science, there is a notable gap in structured, contextually relevant PM education. This study aims to explore the challenges faced by students in preparing project proposals and the strategies that can be employed to improve their understanding and application of project management concepts. Through in-depth interviews with two experts in the field, the research identifies key issues students encounter, including difficulty in scoping projects, ineffective use of PM tools (such as work breakdown structures and risk assessments), and challenges with time management and budgeting. The findings emphasize the need for a comprehensive PM module that blends academic writing skills with practical project planning techniques. Key strategies for overcoming the challenges include providing structured templates, early topic refinement sessions, regular consultation opportunities, and hands-on experience with PM tools. Additionally, the experts highlight the importance of addressing common student misconceptions about PM processes and the rationale behind them. The study concludes that developing a tailored PM module for administrative science students is essential to bridge the gap between theory and practice. Such a module should not only equip students with the necessary technical skills but also provide them with the academic and practical tools to create industry-relevant project proposals. The research highlights the potential for curriculum innovation in higher education to better prepare students for the complexities of project management in the real world.

Keywords— Project Management, Education, Module

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The Role of Digital Technologies in Enhancing Psychomotor Learning Outcomes in Vocational Education

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Abstract— This study sought to investigate the impact of digitalization on vocational technology curriculum. A quasi-experiment was conducted to assess the functionality and usability of the digital technology as well as its effect on psychomotor performance. There were 47 respondents from the Bachelor of Engineering Technology in Vocational programme that participated in the study. The study found that the digital technologies had a significant positive influence on the psychomotor achievements of the students. The functionality of the digital technologies was evaluated based on its capacity to deliver the desired learning outcomes and its compatibility with the existing curriculum. The results of these evaluations demonstrated a significant increase in the psychomotor performance of the students, indicating that the digital technologies was able to improve their practical skills. This study concluded that incorporating digital technologies into the curriculum for vocational technology had a significant positive influence on the psychomotor achievements of students. The digital technology is functional, usable and effective in facilitating learning, providing students with a positive educational experience. These results suggest that incorporating digital technologies into a programme for vocational technology can be a valuable addition to conventional learning methods.

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Hybrid Deep Learning and Rule-based Approach for Real-time Vulnerability Detection in Ethereum Smart Contracts

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Abstract— Project management (PM) is a vital skill across various industries, and its integration into higher education has become increasingly important. However, in academic programs like administrative science, there is a notable gap in structured, contextually relevant PM education. This study aims to explore the challenges faced by students in preparing project proposals and the strategies that can be employed to improve their understanding and application of project management concepts. Through in-depth interviews with two experts in the field, the research identifies key issues students encounter, including difficulty in scoping projects, ineffective use of PM tools (such as work breakdown structures and risk assessments), and challenges with time management and budgeting. The findings emphasize the need for a comprehensive PM module that blends academic writing skills with practical project planning techniques. Key strategies for overcoming the challenges include providing structured templates, early topic refinement sessions, regular consultation opportunities, and hands-on experience with PM tools. Additionally, the experts highlight the importance of addressing common student misconceptions about PM processes and the rationale behind them. The study concludes that developing a tailored PM module for administrative science students is essential to bridge the gap between theory and practice. Such a module should not only equip students with the necessary technical skills but also provide them with the academic and practical tools to create industry-relevant project proposals. The research highlights the potential for curriculum innovation in higher education to better prepare students for the complexities of project management in the real world.

Keywords— Ethereum Smart Contract, Vulnerability Detection, CNN-BiLSTM, Rule-Based System, Real-Time Security

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Digital Flashcard Mobile App

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Abstract— Studying for exams is not always easy, and many students use flashcards to help memorize important information. But carrying stacks of cards everywhere is not exactly practical. That is why our team created FlashPrep—a simple mobile app that lets students make and review digital flashcards on their phones. It is a more convenient and fun way to study, whether you're at school, on the go, or at home.

We built the app using MIT App Inventor, a free, beginner-friendly platform that allows users to design Android apps using block-based coding (MIT App Inventor, 2024). Our goal is to make studying easier, more organized, and accessible for everyone—especially during exam season.

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NutriScan AI: A GPT-Powered Clinical Tool for Real-Time Food Label Risk Assessment and Personalized Multilingual Nutrition Guidance

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Abstract— *Background:* Despite the proliferation of AI tools in nutrition, few are tailored for real-time, clinical-grade food label analysis in low-literacy, multilingual populations. Misinterpretation of packaged food labels can lead to harmful dietary choices, especially for individuals managing diabetes, hypertension, chronic kidney disease (CKD), or food allergies.

Objective: This paper presents NutriScan AI, a clinical-grade GPT-powered system designed for real-time multilingual food label interpretation, dietary risk detection, and personalized nutrition guidance based on an individual's health profile.

Methodology: NutriScan AI combines OCR with GPT-based natural language processing to extract and analyze food label content, including nutritional facts, additives, allergens, and regulatory compliance. It cross-references these with standards from the Food Safety and Standards Authority of India (FSSAI), Indian Council of Medical Research (ICMR), U.S. Food and Drug Administration (FDA), Codex Alimentarius, American Diabetes Association (ADA), World Health Organization (WHO), and American Academy of Allergy, Asthma & Immunology (AAAAI). The system flags dietary risks like excessive sugar, sodium, or banned additives and provides tailored guidance for chronic conditions. Preliminary testing (formal pilot tests) across 80 outpatient interactions in Tamil Nadu (using Android-based tablets) indicated improvement in label comprehension and clinician support, as measured through structured feedback forms and observed user interactions. Outputs are available in English and Tamil, with planned expansion into Hindi and other languages.

Conclusion: NutriScan AI bridges the gap between food label literacy and preventive healthcare. By aligning clinical AI with regulatory intelligence and multilingual accessibility, it serves both individual users and public health systems. The tool has potential as a policy-aligned digital infrastructure for nutrition literacy and chronic disease risk triaging.

Keywords— Food Label Analysis, Nutrition Informatics, Diabetes Nutrition, Clinical AI, Multilingual Health Tech, Food Safety, OCR, Preventive Care, Chronic Disease Management, FSSAI, NutriScan AI

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Lignocellulosic Crop Residues: A Possible Review on Sustainable Feedstock for a Range of Value Added Products

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Abstract— Globally, large volumes of agro-food industry leftovers are produced. The majority of the components in these wastes are lignocellulosic ones. Which can be used to make goods with additional value. The bioconversion of lignocellulosic waste using technologies like Solid-State Fermentation (SSF), which produces a range of bio-products and benefits the economy and environment. Crucial elements of the SSF include choosing the appropriate and suitable microbe and substrate, as well as the optimal conditions for the procedure to promote the growth of the microorganism. In essence, using the fermentation process, SSF makes use of agro-industrial wastes including deoiled rice bran, paper pulp, wheat bran, sugarcane bagasse, straws, and so on. The materials are not exposed to free water, but rather have precisely the right amount of moisture for the microbe to grow. It entails the gradual and consistent use of substrates that are suitable for extended fermentation times. Because SSF technology uses naturally existing substrates to produce a variety of industrial enzymes, it is therefore an affordable method for producing lingo-hemicellulytic enzymes.

Keywords— Lignocellulosic Materials, Substrate, Bio Products, Agro-Industrial, Enzymes

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An Overview of Neuromorphic Computing and Applications

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Abstract— The Artificial Intelligence is rapidly growing technology widely. In AI one important component is neuro-inspired computing chip. Neuromorphic algorithm implements the internal structure and operation of the human brain. It also represents a different development approach of intelligent computing. AI workloads and neuromorphic computing provided advantages in computer power over traditional system and power of efficiency in a system. In this paper comparison of von Neumann's computer architecture over the neuromorphic systems is discussed. We have analysed the researchers invested in neuromorphic models, algorithms and its applications. This paper presents a review on the neuromorphic algorithm's model using secondary data and its merits for advancement in new research applications. We have implemented the neuro-inspired model using Hopfield algorithm.

Keywords— Neuromorphic Computing, Neuro-Inspired Model, Hopfield Algorithm, Artificial Intelligence

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Socialization of Malaria as Endemic in Iran (Communication Analysis)

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Abstract— According to UNICEF, Iran's Primary Health Care (PHC) System is known to be a role model program for the Health sector that can be adopted by other countries, both in terms of network expansion and outreach as well as successful relationships between the Health Sector and Medical Education institutions, such as Medical Universities.

Other development in this sector including The World Health Organization (WHO) that has launched a new project with financial support from the Government of Japan to revive malaria prevention and control in the southeastern province of Iran, where there are many elderly people and toddlers as well as Afghan refugees. Iran is on the right track to eradicating malaria. But recently, floods caused by climate change have impacted the country, the presence of these floods has expanded mosquito habitats and encouraged the transmission of malaria.

The Reinforcing Malaria Elimination as Humanitarian Assistance in the Islamic Republic of Iran project initiated by WHO will run throughout 2024. WHO is implementing the project together with the Iranian Ministry of Health and Medical Education, the WHO website reported on March 20. 2024 (www.tehran times.com March 23, 2024).

The expansion of mosquito habitat in the country's southeastern provinces is a direct result of climate change-induced flooding in Pakistan in 2022. Following this, malaria incidence increased more than fivefold from 2022 to 2023 in another Iranian province, namely Sistan -Baluchestan. This is important for countries that did not report any malaria cases in 2018 and 2019.

Sistan-Baluchestan was hit by heavy rains and floods in February 2024 and the cross-border population movements that occur constantly in the southeastern border provinces of the Islamic Republic of Iran could make these and other conditions can further encourage local transmission. This is important for these border areas which vulnerable place for malaria spreading to carry out prevention and control efforts.

Jaffar Hussain, WHO Representative and Head of Mission to the Islamic Republic of Iran, emphasized the importance of collaborative action with the Government of Japan: "The financial support provided by the Japanese people comes at a critical time, following the recent heavy rains and flooding in the province of Sistan- Baluchestan by the end of February 2024. Through joint efforts and continued investment, WHO and its international and local partners remain steadfast in their commitment to fighting malaria and safeguarding public health in the Islamic Republic of Iran and beyond."

"The impact of climate change has caused frequent flooding in many parts of the world, including Iran," said His Excellency Tamaki Tsukada, Ambassador of Japan to the Islamic Republic of Iran. "Malaria, one of the 3 main infectious diseases in the world, spreads through mosquitoes after floods. To protect Iranians from malaria, it is important to eradicate mosquitoes, protect themselves from mosquitoes, and promptly diagnose and treat malaria cases in their early stages. We hope this project will strengthen Iran's crisis response capacity and prevent the spread of malaria and other infectious diseases." (www.tehran times.com March 23, 2024).

Japanese funding aims to reduce the risk of malaria transmission in Sistan-Baluchestan province. WHO will support the Ministries of Health and Medical Education to enable indoor residual spraying and mosquito eradication, as well as distribute long-lasting insecticidal nets containing pyrethroids. This will also support the Ministry to strengthen surveillance by increasing laboratory diagnostic capacity to detect and diagnose malaria cases. Furthermore, WHO will help improve risk communication and community engagement to reach target populations with appropriate health messages on how to protect themselves from malaria. (www.tehran times.com March 23, 2024).

Keywords— Health Service System, Triangular Cooperation, WHO, Socialization, Public Communication Process

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A Comprehensive Review of Biomass Development Targets in the Philippine Energy Plan (PEP)

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Abstract— A technical assessment of biomass development targets as outlined in successive Philippine Energy Plan (PEP) frameworks, with emphasis on installed capacity growth, policy evolution, and sectoral integration. The study analyzes biomass projections under various planning scenarios, including the Clean Energy Scenario, and identifies inconsistencies between target setting and actual deployment. Installed capacity for biomass increased marginally from 258 MW in 2018 to a projected 313.8 MW, with a long-term target of 749 MW by 2050. Despite policy mechanisms such as feed-in tariffs and proposed biomass co-firing with coal, the utilization of modern bioenergy technologies remains limited. Traditional biomass continues to dominate rural energy use, highlighting the lack of progress in clean cooking and decentralized biomass systems. The analysis underscores systemic barriers including investment gaps, fragmented institutional coordination, and insufficient resource mapping. Strategic recommendations are presented to enhance biomass integration in the national energy mix, focusing on policy alignment, financial mechanisms, and cross-sectoral energy planning to meet renewable energy and decarbonization targets.

Keywords— Biogas, Waste-to-Energy, Energy Policy, Renewable Energy, Policy Analysis

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Integrating Circular Economy Principles and Smart Technologies into Next-Generation Co-Working Spaces for Sustainable Urban Resilience

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Abstract— The rapid rise of remote work and the gig economy has dramatically reshaped the global work environment, exposing the limitations of traditional office spaces—particularly for younger professionals and entrepreneurs who seek flexibility, affordability, and collaboration. This challenge is especially pronounced in fast-developing nations such as Iran, where a shortage of adaptable and inspiring work environments inhibits the full potential of a highly educated, tech-savvy workforce, ultimately constraining innovation and economic growth. Co-working spaces have emerged as a promising response, offering shared, cost-effective environments designed to foster creativity and productivity. However, many current models still adopt limited sustainability practices and often overlook deeper environmental, social, and technological integration. This paper proposes a next-generation approach to co-working space design, grounded in circular economy principles and enhanced through the use of smart technologies, with the goal of contributing to sustainable urban resilience. Unlike conventional green building strategies, the circular economy focuses on designing out waste, keeping materials in use for as long as possible, and regenerating natural systems. From an architectural engineering perspective, this involves implementing modular construction, using material passports, planning for end-of-life material recovery, and developing shared resource systems. These principles not only reduce the environmental impact of building and operating co-working spaces but also allow for more flexible, scalable, and future-ready design solutions. Smart technologies play a critical enabling role in this framework. Tools such as IoT sensors, digital platforms for real-time material and energy monitoring, and AI-based space optimization algorithms can improve efficiency, extend the life cycle of resources, and enhance user experience. These innovations also support dynamic space utilization, predictive maintenance, and energy-saving systems that align closely with circular economy goals.

Ultimately, this research emphasizes that co-working spaces, when thoughtfully designed using circular and smart strategies, can transcend their role as simple workplaces. They can become urban catalysts—revitalizing infrastructure, supporting entrepreneurial ecosystems, promoting mental well-being, and advancing broader sustainable development objectives. By bridging technology, design, and environmental responsibility, these next-generation spaces can contribute meaningfully to building resilient, inclusive, and future-oriented cities.

Keywords— Circular Economy, Smart Technologies, Co-Working Spaces, Sustainable Urban Resilience, Modular Design, Material Passport

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The Future of E-Learning: Autonomous Personalized Educational Content Generation Powered by Agents and Generative AI

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Abstract— The rapid advancement of generative AI toward artificial general intelligence (AGI) and superintelligent AI has the potential to transform the educational landscape. This paper examines how the convergence of AI agents and generative models can autonomously create personalised learning content, potentially redefining the traditional role of teachers in schools. Although an abundance of AI-generated content is now readily available, this technology cannot replace the essential human element of teaching and learning. Social interaction and direct mentorship are crucial for students' holistic mental and social development, and generative AI cannot replicate these aspects in its current form. Using a qualitative research approach, we conducted in-depth interviews with experienced educators to gain insight into their perspectives on integrating generative AI into school environments. This study aims to identify aspects of teaching and learning activities that utilise generative AI as personalised learning content, amidst challenges regarding the need to educate students and teachers about the ethics of using AI and the necessity of a strong government framework to ensure the responsible and safe implementation of AI. The findings of this research are expected to provide insights for users, governments, and developers that leveraging AI to enhance, rather than replace, the vital role of teachers paves the way toward a safe and informative future for AI.

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Assessment of Heavy Metal Contamination in Industrial Wastewater Samples

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Abstract— Heavy metal pollution is a significant global environmental concern due to its adverse effects on aquatic ecosystems and human health. This study assessed the concentrations of heavy metals—mercury (Hg), chromium (Cr), iron (Fe), zinc (Zn), cadmium (Cd), and copper (Cu)—in the water of Bairamangala Lake, Ramnagara, Bangalore, Karnataka, under various flow conditions. Water samples were analyzed using atomic absorption spectrophotometry (AAS). The mean concentrations (ppm) detected were: Hg (0.0062), Cr (0.059), Fe (0.4), Zn (3.8), Cd (0.003), and Cu (2.01). Results revealed that mercury, zinc, and copper were present in notably higher concentrations. The levels of Hg, As, Pb, Zn, and Cd in the lake water exceeded the World Health Organization (WHO) recommended limits for drinking water (0.010 ppm for Hg, As, Pb; 3.0 ppm for Zn; and 0.003 ppm for Cd). Additionally, copper and zinc concentrations were higher during low flow conditions. The study also found elevated pH and chemical oxygen demand (COD) in the lake, indicating additional water quality concerns. These findings highlight the substantial transport and accumulation of heavy metals due to industrial effluent into the lake. There is a significant potential health risk to local residents from exposure to contaminated groundwater, particularly with elevated Hg and Cd levels. Continuous monitoring and the implementation of industrial wastewater pretreatment are strongly recommended to mitigate further contamination.

Keywords— Heavy Metals, Detoxification, Spectrophotometry, Biological Indicator, Contamination

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Retraining of Women in the Czech Republic: Comprehensive Analysis and Challenges in the Changing Labor Market

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Abstract— Dynamic changes in the Czech labor market, driven by digitalization and automation, make retraining crucial for maintaining employability, especially for women. This scholarly article comprehensively analyzes the retraining of women in the Czech Republic, examining statistical trends, motivational factors, and persistent barriers. Women participate in retraining programs more often than men, with a growing interest in selected retraining, motivated by financial stability, personal development, and the need to adapt after parental leave or to the digital economy. However, significant obstacles persist, such as gender stereotypes, discrimination in the labor market, lack of flexible working hours, and inadequate childcare. Although there are successful initiatives (e.g. Czechitas) and legislative support, overall effectiveness is limited by systemic problems. The article emphasizes the need for targeted policies and systemic changes to fully utilize women's potential in the changing labor market.

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Work Engagement Mediates the Relationship between Psychological Well-Being and Innovative Behavior in the JD-R Model for Sustainable Education

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Abstract— This study revisits the role of work engagement (WE) in fostering innovative work behaviour within the theoretical framework of the Job Demand Resources (JD-R) model. It specifically examines the mediating role of WE between psychological well-being (PWB) measured through antecedents such as meaningfulness and sense of accomplishment and IWB. The study was conducted in Malaysian educational institutions and collected responses from 477 educators. A cross sectional, quantitative research design was adopted, and Partial Least Square (PLS) Structural Equation Modelling (SEM) was used to test the proposed hypotheses. The results of this study revealed significant relationship between PWB, WE and IWB with exception that meaningfulness at work does not directly influence IWB. These results highlight the importance of WE as a vital link between personal resources PWB, and IWB. Furthermore, the results of data analysis also have revealed that PWB can lead to greater work engagement, which in turn promotes IWB in educational institutions. This study contributes to the JD-R literature by enhancing our understanding of how educator's psychological well-being can strengthen WE which in turn fosters IWB. In align with Sustainable Development Goal (SDG) 4, the findings offer practical implication by strengthening educational systems by ensuring the educators are not only equipped with adequate job resources but are also supported psychologically to sustain high levels of work engagement and innovativeness in their teaching professional.

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Mind the Gap: Assessing Knowledge, Attitudes, and Practices on Water Sustainability in Babag, Cebu City

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Abstract— Water sustainability is a critical concern for rural, agriculturally dependent communities like Barangay Babag in Cebu City, Philippines. With a population of 5,945 (2020 Census) and an economy reliant on water-intensive farming, effective water management is vital for long-term resilience. However, few studies have explored the knowledge, attitudes, and practices (KAP) related to water sustainability in Cebu's upland or rural areas. This study employed a descriptive research design to assess the KAP of 100 Babag residents. Data were gathered through structured, face-to-face surveys across various sitios, ensuring equal gender representation and diverse age and educational backgrounds. Analysis included frequency and percentage distributions, Z-tests (≡=0.05), and correlation analyses. Findings revealed generally positive attitudes, with strong recognition of freshwater scarcity (mean = 3.05) and personal responsibility (mean = 2.97). Despite this awareness, actual conservation practices were limited (mean = 2.68), highlighting a critical gap between knowledge and action. Statistical tests showed significant correlations between KAP scores and both gender and educational background, while age was not a determining factor. These results emphasize the importance of context-specific, gender-sensitive educational initiatives and practical interventions to bridge the knowledge-practice divide and strengthen community engagement for sustainable water use and environmental stewardship in Babag.

Keywords— Water Sustainability, Knowledge, Attitudes, and Practices (KAP), Rural Communities, Environmental Stewardship, Gender-Sensitive Interventions, Water Management, Descriptive Research Design, Z-test, Babag, Cebu City, Philippines

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Reviving Indian Knowledge Systems: A Literature Review on Integration Strategies within Contemporary Education Frameworks

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Abstract— This paper investigates the incorporation of Indian Knowledge Systems (IKS) in contemporary education to resolve cultural dissonance and enhance holistic learning. This article, based on a literature review, analyzes the theoretical circus cycling, the practical negotiation, and the policy planning pulling the circus into a sense of space. It highlights what has and has not worked as models for success, challenges that may be encountered, and potential options for the right balance between tradition and change. Encouraging systematic coherence, teacher capacity-building and pedagogical re-orientation forms critical strategies for the successful adoption of IKS within the contemporary curriculum regime. The review also explores the various policy interventions and innovative strategies towards the struggle to reconcile the traditional with the modern system of education.

Keywords— Indian Knowledge Systems, Integration, Education, Curriculum, Teacher Training, Holistic Learning, Cultural Disconnect, Policy Initiatives, Challenges, Strategies

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Feathers in Pixels: Exploring YOLO Algorithms for Avian Detection

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Abstract— Birds play a key role in preserving the delicate balance of nature, yet their accurate detection remains a challenging task in the domain of computer vision. The evolution of YOLO architectures presents new opportunities for exploration, particularly the comparisons of YOLOv11 and YOLOv12. This research aims to evaluate their effectiveness in identifying birds, utilising the CUB-200-2011 dataset which consists of a diverse set of 200 bird species captured across diverse environment conditions. Our research includes comprehensive performance evaluation, assessing key metrics such as Precision, Recall, F1-Score and Mean Average Precision. Notably, YOLOv12 attained a precision score of 0.802, in contrast to YOLOv11 that achieved 0.768, demonstrating better detection accuracy. The findings of this study contribute to advancing bird detection techniques in computer vision, offering potential applications in ecological monitoring and species conservation research.

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Understanding the Relationship Between Halal Food Choices and Religious Commitment Among Muslim Students in Malaysian Public Universities

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Abstract— The growing emphasis on nutrition around the world, especially among young people, has sparked a great deal of scholarly research into eating patterns and their wider effects. Muslim students at public universities in the Klang Valley of Malaysia are the subjects of this study, which looks at their halal eating habits and Islamic worldview (Tasawwur). The study examines how perception, knowledge, and religious awareness affect food choices and consumption habits. It is based on the Islamic concept of Halalan Tayyiban, which emphasizes the permissibility and wholesomeness of food. A validated structured questionnaire was used to collect data from 439 Muslim students at six major public institutions using a quantitative cross-sectional methodology. The study's theoretical underpinnings are derived from the Theory of Planned Behavior (TPB), which views religious commitment, attitudes, subjective standards, and perceived behavioral control as important factors that influence the intake of halal cuisine. The results show that respondents' Tasawwur was generally high and that halal eating habits and religious appreciation were strongly correlated. Nonetheless, disparities between generations and institutions surfaced, indicating the necessity of ongoing involvement to enhance religious dietary awareness. Despite widespread awareness, the study also finds gaps in practical knowledge regarding the preparation and certification of halal food. These results highlight the need for focused educational programs and legislative changes that reconcile religious values with modern food systems. Moreover, the research reveals the major significance of religiosity as a mediator of food behavior and its larger impact on spiritual and academic well-being. The report suggests promoting family-based halal education, enhancing halal literacy among young people, and establishing a campus climate that supports students in making educated food choices. In the end, this study advances a more sophisticated comprehension of the ways in which Islamic dietary ethics interact with contemporary academic and social settings, providing insightful information to stakeholders in the halal business, educators, and legislators.

Keywords— Halal Food, Food Choices, Religious Commitment

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Parents' Meaning of Comprehensive Sexuality Education among Early Childhood

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Abstract— Comprehensive Sexuality Education (CSE) has been globally recognized as a crucial component of child development. Comprehensive Sexuality Education is a curriculum-based learning process that covers the cognitive, emotional, physical, and social aspects of sexuality. Despite the empirical evidence of the positive impact of CSE, a potential gap exists between understanding CSE and its effective implementation, which is further complicated by the pros and cons of its application in early childhood. This study aims to explore parents' perceptions of comprehensive sexuality education in early childhood.

The research method was a descriptive phenomenological approach, aiming to explore parents' interpretations of their experiences in providing sexuality education to young children. Data collection methods use semi-structured interviews. The research participants were three married couples with young children aged 2 to 7 years who provided sexuality education to their young children and had been exposed to information about Comprehensive Sexuality Education (CSE).

The results of the study indicate that parents' meaning of comprehensive sexuality education for young children in this study encompass three aspects: parents' understanding of sexuality education, the components taught in line with the core concepts of Comprehensive Sexuality Education as defined by UNESCO, and the methods used to convey Comprehensive Sexuality Education materials using everyday experiences, discussions, and direct examples, as well as other media deemed appropriate for the children's age, such as stories in books and video clips.

Keywords— Comprehensive Sexual Education; Comprehensive Sexuality Education; Parents; Young Children

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Needs Analysis of Mental Skills Module (MSKILL) Development in Physical and Health Education Subject for Gifted and Talented Students

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Abstract— This study is a needs analysis aimed at developing a Mental Skills Module (MSKILL) for the Physical and Health Education subject for gifted and talented students in Malaysia. The specific objectives were to identify student's perceptions of the need for the module, determine the relevant constructs to be included in its design and assess the areas of mental skill weaknesses that should be addressed in the module content. A total of 214 students from a national gifted education center participated in the survey using two structured questionnaires. Data were analyzed using descriptive and multiple linear regression analyses. Findings revealed that students possessed moderate levels of overall mental skills with significant weaknesses in anxiety and worry management, self-confidence and motivation. Students showed a high level of readiness and interest in a structured mental skills module. They also preferred content that included visual aids, clear learning objectives and accessible language. Multiple linear regression analysis indicated that among the seven mental skill domains assessed, only mental imagery significantly predicted student's perceived need for the module. These findings support the inclusion of key constructs in the module's development and highlight the importance of incorporating preferred strategies and support mechanisms aligned with student's needs.

Keywords— Needs Analysis, Module Development, Gifted and Talented Students, Physical and Health Education

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A Comprehensive Neural Meta-Feature Framework Automated Model Selection

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Abstract— With the increased use of data, Meta Learning for Automated Model Selection facilitates the processing of that data. Where traditional machine learning algorithms have to be followed in a certain order, meta learning comes in handy to automate things. The biggest task for a Data Scientist or an Analyst is to choose a certain algorithm out of many available in Machine Learning, which these days is mostly found by trial and error methods. Generally, the data is trained on numerous algorithms and then compared with the results gained for each algorithm. While doing might seem easy for some, it is also a tedious task that consumes a great amount of computational power and space. To overcome these problems, one has to have knowledge of which algorithm to choose and when to choose, but again not all the people working in the industry might have that knowledge and those with the proper skills have to sit for hours just to understand the best algorithm for their data particularly in scenarios with heterogeneous data characteristics and limited prior knowledge. All that could be simplified by using Meta Learning, which provides the solution to all the stated problems we face. What is meta learning really about? It is referred to as 'learning to learn', which in layman's language can be explained by how we teach our machines to 'learn how to learn'. This paper presents the main aspect of efficiently using meta learning, i.e, to predict the best-performing classifier. That would initially require large amounts of training datasets and extracting an extensive set of 27 structural and statistical meta-features capturing dataset complexity, feature types, class distributions, and data quality aspects, which are then combined with the results of the best algorithms for those datasets. The model itself automates the selection process; all it requires is a statistical healthcare dataset.

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Low Light Image Enhancement Using Retinex-Based Framework with Adaptive Gamma Correction and Poisson Distribution

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Abstract— Low-light images often have poor visibility and noise, limiting their use for getting information from the image. These limitations can severely hinder critical visual tasks such as Object detection, recognition, and other human vision tasks. Traditional methods tend to either inadequately brighten the dark parts of the image and amplify the noise, especially in extremely dim environments. We propose a Low-Light Image Enhancement using a Retinex-based enhancement framework that decomposes the image into Illumination and Reflectance, applying adaptive gamma correction according to the pixel intensity present in the image, and then applying Poisson noise modelling to stimulate the realistic brightness adaptation. The enhanced image is reconstructed and normalized to improve contrast while maintaining the natural appearance. The matrix used is the Peak Signal-to-Noise Ratio (PSNR), and the Structural Similarity Index (SSIM) is used to evaluate the performance of the method against low-light images, i.e., the Ground truth. Experimental results on public datasets demonstrate that the proposed method improves the Perceptual quality and Structural Similarity of image comparison from other frameworks.

Keywords— Retinex, Illumination, Reflectance, Reconstruction, Enhancement, Gamma, Poisson

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AI-Driven Threat Modelling for Vulnerable Inputs

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Abstract— In the present digital age, escalating complexity and dynamic nature of cybersecurity threats necessitate a paradigm shift from reactive to proactive security methodologies. This brings us to have a very good software development method, which in turn give security from the initiation, particularly threat modelling gives a very good defence on vulnerabilities. This research paper proposes an AI-driven framework for threat modelling that explicitly leverages vulnerable inputs and suggests the parameters to be considered for the designing and efficient Threat Modelling using AI methodologies. The core objective is to develop and validate an intelligent system capable of automating and enhancing key stages of the threat modelling lifecycle. This involves employing advanced AI techniques, including machine learning for pattern recognition in vulnerability data, natural language processing to extract contextual threat intelligence from vulnerability summaries, and predictive analytics to forecast potential exploitation pathways. By systematically analysing these vulnerable inputs, the AI model aims to proactively identify systemic weaknesses, generate precise threat scenarios, assess risks with greater accuracy, and recommend context-aware countermeasures. This research seeks to demonstrate how AI can transform threat modelling into a more agile, data-informed, and adaptive process, ultimately bolstering cyber resilience.

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Analysis of AI-Driven Test Case Generation for Cybersecurity Attack Cases

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Abstract— From decades it has proven that, Software testing, is a vital component of the software development lifecycle, ensures reliability, functionality, and performance. However, traditional test case generation methods face challenges such as high time and resource demands and susceptibility to human error, especially in large-scale and complex software systems. The paper provides an extensive exploration of Artificial Intelligence (AI) applications in software test case generation, focusing on analysing current industry practices and creating a predictive model designed to optimize this critical aspect of software quality assurance. To address these limitations, the adoption of AI techniques for automating and improving test case generation has gained significant traction. This research pursues two key objectives: first, to thoroughly analyse existing AI-driven testing techniques and strategies for test case generation through an extensive review of academic literature, industry reports, and case studies. This analysis delves into search-based, machine learning approaches, and natural language processing (NLP) techniques. Furthermore, it evaluates their application across different testing levels—unit, integration, system, and acceptance testing—and software domains like web applications, mobile platforms, embedded systems, and safety-critical environments. The analysis highlights current industry practices and identifies areas where AI can significantly enhance efficiency and effectiveness in software testing.

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Mitigating Insider Threats Amidst Digital Transformation: Cybersecurity Challenges and Strategies in the Maldives

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Abstract— The Maldives' digital transformation under Maldives 2.0 introduces opportunities and cybersecurity risks, particularly insider threats. This paper examines key insider attack vectors, including password misuse, privilege abuse, data exfiltration, system sabotage, and phishing, along with human factors like organizational culture and behavior. Mitigation strategies such as access controls, threat detection tools, continuous training, and policy reinforcement are discussed. A holistic approach integrating technology, human factors, and national policies is essential to safeguard sensitive data and ensure a secure digital transformation.

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A Comparative Analysis of Automated Methods and Future Research Directions in AI Enabled Bone Age Estimation

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Abstract— Bone age estimation plays a vital role in assessing skeletal maturity, diagnosing developmental disorders, and addressing medicolegal cases for age verification. Traditional approaches, such as the Greulich-Pyle (GP), Tanner-Whitehouse (TW), and Ossification methods, have been extensively used but are often influenced by observer variability and regional demographic differences. Automated technologies have emerged as transformative tools, leveraging advanced extraction techniques like Region of Interest (RoI) segmentation and pre-processing methods to enhance radiographic analysis accuracy. Region-specific adaptations, such as the China05-RUS-CHN atlas for Asian populations, further improve the applicability of these methods across diverse demographics. Machine learning models, particularly Convolutional Neural Networks (CNNs), have been widely implemented, offering significant advantages in terms of precision and objectivity. These models are often combined with optimization algorithms, such as Genetic Algorithms (GA) and ensemble techniques, to refine predictions and improve consistency. This research focuses on integrating automated extraction methods with regional adaptations and advanced algorithms to create robust, scalable, and accurate solutions for bone age estimation in clinical and forensic applications worldwide. This paper gives a comparison of the different method to predict the bone age of the given medical image. It also gives research directions to further use the AI methodologies to be used in this domain. These studies make the age prediction more efficiently and make medical procedures faster and accurate.

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Investigating SMEs' Intention to Participate in Public Procurement in Tanzania: A Theory of Planned Behavior (TPB) Perspective on the Moderating Influence of Perceived Behavioural Control

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Abstract— This study investigates the behavioral intention of Small and Medium Enterprises (SMEs) to participate in public procurement in Tanzania using the Theory of Planned Behaviour (TPB). 190 owners and managers were surveyed from SMEs located in Dodoma and Dar-Es-Salam using structured questionnaire forms. Employing a quantitative method, this research used Partial Least Squares Structural Equation Modelling (PLS-SEM) techniques to evaluate relationships among four key constructs: Attitude, Subjective Norms, Perceived Behavioral Control (PBC), and behavioral intention to participate in public procurement. This study found that Attitude and PBC significantly affect behavioral intention, but subjective norms do not affect the intention. PBC played an important role in moderating and mediating intentions, particularly increasing the impact of attitude and subjective norms. However, contrary to expectations from theory, subjective norms did not significantly influence either attitude or behavioral intentions to participate in public procurement. These findings underscore the importance of enhancing SME capabilities and confidence in procurement processes rather than focusing solely on normative pressures. Policy interventions should prioritize enhancing SMEs' capabilities through structured training, capacity-building programs and mentorship initiatives that demystify public procurement processes.

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Exploring Primigravida Women's Awareness, Perception, and Practice with Pelvic Floor Muscle Exercises During Pregnancy: A Cross-Sectional Study

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Abstract— *Background:* Kegel exercises are recommended during pregnancy to strengthen pelvic floor muscles, potentially reducing urinary incontinence and aiding labor. However, the perception and practice of these exercises among primigravid women remain underexplored.

Objective: The primary aim was to determine the level of awareness, perception, and practice of kegel exercise among primigravid women. The secondary aim was to find the association between awareness perception and practice with participants' demographic characteristics.

Methods A cross-sectional study was conducted among 150 primigravid women attending antenatal clinics in antenatal clinic at PMCH&RI, Chennai. Data were collected using a validated, self-administered questionnaire assessing sociodemographic characteristics, knowledge, attitudes, and practice of Kegel exercises. Descriptive and inferential statistics were used for analysis.

Statistical Analysis: Results were obtained as percentages. Chi-square test was used to check for the association between awareness and perception with variables such as age, educational qualification, occupation, family income, and parity.

Results: According to the study's findings, 80.9% of participants knew a lot about PFMEs. Most people (65.9%) do PFMEs at home (81.3%), with the Kegel pelvic floor exercise being the most commonly used (93.3%). Forgetfulness was revealed to be the main factor influencing the use of PFMEs (2.81 ± 0.85). There was a significant correlation between attainment and PFME practice ($p = 0.001$ and $p = 0.041$, respectively).

Conclusion: Expectant mothers actively practise and are knowledgeable about PFME. However, forgetfulness has been found to be the main element influencing the habit. The use of PFMEs was positively impacted by knowledge and educational attainment. Therefore, it is recommended that the PFMEs program be integrated into weekly prenatal sessions and that pregnancy education be promoted.

Keywords— Pelvic Floor Muscle Exercises, Primigravid Women, Perception

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Financial Literacy among the Philippine National Police Force

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Abstract— Financial literacy encompasses a range of information and skills that individuals need to make accurate financial decisions, including managing debt, borrowing, investing, saving, and creating a budget. The research used quantitative methods. This study focused on the financial literacy of PNP personnel in Dagupan City, examining how irregular income and high-stress conditions impacted their financial decision-making and work schedules. The research emphasized that financial literacy is crucial not only for a police officer's personal life but also for their work performance, morale, and community relations. Using a mixed-methods approach, the study collected data through surveys and interviews with PNP personnel. Findings revealed a significant lack of financial management skills attributed to the absence of formal finance education in PNP training curricula and the demanding nature of police work. Recommendations emphasized the need to integrate financial literacy programs into PNP training to address these gaps. The researchers used survey information and interpretation, combining quantitative analysis of survey data with qualitative insights from interviews, focus groups, and case studies. The study found that mid-level officers, particularly Police Staff Sergeants (PSSG), were the most engaged participants, suggesting that officers with extended financial responsibilities are more likely to seek financial education. While some officers demonstrated adequate financial knowledge, most struggled with budgeting, saving, and investing. The study suggests that comprehensive financial education can be achieved through continuous literacy programs and collaboration with financial institutions to bridge this gap. The purpose is to guide future financial literacy programs for military officers, benefiting individuals, their families, coworkers, and the community

Keywords— Financial Literacy, Philippine National Police (PNP), Investment Behavior

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Optimization of Operational System within Industry4.0, Lean, Qualilty Management System in the Automotive Sector

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Abstract— During the last decade, customer satisfaction, technological evolution and social responsibility are the main keys exigences that face today's industrials companies. For is, they must refer to different methodologies to diagnose their ecosystem involving the analysis of the specific needs of their clients, to know the threats & strengths of their suppliers and to Identify their internal weaknesses and opportunities in the human, technical, and organizational aspects.

In this research, 80 articles from sciences direct and Scopus databases from 2015 to 2025 have been reviewed to check the significant impact of industrial technological innovation, Lean and also Quality System Management to obtain operational performance and the continuous improvement in automotive industry for a successful optimization of operational system especially in automotive industry.

Keywords— Industry 4.0, Lean, Quality, IATF16949, Continuous Improvement, Automotive Industry

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A Study on the Relationship Between Perceived Parenting Styles and Emotion Regulation Among Young Adults

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Abstract— This study investigates the relationship between perceived parenting styles and emotion regulation among young adults aged 18 to 25. Using a cross-sectional correlational design and snowball sampling method, data were collected from 150 participants (98 females, 52 males) through self-report questionnaires: the Perceived Parenting Style Scale (PPSS) and the Emotion Regulation Questionnaire (ERQ). Reliability analysis showed acceptable to excellent internal consistency across the scales. Spearman's rho correlations revealed that authoritative parenting was positively associated with adaptive emotion regulation strategy—cognitive reappraisal ($\rho = .334$, $p < .001$), while authoritarian and permissive styles were more closely linked to expressive suppression, a maladaptive strategy. No significant gender or age-based differences were found in perceived parenting styles. However, the marital status of parents significantly influenced the perception of authoritative and authoritarian parenting. These findings highlight the importance of supportive parenting practices in promoting healthy emotion regulation in emerging adulthood.

Keywords— Authoritative; Authoritarian; Cognitive Reappraisal; Expressive Suppression; Permissive

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Strategic Higher Education Management for Career Sustainability: A Quantitative Study on Student-Athletes' Career Readiness in Henan Province Universities

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Abstract— In an increasingly competitive and uncertain global job market, sustainable career planning has become critical, especially for student-athletes who must balance academic and athletic commitments. This study investigates the impact of higher education programmes—specifically their management structures and support systems—on the career readiness of university student-athletes in Henan Province, China. A quantitative research design was employed using a structured questionnaire administered to 382 student-athletes across six public universities. Key dimensions included institutional support, academic flexibility, career counselling services, and the integration of athletic and academic departments. Data were analysed using SPSS v29, employing descriptive statistics, Pearson correlation, and multiple linear regression.

The findings reveal a statistically significant relationship between perceived institutional support and student-athletes' career readiness ($r = .672$, $p < .01$). Multiple regression analysis showed that academic flexibility ($\beta = .415$, $p < .001$) and career counselling availability ($\beta = .371$, $p < .001$) were strong predictors of career readiness, accounting for 49.6% of the total variance ($R^2 = .496$, $F(4,377)=92.51$, $p < .001$). Notably, 63% of respondents reported inadequate coordination between academic and athletic units, while 58% felt unprepared for career transitions post-graduation. The results underscore the critical role of strategic management in higher education to ensure career sustainability for this vulnerable population.

This study contributes to both the education management and sports policy literature by positioning career readiness as a key component of sustainability in university governance. Recommendations include developing integrated dual-career pathways, enhancing cross-department collaboration, and embedding career guidance into the athletic experience. Future research should consider longitudinal tracking of career trajectories and extend the model to other provinces to assess national policy implications.

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Driving Sustainable Teaching Performance: A Quantitative Analysis of Management Factors Influencing Training Effectiveness Among Vocational College Teachers in Jiangsu Province

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Abstract— Teacher training effectiveness in vocational colleges is increasingly recognised as a key driver of sustainable educational outcomes and workforce readiness. This study explores the impact of institutional management factors on the perceived training effectiveness of vocational college teachers in Jiangsu Province, China. Using a quantitative design, data were collected from 412 teachers through a structured questionnaire comprising dimensions such as training needs assessment, administrative support, professional development planning, and post-training evaluation. Descriptive statistics, Pearson correlation, and multiple regression analysis were used to examine the relationships among these variables. Results indicate that administrative support ($\beta = .384$, $p < .001$), relevance of training content ($\beta = .356$, $p < .001$), and post-training follow-up ($\beta = .297$, $p < .01$) significantly predict perceived training effectiveness. The regression model accounted for 51.4% of the variance ($R^2 = 0.514$, $F(4, 407) = 107.32$, $p < .001$). Teachers also reported that misalignment between training content and job requirements and insufficient managerial feedback mechanisms reduce long-term effectiveness. The findings underscore the importance of strategic, management-led approaches to training design and implementation in vocational education settings. Recommendations are provided to enhance sustainable teaching performance through integrated training policies, feedback loops, and management engagement. This study contributes to the discourse on workforce-oriented education reform and offers evidence-based insights for education managers and policymakers in vocational training institutions.

Keywords— Training Effectiveness, Vocational Education, Educational Management, Teacher Development, Sustainable Teaching Performance

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The Effect of Circular Economy Innovation and Environmental Sustainable Development on the Economic Growth: A Panel Data Analysis on Asean Countries

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Abstract— This study examines the effect of circular economy, components of environmental sustainable and economic growth. This study consists of one dependent variable namely economic growth and five independent variables namely environmental tax rate, waste recycling rate, jobs in circular economy and private investment, recycling patents and recyclable raw materials trade. The objective of this paper is to identify the main components of a circular economy supporting sustainable development, the effect of environmental tax rate, waste recycling rate, jobs in circular economy and private investment, recycling patents and recyclable raw materials trade in the economic growth in the ASEAN countries. This study uses fixed effect panel data analysis and generalized method of moments. Fixed effect panel data analysis used to identify the impact of circular economy on the economic growth of ASEAN countries and generalized method of moments used to compute the Arellano-Bond dynamic method of estimation in panel data. The results show that there is a strong and positive correlation between circular economy to economic growth, environmental tax rate, waste recycling rate, jobs in circular economy and private investment to economic growth and promote wealth.

Keywords— Circular Economy, Innovation, Environmental, Sustainable, Economic Growth, ASEAN countries, Panel Data

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Proposal of a Decision Model for the Optimization of Industrial Operational Systems within Industry 4.0 in the Automotive Sector

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Abstract— During the last decade, customer satisfaction, technological evolution and social responsibility are the main keys exigences that face today's industrials companies. For is, they must refer to different methodologies to diagnose their ecosystem involving the analysis of the specific needs of their clients, to know the threats & strengths of their suppliers and to Identify their internal weaknesses and opportunities in the human, technical, and organizational aspects.

The emergence of technological innovation has significantly reshaped the industrial domain, creating both exciting opportunities and new challenges. This transformation will lead industries to review their strategies, invest in human skills Development, enhance security measures and prioritize sustainability. Although some sectors like automotive, technology and biology industry, through its commitment to overall efficiency and innovation, took the lead on the platoon of industry changes, others will have to follow the technological evolvement because this change is being done very quickly, allowing us to refer as the new Industrial revolution, commonly known as the fourth industrial revolution (Industry 4.0).(Barreto et al., 2017).

To investigate the effectiveness of emerging technologies by obtaining shortened production cycles, filling planned references in the right order and the real time and meeting customer needs on term of providing the right service to the right customer at the right time.

In this research, articles from sciences direct and Scopus database from 2015 to 2025 have been reviewed to check the significant impact of industrial technological innovation into operational systems then the findings of this research will be compared with a practical context on a company for automotive sector.

Automation of operational processes can increase efficiency, leading to a high level of service and customer satisfaction. The paper describes a case study on the automotive industry and provides an answer to our question which focuses on how technology tools can impact the operational system optimization.

By integrating all these parameters into their operations, industrial companies can better face the complexities of today's business environment, creating sustainable value for their customers, stakeholders, and society.

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Integrating Cybersecurity Awareness into National Education Curricula: Preparing Maldives for Future Insider Threats

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Abstract— As the Maldives rapidly digitizes public services and business sectors, the nation faces growing cybersecurity risks, particularly from insider threats. Despite the global recognition of early cybersecurity education as a key preventive measure, the Maldivian education system currently lacks structured awareness programs. This paper highlights the need to integrate cybersecurity content into national school curricula to equip students with essential digital safety skills. Through policy reviews, expert consultations, and international case studies, the study identifies existing gaps and proposes a practical framework for age-appropriate modules, teacher training, and public awareness initiatives. The paper calls for collaborative efforts to build a resilient, cyber-aware society capable of mitigating future insider threats.

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Individuals' Intention Toward Donation Crowdfunding: An Integrated S-O-R Framework

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Abstract— This study implements the Stimulus-Organism-Response (S-O-R) framework, integrating Social Presence Theory and core constructs from the Technology Acceptance Model (TAM). It aims to examine how project and platform characteristics influence individuals perceived social presence and attitudes toward crowdfunding, ultimately predicting their donation intentions. A quantitative approach will be employed using an online questionnaire and partial least squares (PLS) for data analysis. The findings will offer practical insights for government bodies overseeing crowdfunding platforms and for campaign initiators seeking funding within set timeframes. Additionally, the study will identify the most influential attributes driving donor behaviour and highlight areas needing improvement, while also contributing valuable theoretical implications.

Keywords— Donation-Based Crowdfunding; Donation Intention; Social Presence; S-O-R framework; TAM

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The Relationship Between Perceived Parenting Styles and Emotion Regulation Among Young Adults

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Abstract— This study investigates the relationship between perceived parenting styles and emotion regulation among young adults aged 18 to 25. Using a cross-sectional correlational design and snowball sampling method, data were collected from 150 participants (98 females, 52 males) through self-report questionnaires: the Perceived Parenting Style Scale (PPSS) and the Emotion Regulation Questionnaire (ERQ). Reliability analysis showed acceptable to excellent internal consistency across the scales. Spearman's rho correlations revealed that authoritative parenting was positively associated with adaptive emotion regulation strategy—cognitive reappraisal ($\rho = .334$, $p < .001$), while authoritarian and permissive styles were more closely linked to expressive suppression, a maladaptive strategy. No significant gender or age-based differences were found in perceived parenting styles. However, the marital status of parents significantly influenced the perception of authoritative and authoritarian parenting. These findings highlight the importance of supportive parenting practices in promoting healthy emotion regulation in emerging adulthood.

Keywords— Authoritative; Authoritarian; Cognitive Reappraisal; Expressive Suppression; Permissive

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STEAM and the Textile Recycling Revolution; Towards a Sustainable Future

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Abstract— Textile Recycling as a sustainable solution, together with the STEAM methodology, represents a response to reduce climate change by contributing a sustainable solution to the Sustainable Development Goals of the 2023 Agenda.

Textile Recycling supports the reduction of climate change due to the decrease in CO2 generation as it eliminates the need to cultivate new fibers, which consequently reduces CO2 emissions into the atmosphere. It also prevents water pollution in textile processes, contributing to the solution of SDG 6 Clean Water and Sanitation. These actions together contribute to SDG 13 Climate Action, and furthermore, to SDG 12 Responsible Production and Consumption. There is a need to demonstrate efficient and successful models that can be replicated. Textile Recycling is an initiative carried out from an educational institution, which also contributes to SDG 4 Quality Education, due to the comprehensive training intended for students and the sharing of the successful case of creating new garments through the recycling of used clothes by the creative process of students in the Design Degree (UAM Azc.).

The project uses the STEAM methodology, which facilitates the inclusion of different disciplines to achieve an innovative and sustainable solution. It is worth highlighting that the products created are an example of the application of Art in a product or innovation, aiming to promote this type of integrative and sustainable productions in order to reduce the main global problems by reusing materials and contributing to the SDGs.

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Developing Sustainable Solutions and AI Competencies in Future Students through Maker-STEAM Educational Frameworks

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Abstract— In the digital age, education must respond to the challenge of training students capable of developing sustainable technological solutions. This research, a collaborative effort of educators, researchers, and students, proposes an innovative approach, integrating STEAM-PBL methodologies and Maker-DIY spaces as catalysts for developing skills in artificial intelligence (AI) and educational robotics, aligned with the Sustainable Development Goals (SDGs). An educational intervention was implemented with high school students using the PBL (Project-Based Learning) model in Maker environments. These spaces featured tools such as Arduino, 3D printers, laser cutters, reusable materials, and open-source software. Students collaborated on the design of robotic prototypes focused on repetitive tasks optimized using basic AI. The students showed significant progress in computational thinking, collaborative work, robotic, and AI-oriented programming. The developed products demonstrated technical innovation with a social and ecological purpose. Recognition was received in national and international robotics competitions, validating the effectiveness of the pedagogical approach. This experience demonstrates that Maker-STEAM environments not only foster 21st-century skills but also enable the early integration of AI into the classroom from a practical, creative, and sustainable perspective. SDG-oriented educational robotics is consolidating as a powerful tool for transforming education toward a more inclusive and technologically relevant model.

Keywords— STEAM Education, Project-Based Learning (PBL), Maker Spaces, DIY Education, Artificial Intelligence (AI), Educational Robotics, Sustainable Development Goals (SDGs), Technological Innovation, Sustainable Education

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AI enabled Innovative Approach to Integrate Testing for Tensor Flow Models

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Abstract— As artificial intelligence (AI) systems continue to grow in complexity, the need for reliable machine learning models has become increasingly critical. This study introduces a new approach to integration testing specifically tailored to Tensor Flow, a widely used framework in AI development. Our methodology is designed to assess both functional and performance aspects of TensorFlow models, addressing challenges unique to AI systems. Through the development of automated testing suites for Tensor Flow, our framework enables seamless evaluation of model components and their interactions. Experimental results demonstrate the effectiveness of our approach in identifying integration issues and improving the stability and robustness of AI applications. These findings indicate that the proposed framework enhances model deployment accuracy and streamlines the development cycle. Our work provides a structured approach to integration testing within the TensorFlow ecosystem, contributing to the advancement of dependable AI systems.

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Financial Literacy among the Philippine National Police Force

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Abstract— Financial literacy encompasses a range of information and skills that individuals need to make informed financial decisions, including managing debt, borrowing, investing, saving, and creating a budget. The research used quantitative methods. This study focused on the financial literacy of PNP personnel in Dagupan City, examining how irregular income and high-stress conditions impacted their financial decision-making and work schedules. The research emphasized that financial literacy is crucial not only for a police officer's personal life but also for their work performance, morale, and community relations. Using a mixed-methods approach, the study collected data through surveys and interviews with PNP personnel. Findings revealed a significant lack of financial management skills attributed to the absence of formal finance education in PNP training curricula and the demanding nature of police work. Recommendations emphasized the need to integrate financial literacy programs into PNP training to address these gaps. The researchers used survey information and interpretation, combining quantitative analysis of survey data with qualitative insights from interviews, focus groups, and case studies. The study found that mid-level officers, particularly Police Staff Sergeants (PSSG), were the most engaged participants, suggesting that officers with extended financial responsibilities are more likely to seek financial education. While some officers demonstrated adequate financial knowledge, most struggled with budgeting, saving, and investing. The study suggests that comprehensive financial education can be achieved through continuous literacy programs and collaboration with financial institutions to bridge this gap. The purpose is to guide future financial literacy programs for military officers, benefiting individuals, their families, coworkers, and the community.

Keywords— Financial literacy, Philippine National Police (PNP), Investment behavior

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Investigating the Role of Internal Control Mechanisms on Revenue Collection in Tanzanian Local Government Authorities (LGAs)

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Abstract— This study investigates how internal control mechanisms influence revenue collection in Tanzanian LGAs, focusing on Monitoring of Control (MOC), Financial Management Information System (FMIS), and Information-Communication (INFC), and guided by COSO Framework, agency theory, and Resource-Based View (RBV). A total of 358 responses from finance and accounting officers in the selected LGAs were analyzed using PLS-SEM approach. Findings reveal that FMIS and INFC have strong, positive, and statistically significant direct effects on revenue collection, emphasizing their role as critical enablers of financial performance. MOC, however, showed no direct influence on revenue collection but significantly enhanced both FMIS and INFC, which in turn mediated its impact. This suggests that MOC's effectiveness is realized through its ability to strengthen operational systems rather than through direct revenue outcomes. Interestingly, the moderating role of INFC between MOC and revenue collection was found to be insignificant, implying weak interaction effects in this relationship. From a practical perspective, the results imply that LGAs need to invest in more capacity-building, digital systems, and continuous monitoring to improve revenue collection. Hence, this study recommends that LGAs need to strengthen the implementation strategies, integrate their systems further, and direct internal controls to policy implementation to foster sustainable revenue management.

Keywords— Local Government Authorities (LGAs), Revenue Collection, Internal Control Mechanisms, Financial System, Tanzania

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Bridging Policy and Practice: A Quantitative Analysis of Sustainable Sports Participation and Institutional Implementation in Higher Education in Sichuan, China

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Abstract— Teacher training effectiveness in vocational colleges is increasingly recognised as a key driver of sustainable educational outcomes and workforce readiness. This study explores the impact of institutional management factors on the perceived training effectiveness of vocational college teachers in Jiangsu Province, China. Using a quantitative design, data were collected from 412 teachers through a structured questionnaire comprising dimensions of training needs assessment, administrative support, relevance of training content, perceived training effectiveness and post-training evaluation. Descriptive statistics, Pearson correlation, and multiple regression analysis were used to examine the relationships among these variables. Results indicate that administrative support ($\beta = .384$, $p < .001$), relevance of training content ($\beta = .356$, $p < .001$), and post-training evaluation ($\beta = .297$, $p < .01$) significantly predict perceived training effectiveness. The regression model accounted for 51.4% of the variance ($R^2 = 0.514$, $F(4, 407) = 107.32$, $p < .001$). Teachers also reported that misalignment between training content and job requirements, as well as insufficient managerial feedback mechanisms, reduces long-term effectiveness. The findings underscore the importance of strategic, management-led approaches to training design and implementation in vocational education settings. Recommendations are provided to enhance sustainable teaching performance through integrated training policies, feedback loops, and management engagement. This study contributes to the discourse on workforce-oriented education reform and offers evidence-based insights for education managers and policymakers in vocational training institutions.

Keywords— Administrative Support, Post-Training Evaluation, Training Content, Training Effectiveness, Training Needs

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Pavement Design using Recycled Plastic Waste

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Abstract— Escalating plastic waste generation is intensifying environmental problems. Concurrently, the need for durable, sustainable, and cost-effective road infrastructure is growing. This study investigates the feasibility of utilizing recycled plastic waste—specifically shredded Polyethylene Terephthalate (PET) and High-Density Polyethylene (HDPE)—as modifiers in flexible pavement design.

Lab-based evaluations were performed to study the behavior of bituminous mixtures. modified with varying percentages of plastic waste (0%, 4%, 6%, 8%, and 10%). The performance parameters evaluated included Marshall Stability, flow value, moisture susceptibility, and rutting resistance. Results indicate that plastic-modified bitumen, particularly with 6–8% plastic content, exhibits enhanced stability, Decreased moisture uptake and greater durability against deformation and water-induced harm.

The study demonstrates the dual benefits of plastic waste integration: improved pavement performance and significant environmental gains through waste reuse. Recommendations are provided for practical field implementation and policy development to support the sustainable adoption of this technology in road construction.

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Winter Air Quality Challenges in Urban Cold Climates: Policy Benchmarking and Implementation Insights for CAMCA

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Abstract— Severe winter air pollution remains a critical challenge in cold-climate urban regions, where domestic heating, stagnant weather conditions, and limited regulatory capacity combine to degrade air quality. This study conducts a cross-national benchmarking analysis of air pollution policy implementation across 13 cold-climate countries—including the U.S., Canada, Germany, Finland, Poland, China, Korea and Japan—to identify effective legal, institutional, and governance practices for managing winter-specific air quality issues. The objective is to derive actionable insights for countries in the Central Asia, Mongolia, and Caucasus (CAMCA) region, where urban air quality challenges are acute but policy responses remain underdeveloped.

Using a mixed-methods approach that combines legal review, policy evaluation, and governance indicators, the study assesses how high-performing countries operationalize air pollution control through statutory mandates, performance-based regulatory cycles, enforcement mechanisms, and public participation. A policy implementation framework is applied to selected CAMCA urban centers to evaluate current practices and identify institutional and legal gaps.

Results show that effective winter air quality governance relies on integrated planning, science-based monitoring, inter-sectoral coordination, and strong public accountability. In contrast, CAMCA countries often face fragmented responsibilities, weak enforcement, and limited use of real-time data in decision-making. The paper concludes by proposing a policy benchmarking model and reform roadmap tailored to CAMCA's urban governance context, aiming to support the development of adaptive, health-protective air quality systems in cold-climate developing regions.

Keywords— Winter Air Pollution, CAMCA Region, Mongolia, Central Asia, Air Quality Governance, Environmental Policy, Public Policy, Public Participation, Public-Private Partnership, New Public Governance, New Public Management

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Evaluating Education-Driven Approaches to Promote Sustainable Consumption in University Sports Facilities: Evidence from a Discrete Choice Experiment

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Abstract— While university sports venues meet the needs of teaching and training, they are also key areas of energy consumption and resource waste on campus. Existing research has mostly focused on policy, resource, or technological improvements, with insufficient attention paid to the role of education in sustainable consumption. Addressing this research gap, this study aims to evaluate the effectiveness of education-driven strategies in promoting sustainable consumption in university sports venues and identify the optimal strategy combination. This study utilizes a discrete choice experiment (DCE) with university sports venue users, ensuring diversity in both participant identity and frequency of use. The sample size is expected to be 200–250 participants, with each participant completing 8–10 sets of scenario-based multiple-choice questions, encompassing five strategies. The questionnaire was generated using an orthogonal design. A mixed logit model was used to estimate the marginal utility and relative importance of each attribute level. Scenario simulations were used to predict the probability of acceptance of different strategy combinations, and differences were compared across different groups. The study estimates that educational information has a significant impact across all strategies, with "social norms reminders" and "operational guidance" performing best in increasing the selection rate of sustainable consumption options. These strategies also exhibit significant synergistic effects when combined with incentive mechanisms. This study attempts to provide low-cost, replicable strategic priority recommendations for university sports management departments, expand the intersection of sports management and sustainable development research, and provide empirical support for the integration of SDG 4 and SDG 12.

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How Olympic Values Are Enacted in PE Teacher Education: A Multi-Stakeholder Perspective from Faculty and Pre-Service Teachers

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Abstract— Olympic Values—fairness, respect, and diversity—are widely recognized but remain insufficiently implemented in higher education PE teacher training. Existing research focuses on theoretical advocacy and school practice, offering little empirical insight into how these values are embedded in teacher education, or into the perspectives of different stakeholders. This study investigates how Olympic Values are operationalized in PE teacher education, drawing on the views of pre-service teachers and teaching staff. Using a qualitatively driven mixed-methods approach, it analyzes core course syllabi from three to five universities and conducts semi-structured interviews with six to eight pre-service teachers and four to six instructors. Results show shared recognition of the values' importance but divergent understandings: students link them mainly to competitive sport, while teachers emphasize equity and diversity. Syllabi often relegate these values to introductory sections, lacking integration into objectives and assessments. Key barriers include limited resources, absence of contextualized cases, and misaligned evaluation systems. The study recommends building a contextualized case library, embedding value indicators into objectives and assessments, incorporating them into microteaching and practicum, and establishing departmental mechanisms for resource sharing and faculty development. These findings provide practical pathways for curriculum reform, program accreditation, and advancing SDGs 4, 5, and 10.

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The Impact of Integrated Value Education on the Effectiveness of Physical Education Courses: A Comparative Study on Students' Ideological and Political Literacy, Physical Health and Course Satisfaction

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Abstract— While effectively promoting students' physical health, physical education is also a key area for cultivating students' ideological and political literacy and values on campus. Existing research primarily focuses on the single physical benefits of physical education, with insufficient attention paid to the role of value-integrated physical education in students' holistic development. In particular, there is a lack of systematic quantitative evaluation of the synergistic effects of value-integrated physical education curriculum on physical and non-physical outcomes. Addressing this research gap, this study aimed to evaluate the effectiveness of value-integrated physical education in promoting students' holistic development and identify key moderating factors for optimizing its implementation.

This study employed a non-equal-group pre-post-test design. The subjects included male and female university students from diverse academic backgrounds, ensuring diversity in demographic characteristics and physical education participation levels. The sample size consisted of 350 participants: an experimental group (n = 160) received value-integrated physical education instruction, while a control group (n = 190) participated in regular physical education courses. The intervention period lasted one semester. Data were collected using standardized scales and objective assessments covering five dimensions: ideological and political literacy, course satisfaction, teacher teaching ability, course design quality, and student classroom engagement. Physical health was assessed using the National Student Physical Health Standards. Pre- and post-implementation measurements were conducted, and data were analyzed using paired-sample t-tests, analysis of covariance, and multiple regression models to estimate the marginal effects and relative importance of different factors.

The study found that values integration had a significant positive impact across all outcomes, with ideological and political literacy showing the most significant improvement in the experimental group ($p < .001$). Importantly, this integration did not negatively impact traditional physical education objectives, with both groups showing comparable gains in physical health indicators ($p > .05$). The experimental group also demonstrated significantly higher course satisfaction ($p < .01$), indicating increased student engagement. Regression analysis revealed a significant synergistic effect when combining teacher teaching ability and student classroom engagement, indicating optimal conditions for successful implementation.

This study theoretically fills a gap in empirical research on the effectiveness of values-integrated physical education in higher education settings. Methodologically, it establishes a robust quasi-experimental framework for evaluating complex educational interventions with multiple outcome measures. Practically, it provides evidence-based recommendations for physical education curriculum designers and administrators seeking to promote the holistic development of students. The significance of this study lies in expanding the intersection of physical education pedagogy and moral education research and providing empirical support for the localized implementation of SDG 4 (quality education).

Keywords— Value Integration; Physical Education; Ideological and Political Literacy; Quasi-Experimental Design; Holistic Development; Higher Education

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Quadratic Modeling in Technology-Enhanced Learning: Applications, Instructional Methods, and Pedagogical Insights

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Abstract— Quadratic models play a vital role in informatics education by enhancing students' critical thinking, problem-solving abilities, and analytical skills. These mathematical models, which utilize quadratic functions, are commonly applied in various fields such as economics, engineering, and computer science to address real-world challenges. This paper examines the integration of quadratic modeling in informatics education, focusing on its practical applications and effective teaching methodologies. It explores the use of quadratic equations in computational problems, simulations, and data analysis, highlighting both the advantages and challenges of incorporating these models into the curriculum. The paper also proposes strategies to improve student engagement and understanding, combining theoretical concepts with hands-on practice and technological tools. Through case studies, this research emphasizes the importance of blending mathematical literacy with technical expertise in the contemporary informatics curriculum, helping students bridge the gap between abstract theory and practical application. In doing so, it advocates for the continued relevance of mathematical concepts like quadratic modeling in shaping well-rounded, capable informatics professionals.

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Effect of Residual Stress on Creep Behavior in Composite Disc with Variable Thickness

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Abstract— The objective of this present study is to investigate the effect of thermal residual stresses on the plastic stress distributions and the resulting creep deformation of the rotating isotropic disc made of functionally graded material disc with linear thickness. In the isotropic FGM disc with thermal gradients, the content of silicon carbide particles decreases linearly from the inner radius to the outer radius of the disc. The creep behavior of the composite disc rotating at 15,000 rpm has been described by Sherby's law. The creep parameters of the isotropic FGM disc vary along the radial distance due to varying composition. The creep behavior of isotropic disc is expressed by a threshold stress with value of stress exponent as 8. It is observed that the presence of thermal residual stresses in isotropic FGM disc with linear thickness needs attention for an optimal design a disc.

Keywords— Modeling, Composites, Steady state creep, Residual Stress

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Domination Number of Double Graph of Some Graphs

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Abstract— A graph is an ordered pair (V, E), where V is the set of vertices of G and E is the set of edges of G. A set of Vertices D in a graph G dominates G, if every vertex in G is either in D or adjacent to a vertex in D. A cardinality of any smallest dominating set is called domination number of G denoted by $\gamma(G)$. In this paper we computed the domination number of double graph of the Queen's graph, the Lilly graph, the Ladder graph, the Ladder rung graph and the Triangular belt graph.

Keywords— Dominating Set, Double Graphs, Queen Graph, Lilly Graph, Ladder Graph

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Evaluation And Usability Of Sustainable Materials Such As Geopolymers, Bamboo And Timber in Turkish Structural Engineering

Mahmud Mohammed Abdulkadir

Abstract— The construction industry significantly contributes to global environmental degradation, mainly because it uses materials that are high in carbon content, such as ordinary Portland cement (OPC) and steel. In earthquake-prone regions like Turkey, where structural resilience is a very important criteria to consider, achieving an integration of sustainable materials into engineering practice is both urgent and complex.

This evaluation looks at how well three alternative materials perform structurally, in an environmentally impactful way, and when subjected to seismic forces. These materials include Geopolymer Concrete (GPC), Engineered Timber (specifically, Cross-Laminated Timber and Glulam), and Bamboo Composites. Using mixed-method study, and combining experimental data, compliance analysis, and surveys from stakeholders, these materials are assessed against the Turkish Building Earthquake Code (TBEC-2018).

The research shows that all three materials exhibit competitive structural behavior and offer clear environmental advantages in cutting down embodied carbon and adapting to Turkey's diverse seismic zones. Rregulatory uncertainty, supply chain limitations, and a lack of trained professionals are major obstacles to the widespread adoption of these materials. The study ends with a set of strategic recommendations aimed at integrating these alternative materials into the TBEC, developing local supply chains, and providing an efficient and professional training program for architects and engineers to use these materials.

Keywords— Bamboo, Engineered Timber, Geopolymer Concrete, Seismic Design, Sustainable Materials, Turkey

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Hierarchical Classroom Dynamics in Thailand: Ajarn and Kreng Jai

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Abstract— This study explores inclusive leadership practices in a Thai higher education institution (HEI), addressing challenges posed by hierarchical classroom dynamics rooted in cultural norms. The reverence for the '*Ajarn*' (faculty authority) and for '*kreng jai*' (deference to avoid inconvenience) often hinder student engagement and intellectual risk-taking. Through a qualitative approach, including literature review and semi-structured interviews with educators, the study identifies systemic barriers such as answerability culture and Western pedagogical clashes with Thai values. Three key growth areas are proposed: (1) balancing Ajarn authority with student agency using hybrid leadership models, e.g., Wheatley & Frieze's host leadership; (2) adapting Western inclusive practices to Thai cultural logic through co-designed frameworks; and (3) measuring belonging via a '*Silent Participation Index*' to track non-verbal engagement. Findings reveal that kreng jai can be reinterpreted as relational currency to foster participation, while AI presents both a threat to traditional roles and a tool for equitable knowledge access. The study advocates for culturally responsive leadership, community cultural wealth, and host leadership to transform hierarchies into permeable structures. Practical strategies include power audits, brave spaces protocols, and equity-focused assessments. Challenges include resistance from conservative faculty and the need to balance urgency with cultural sensitivity. Ultimately, the research underscores that inclusive leadership in Thai HEIs must honor cultural roots while innovating to empower all stakeholders.

Keywords— Inclusive Leadership, Higher Education Institutions (HEI), Ajarn, Kreng Jai, Culturally Responsive Leadership; Community Cultural Wealth, Host Leadership

I. Introduction

This study focuses on instructional, inclusive leadership practices at a large private Higher Education Institution (HEI) in Thailand and addresses the challenges of hierarchical classroom dynamics, prevalent in the Thai education system, which hinders engagement and belonging of students. To understand the dynamics in the Thai education system, some cultural knowledge is essential. A study among 432 school administrators in public universities in Thailand revealed that the most important dimension of responsible leadership of administrators was answerability, while the lowest was responsibility [1]. Similarly, recognition and rewards were more important for effective teamwork than leadership support, and school effectiveness was scored for competition rather than for creativity. Socially responsible leadership in Thai universities is often practiced in assimilation to Western countries' contexts [2]. Since the Thai society characteristically has a bureaucratic structure, reforms and their governance are usually determined by senior bureaucrats cherishing governance values from Western developed countries [2]. However, due to nationalist point of views in universities, teaching is about keeping the status quo rather than embracing conceptual changes [3]. This is partly due to Thailand never having been colonized which led to a perception of Thai exceptionalism [4].

In Thai universities, 'Ajarn' is a title of respect given to university lecturers and professors and is used to show deference, especially in academic and Buddhist contexts. It also signifies a high social standing and expertise, and carries cultural weight in the Thai social context [3, 5]. Ajarns often hold substantial influence over curriculum development and student assessment. In some cases, their seniority can create rigid hierarchies, sometimes limiting innovation or the input of younger faculty. An ongoing debate is how to balance traditional respect for Ajarns with the need for more egalitarian, merit-based academic cultures as seen in Western systems [5]. However, and identified as a gap, there is little to no literature and research about these hierarchical classroom dynamics, stemming from the cultural limitations of Ajarn and Krang Jai.

The objective of this study is the transformation of rigid teacher-student hierarchies at the HEI to foster engagement and belonging, by addressing the two-faced challenge of (1) over-reliance on the 'Ajarn' authority, limiting student voices [5], and (2) student restraints in intellectual risk-taking and creativity [1]. This requires building a system that respects the cultural identity of faculty, but also fosters

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open-door policies for students [6]. Educational leaders in higher education need to challenge existing norms, excluding stakeholders, such as students, while students themselves need to overcome tensions that restrict them from speaking out and offering their opinions.

II. Literature Review

Leadership Perspective

The researcher's perspective is situated at the crossroads of cross-cultural entrepreneurship and Thai academic hierarchies, creating a unique leadership lens. 25 years of entrepreneurship, working with diverse employees and teams in Germany, led to realize that inclusion requires deliberate trust-building, a lesson equally relevant to Thai classroom dynamics. German directness has to bridge Thai pedagogical power gaps. Leadership insights and hard-won knowledge in business align with Khalifa's (2018) culturally responsive leadership: systems can only change when stakeholders feel safe to challenge norms.

One of the leadership beliefs about Thailand includes the concept of Thai exceptionalism (Wikipedia contributors, 2025a), which asks for solutions that honor cultural roots while nurturing student agency, not Western imports or Thai static traditions. In this context, the 'Is it wrong, Ajarn?' turning moment in year 1 of the researcher's educational journey was when a student reframed curiosity in their way of solution-finding as correction-seeking. This led to recognize how hierarchy restrains intellectual risk-taking, similar to Mahapoonyanont et al.'s [1] findings on Thailand's answerability culture, suppressing creativity. Using Why? questions since then, e.g., 'help me understand your thinking', helped start a more conversational or exploratory dialogue with students.

Kreng Jai

As an additional influencing factor in hierarchical classroom settings, the Thai concept of kreng jai is a double-edged sword. Kreng jai influences interactions and relationships, particularly in academic settings [7]. It reflects a deep-rooted consideration for others, aiming to avoid causing inconvenience, discomfort, or embarrassment. In a classroom setting, this can manifest in hesitating to offer an opinion, to ask questions, or to seek help, especially from those in positions of authority or seniority, like Ajarns, thus aggravating classroom hierarchy dynamics. These tensions influence educators' often careful and respectful disruption strategies with student interactions: trying to preserve the Ajarn dignity while gradually decentralizing power, e.g., have students co-design rubrics [8]. Following Campbell Jones et al.'s [9] brave spaces, where respect is not silence, but engagement, where all voices contribute, kreng jai has to be taught as social or relational 'currency', where sharing ideas is not just permitted but seen as a respectful and valued contribution to the collective classroom. Thus, kreng jai shifts from deference to active participation, where students -exercising kreng jai through participation- leverage familial and social capital [8], strengthening both individual and communal outcomes.

Three major opportunities to grow in an educational leadership journey in Thailand

(1) To navigate power decentralization, the challenge will be to balance Ajarn authority with student agency without provoking resistance, mainly in conservative Ajarns themselves [5].

Growth goal: Development of hybrid leadership strategies that honor hierarchy on the one hand while creating space for student voices on the other hand, drawing on Wheatley & Frieze's host leadership model [10].

(2) Cross-cultural facilitation requires to translate Western inclusive practices, e.g., Khalifa's culturally responsive leadership [6] into Thai cultural logic.

Growth goal: Joint faculty (Thai and non-Thai) co-design a democratic Thai classroom framework that blends kreng jai with participation norms and rubrics.

(3) The challenge to measure belonging means to quantify shifts in student engagement within the university's hierarchical constraints [1].

Growth Goal: Create an index that tracks non-verbal engagement, labeled as 'Silent Participation Index'. This can include chat contributions, anonymous polls and others.

Local Thai Insights

Firstly, cultural values -as mentioned before- impact inclusivity. Hierarchy is sacred, as the role of the Ajarn blends a monastic and academic reverence [3], leading to students withholding ideas to avoid disrupting the teacher's moral authority. In addition, kreng jai as a social construct -the avoidance of burdening others [7]- manifests in traditionally educated students hesitating to ask for help and female students potentially downplaying achievements to avoid standing out.

In addition, historical and regional factors also play a hindering role in inclusivity. Thailand's avoidance of colonization [11] might foster a certain resistance to foreign pedagogies [2], whereas the prevalent pride in Thai business

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models, e.g., farmers' cooperatives (Sahakorn), does not enter entrepreneurship curricula. Buddhist economics and their concepts, e.g., the sufficiency economy, as instilled by the former King of Thailand, Bhumibol Adulyadej, frame success differently from Western high growth perspectives [12].

Thailand's location in the middle of ASEAN, offers the opportunity to use localized case studies of ventures that are rarely featured in textbooks. In addition, the university's urban location creates a Bangkok-centric bias, and privileges students with prior exposure to international schools and business concepts and those who come from a family setting in formal economies.

Systemic Context

The university's hierarchical dynamics stem from senior faculty's content-focused leadership [5] and its international university partnerships, which promote Western-style project-based learning (PBL). While valuable, this approach clashes with Asian students' preference for structured, authority-guided learning [5] and marginalizes local models like Asian family businesses which rely on social capital rather than disruptive innovation [13]. Global partnerships further privilege internationally-connected students, while Western assessment rubrics overlook Thai strengths like relationship-building. Language barriers, e.g., US business jargon, and neglect for Thai-Chinese business concepts blend with these inequities. While PBL aims to foster creativity, its student-driven approach might create conflicts for Ajarns with expectations of teacher-as-primary-knowledge-source [1]. On the other hand, students might be hesitant to publicly critique peers' ideas [7]. As Khalifa [6] suggests, the solution is not to eliminate hierarchy but to create hierarchies that listen.

III. Motivation and Objective

To grow inclusive leadership in Thai HEI, educators need to understand the hierarchical classroom dynamics, which limit students' belonging and ultimately affect their learning outcomes. Unfortunately, this is a two-sided coin, as both the educator's role (the Ajarn) and the students' cultural roots (kreng jai) limit inclusive leadership education. There are three major opportunities to grow in an educational leadership journey in Thailand.

(1) To navigate power decentralization, the challenge will be to balance Ajarn authority with student agency without provoking resistance, mainly in conservative Ajarns themselves [5]. Growth objective here is the development of hybrid leadership strategies that honor hierarchy on the one hand while creating space for student voices on the other hand, drawing on Wheatley & Frieze's [10] host leadership model.

(2) Cross-cultural facilitation requires to translate Western inclusive practices, e.g., Khalifa's culturally responsive leadership [6] into Thai cultural logic. Growth objective here is that joint faculty (Thai and non-Thai) co-design a democratic Thai classroom framework that blends kreng jai with participation norms and rubrics.

(3) The challenge to measure belonging means to quantify shifts in student engagement within the HEI's hierarchical constraints [1]. Growth objective is the creation of an index that tracks non-verbal engagement, maybe labeled as 'Silent Participation Index". This can include chat contributions, anonymous polls and others.

IV. Methods and Methodology

For additional insights, two semi-structured interviews with educators at the Thai university took place to deepen the understanding of Thai hierarchical classroom dynamics. For best reference purposes, one male, one female, one of them Thai, one of them non-Thai, were chosen for the interviews. Participants were selected for their years of educational experience, diversity in their perspectives, different gender and their experiences in international university programs in Thailand, stemming from the observed private HEI. Their informed consent was obtained, and confidentiality maintained by anonymizing the answers.

Potential biases are the small sample size of two respondents and the potential influence of the researcher's perspective in the interview.

The first educator (male, age 55, non-Thai, long teaching experience and also an entrepreneur, with previous teaching experience in a public Thai university) highlighted the importance of reflection journals to create awareness of the problem to raise consciousness levels. He agreed with the assessment of the hierarchical classroom dynamics and their resulting problems. For the Ajarn hero leadership, he pointed out that the problem will increase in the future, as Ajarns will face competition with AI tutors or AI professors within the next 5 years, where students might make choices against them. For these increasing competitive dynamics due to AI, the problem needs to be targeted immediately. His suggestion was to acknowledge kreng jai and evolve teaching and practices around it. He suggested to use recordings with AI instead of an index to measure student engagement, because then students'

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interactions are recorded and transcribed to capture more indirect measures. In addition to losing face for students, he created awareness that also Ajarns, especially those with lower and local qualifications, might lose face when a student asks a questions, and they don't have an answer. In this case, this Ajarns might use social privilege control to not answer and to not lose face. The interviewee also mentioned Hofstede's intercultural management assessment which measures Thailand as a feminine, hierarchical, group- and long term-oriented society, quite different from US and European societies [14].

The second educator (female, age 40, Thai, teaching in international and Thai programs) points out that '"trust," "relationship," and "respect" are essential for effective hybrid leadership between Ajarns and students. Trust creates a safe environment where students can develop entrepreneurial skills and leadership. Relationships help students share their struggles, even if "kreng jai" makes it difficult. Mutual respect follows—students value our guidance, and we appreciate their growth as individuals and entrepreneurs'. Classroom dynamics differ. For example, when students are mentored for their business venture, they are not afraid to ask for any assistance related to their businesses. However, when it comes to team-dynamic problems, they are afraid to speak out and ask on their subjects. Many Thai students also live '"kreng jai" towards teammates, which hinders effective teamwork'. The Ajarn's role is to foster a safe environment where students can develop ownership, assert their rights, and build mutual respect for better collaboration. The idea of joint faculty (Thai and non-Thai), co-designing a democratic Thai classroom framework, is promising as joint lectures or cross-activities can broaden perspectives, foster collaboration, and encourage participation in events like hackathons and business case competitions, but is limited by resources and cooperation. Students from Thai and international programs differ greatly in nature and characteristics, so applying such frameworks will have to vary by course, class size, and student year. From her experience, she suggests to track and evaluate both non-verbal and verbal student's engagement at events, e.g., energy levels, body language, by gathering feedback from guest speakers. Finally, she concluded 'I am fully in support of the 'Silent Participation Index''.

V. Results

Personal Reflection on Systemic Challenges and Educator Input

The systemic analysis and colleague consultations revealed both complexity and urgency of transforming Thai HEI's hierarchies. The non-Thai educator's warning about AI disrupting traditional Ajarn authority underscores that cultural preservation alone is not sufficient, and rather a proactive adjustment is necessary. His observations on kreng jai in relation to faculty feeling embarrassed when unprepared were an enlightening insight. It exposed how hierarchies protect not just power but also personal vulnerabilities. This aligns with Mahapoonyanont et al.'s findings on Thailand's answerability culture, where avoiding embarrassment hinders growth [1]. However, his AI-driven measurement idea, while pragmatic, raises ethical questions about surveillance versus empowerment, possibly leading to refinement of the 'Silent Participation Index' as a student-owned tool rather than a faculty-monitored one.

The Thai educator's emphasis on trust as the bridge between kreng jai and participation also impacts the inclusive leadership approach. Her observation that students openly discuss business ventures but avoid team conflicts shows how hierarchy operates situation-driven: deference decreases when students perceive tangible assets = their businesses, but increases or pops up in interpersonal dynamics. This mirrors Yosso's concept of navigational capital, where students selectively engage based on perceived safety [8]. Her support for the index validated its design, while her caution about program differences (Thai vs. Inter) reminded us that inclusivity cannot be one-size-fits-all and that the leadership approach will have to be two-fold as well.

Key take-aways for an inclusive leadership approach are (1) To view AI as both threat and tool. While AI may disrupt Ajarns' roles, it can also equalize access to knowledge if it is integrated thoughtfully, maybe through AI-assisted mentorship; (2) Kreng jai, like a double-edged sword, should transform from silencing students to enabling respectful dialogue, as both colleagues suggested.; and (3) Trust comes first, before risk-taking: As the Thai educator noted, students need relational safety to challenge both peers and faculty, a prerequisite for PBL success in this context.

Moving forward, these insights will have to be balanced, leading to co-designing AI guidelines with students for transparency, addressing the non-Thai educator's concerns. This also means to incorporate conflict-safe team exercises, as suggested by the Thai educator, to practice and reach constructive arguments. This process follows Khalifa's statement that inclusive leadership

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requires contextual courage [6], the willingness to name disagreements, e.g., Western PBL vs. Thai social capital, which leads to experiments with hybrid solutions. Both educators' input did more than just inform the growth plans in this study; they exposed own blind spots, partially due to limited knowledge, particularly in assuming that kreng jai might be solely a student barrier, not also a hindering factor for Ajarns. True transformation demands humility to recognize how hierarchy shapes all of us.

VI. Discussion

Growth Areas Using Inclusive Leadership Frameworks

This study focuses on Thai hierarchical classroom dynamics, where traditional teacher-student hierarchies hinder student engagement and belonging. To address this challenge, three inclusive leadership frameworks can be applied:

(1) Culturally Responsive Leadership [6], Community Cultural Wealth [8], and Host Leadership [10]. All frameworks address systemic challenges while taking existing cultural assets into account for inclusive solutions.

Culturally Responsive Leadership [6]

With regard to the studied growth areas, strengths of the application of Khalifa's culturally responsive leadership are that the deeply embedded respect for the Ajarn role in Thai culture can be reframed from a barrier to a foundation for trust. This aligns with the Thai HEI's mission to blend global entrepreneurship education with local values [6].

One systemic challenge addressed is critical self-reflection, as faculty must examine how their leadership practices reinforce hierarchy (the 'Is it wrong, Ajarn?' moment) and how they adopt conversational dialogue (the 'Why?' questions). This creates a more inclusive environment as it shifts from hero authority to a listening hierarchy by integrating student voices in the curriculum, e.g., through co-creating rubrics. It contributes to the growth areas also through community engagement, as it includes the international and diverse student body of Thai, Asian and international students in co-designing participation norms.

Existing assets are leveraged as the cultural reverence for Ajarns is used to demonstrate an open-door policy, where authority becomes facilitator rather than dictator. It also translates Western practices, such as PBL, into Thai cultural logic by re-inventing critique as a kreng jai-respectful contribution.

Community Cultural Wealth [8]

One strength of Yosso's application of community cultural wealth to the growth areas is that Thai students' familial and social capital, e.g., their family business backgrounds, is able to enrich classroom discussions, and kreng jai as consideration for others can be reimagined as relational currency to foster collaborative learning [8].

Systemic challenges addressed are navigational capital and resistant capital. For students from rural or non-international school backgrounds who may lack exposure to Western business jargon, Yosso's cultural community wealth validates their localized and heritage knowledge, for example the Thai-Chinese business practices (systemic challenge navigational capital) [8, 13]. Resistant capital is addressed as students are encouraged to share ideas because participation is transformed to an act of respect, e.g., through failure reflection journals.

To leverage assets, Thai entrepreneurial models, such as the farmers' or the weaving cooperatives, should be incorporated into the curriculum to bridge Western and local examples. In addition, anonymous tools, e.g., the 'Silent Participation Index', can be used to capture voices of hesitant students.

Host Leadership [10]

One practical application to the growth areas with Wheatley and Frieze's host leadership framework is the transformation of the Ajarns' traditional roles to hosts of knowledge, changing them to facilitators of student-led learning outcomes, taking the HEI's entrepreneurial ethos into account, and aligning it with agile leadership and the capacity to adjust and respond to change [10].

Systemic challenges are targeted to decentralize power by replacing rigid hierarchies with brave spaces [9], where Ajarns and students co-design solutions, e.g., the suggested peer shadowing, and to measure belonging by developing metrics like heat maps to track participation disparities by gender and/or nationality.

To leverage assets, partnerships with international universities can be used to pilot joint or hybrid pedagogies that honor Thai and Asian values, e.g., the sufficiency economy, while fostering creativity. In addition, regular faculty reflection circles can help normalize discussions about the effects of hierarchy on vulnerability.

Connection to Additional Inclusive Leadership Concepts

The classroom's hierarchical dynamics can benefit from additional concepts, such as humanizing practices,

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liberatory education, continuous improvement, and community partnerships, expanding on the frameworks of Culturally Responsive Leadership [6], Community Cultural Wealth [8], and Hero-to-Host Leadership [10].

Humanizing practices align with Khalifa [6] and Yosso [8] by valuing Thai students' familial/social capital as pedagogical assets, e.g., local case studies, and Ajarn reflection circles. They also respond to deficit thinking [5] and shift Ajarns from authorities to co-learners. Liberatory education ties to Freire [15] and Khalifa [6] and challenges hierarchies through critical consciousness, reframing kreng jai as respectful disagreement through brave spaces [9]. It also addresses Thai exceptionalism [2] through dialogue. Continuous improvement leverages Yosso's navigational capital [8] and Wheatley & Frieze's adaptive leadership [10]. It is also emphasized by the use of equity audits [16] and the 'Silent Participation Index' to track disparities. Finally, community partnerships build on Khalifa's community-driven goals [6] and Gaventa's spectrum of ownership [17] by co-leading initiatives, e.g., Thai Buddhist economics in curricula [18].

Together, these concepts ensure that Thai culture is honored while transforming hierarchies to become more inclusive.

Proposed Leadership Strategies

The project to change HEIs' hierarchical classroom dynamics requires to address three key elements:

(1) Apply culturally responsive leadership [6] to reframe Ajarn authority from top-down control to facilitation by honoring Thai cultural respect while creating space for student voices. By aligning leadership practices with local values, hierarchy transforms to inclusivity.

(2) Implement host leadership [10] through peer shadowing and shared decision-making. This shifts Ajarns from authorities to hosts of collaborative learning, thus fostering trust and redistributing power without undermining cultural reverence.

(3) Utilize community cultural wealth [8] to value local knowledge systems. This strengthens Thai students' familial, social, and navigational capital, e.g., their family business knowledge, as assets in curriculum design. This sets apart from Western-centric pedagogy by incorporating local entrepreneurial models.

Each strategy adds synergies. Culturally responsive leadership acts as the basis, host leadership implements power-sharing, while community cultural wealth ensures that solutions are rooted in their specific context.

To systematically address hierarchical dynamics at Thai HEIs, five key protocols could be implemented. Monthly power audits with heat maps can visually track participation across gender, nationality, and background to reveal hidden inequities. The 'Silent Participation Index' can use anonymous polls and chat analysis to capture engagement from students who hesitate to speak in classroom settings. Kreng jai reflection diaries will provide an anonymous platform for students to document instances when cultural deference hindered or enriched their participation. Equity audits of assessments will evaluate rubrics and grading practices to detect biases that privilege Western business models over Asian entrepreneurial strengths. Finally, brave spaces protocols [9] will structure discussions: challenging norms will be framed as acts of respect and will transform classroom culture. Together, these practices combine data-informed accountability with cultural sensitivity to foster tangible change

VII. Conclusion

Leadership reflection on hierarchical classroom dynamics at Thai universities and in international programs respectively reveals that hierarchical classroom dynamics have to be transformed by balancing cultural respect with inclusive innovation. Leveraging Khalifa's trust-building approach [6], HEIs should implement open-door policies and student co-designed rubrics while honoring Ajarns' authority. Yosso's framework [8] helps validate Thai students' familial/social capital, such as local family business knowledge, alongside global perspectives.

Some critical gaps remain as the 'Silent Participation Index' needs additional power audits to evaluate intersectional disparities. Also, Freire's liberatory principles [15] call for more explicit challenges to hierarchy than planned, and underdeveloped local business partnerships still miss community knowledge opportunities.

Moving forward, Thai HEIs need to demonstrate vulnerability through shared 'Is it wrong, Ajarn?' reflections and co-teach with students on Thai and local Asian entrepreneurial models, depending on student background. Grunow's equity audits to assess brave spaces' effectiveness [16] will need to be integrated as true inclusion requires both honoring of Thai cultural assets [6] and intentionally redesigning existing power structures. Only a dual approach can foster student belonging while advancing equity.

To institutionalize successes, HEIs need plans to scale pilots, e.g., democratic classroom frameworks, AI participation tracking, across the university. For policy

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guidelines, guidelines for equitable hiring and pay, and culturally responsive pedagogy are essential. An ongoing dialogue will have to continue with student-faculty design teams and annual equity audits to adapt to evolving changes and needs. Through community partnerships, HEIs can expand local business collaborations and alumni networks for real-world learning of the students.

Additional Take-aways and Recommendations

The study on inclusive leadership growth delivers interesting new insights as these reveal cultural influences from both student and Ajarn side, on which most educators do not reflect profoundly. Educators in Thailand, especially from a non-Thai background, might have heard of the concept of kreng jai, but never really analyzed its potential impact

-similar to the Ajarn authority. Maybe it is often more felt than being completely aware and clear about it. Thailand's hierarchical classroom dynamics are not a 'given'. They are structures that can change, adapt and transform while honoring their roots, part of Khalifa's crucial leadership behaviors [6], which include -among others- the development of culturally responsive teachers and engagement with students' community contexts. The educator's role as a leader is not to reduce students' reverence for Ajarns (and Ajarns' proudness in it) but to redirect both toward mutual empowerment and growth, using frameworks like host leadership [10] to change authority to facilitation.

While the interview findings were insightful-, they are currently limited to two participants. The results are preliminary insights and one recommendation is to expand this with future larger-scale studies, because -interestingly-, kreng jai ethics, often a barrier to participation, can become an engagement tool when reinterpreted as relational currency [8]. Students, initially hesitant to speak, can share ideas as acts of respect, demonstrating that culture can be a powerful tool. The 'Silent Participation Index' forced to confront invisible inequities, such as how some students contributed better in anonymous formats than in live discussions, so its measurement matters. Implementation of inclusive leadership for hierarchical classroom dynamics at a Thai HEI might generate resistance from conservative faculty which are not setbacks but information about where traditional power structures feel most threatened.

One implementation challenge might be to balance urgency with cultural patience. Institutional processes at Thai universities will be slow and complex, early attempts to decentralize power could trigger defensive reactions. The innovation challenge is to explicitly include the validation of the Ajarn's expertise.

Inclusive leadership is not about eliminating the existing hierarchy but making it permeable and dynamic enough to honor all voices.

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IX. Data Availability

No new data were created or analyzed in this study. Data sharing is not applicable to this article.

X. Conflict of interest

The authors declare that there is no conflict of interest.

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