

Proceeding of International University Carnival on E-Learning



INTERNATIONAL UNIVERSITY CARNIVAL ON E-LEARNING

*“ Embracing AI for
Innovative Learning and
Inclusive Education ”*

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Loh Ser Lee

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Nur Zareen Zulkarnain
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Preface

We are pleased to present the e-Proceedings of the International University Carnival on E-Learning 2025 (IUCEL2025), organised by the Centre for Open and Distance Learning (CODL), Universiti Teknikal Malaysia Melaka (UTeM), in collaboration with the Ministry of Higher Education Malaysia (MoHE). The event was supported by the Department of Higher Education, MoHE, and the Public University e-Learning Council (MEIPTA).

Held on 13 November 2025, IUCEL2025 brought together 196 e-learning innovators from 26 institutions. All presenters were invited to submit extended abstracts in August 2025. After a thorough evaluation and peer-review process completed in September 2025, a total of 160 articles were accepted for inclusion in this publication. The papers compiled here represent diverse perspectives and practices aligned with the event's theme, *“Embracing AI for Innovative Learning and Inclusive Education.”*

We extend our sincere appreciation to all authors for their valuable contributions, as well as to the panel of reviewers for their time and expertise. Special acknowledgement is also extended to the Patron of IUCEL2025, Professor Datuk Ts. Dr. Massila binti Kamalrudin, and Chairman, Professor Ir. Dr. Gan Chin Kim, for their leadership and guidance throughout the preparation of this event.

We also express our heartfelt gratitude to the CODL and UTeM team members whose dedication made this publication possible. We hope that the research and ideas presented in this e-proceedings will serve as a meaningful reference for educators, researchers, and practitioners committed to advancing e-learning innovation.

Editors

IUCEL2025 E-Proceedings

Foreword

As Patron of the International University Carnival on E-Learning 2025 (IUCEL2025), I am pleased to present this e-proceedings, which reflects Universiti Teknikal Malaysia Melaka's (UTeM) continued commitment to advancing innovation in digital learning. In collaboration with the Ministry of Higher Education Malaysia (MoHE), IUCEL2025 stands as a testament to our aspiration to nurture a progressive and inclusive educational ecosystem enriched by emerging technologies.

The theme, "*Embracing AI for Innovative Learning and Inclusive Education*," captures the spirit of transformation shaping higher education today. Artificial intelligence, when applied thoughtfully, has the capacity to broaden access, personalise learning experiences, and strengthen teaching effectiveness across diverse disciplines. IUCEL2025 offered a valuable avenue for educators, researchers, and practitioners to reflect on these opportunities and share meaningful insights that will guide the future of e-learning in Malaysia and beyond.

I would like to express my appreciation to all contributors who have shared their work in this publication. My gratitude also goes to the organising committee members, especially those from Centre for Open and Distance Learning (CODL), for their dedication in ensuring the success of IUCEL2025.

I hope that this e-proceedings will serve as a useful resource and inspire continued exploration, collaboration, and innovation in the pursuit of excellence in teaching and learning.

PROFESSOR DATUK TS. DR. MASSILA BINTI KAMALRUDIN

Vice-Chancellor

Universiti Teknikal Malaysia Melaka (UTeM)

Patron, IUCEL2025



TABLE OF CONTENTS

	Editorial & Production Team	i
	Preface	ii
	Foreword	iii
1	SCALABLE MULTI-TIER ASSESSMENT SYSTEM USING CLOUD AND COLLABORATIVE EVALUATION FOR SERVICE-LEARNING PARTICIPATION <i>Masnida Hussin, Nurdiyana Athirah Mohd Asman, Zurita Ismail, Mohamed Faris Laham, Nor Azura Husin & Siti Khadijah Ali</i>	1
2	I-ASSIGNMENT BASED EVALUATION CAD WITH AI VIA ELEARN@USM <i>Mohd Salman Abu Mansor</i>	5
3	STOP! THAT’S MY SPACE: A PICTURE BOOK-BASED SAFETY EDUCATION TOOL FOR EDUCATORS AND CAREGIVERS TO EMPOWER CHILDREN <i>Nur Hidayah Safarudin, Grace Wong Wang Yiing & Natasha Rusdy Wong</i>	8
4	ARTriBE: LEARNING BRIS FOREST PLANTS DIVERSITY <i>Nur Saadah Mohd Shapri, Normala Rahim, Maizan Mat Amin, Mohd Nordin Abdul Rahman, Wan Rizhan & Nadzifah Yaakub</i>	13
5	PERSONALISING LEARNING AT SCALE: A MIXED-METHOD STUDY OF AI-GENERATED BILINGUAL AVATARS AND ADAPTIVE FEEDBACK <i>Jasmine Jain, Mindy Tay Pei Lin, Lee Yee Ling & Tan Shin Yen</i>	17
6	AI-INFUSED DESIGN THINKING FOR INCLUSIVE EDUCATION <i>Chockalingam Aravind Vaithilingam, Murugan Thangiah, Manee Sangaran Diagarajan & Manuel B Garcia</i>	21
7	ENGAGING THE QUIET MIND: LEVERAGING GAMIFICATION AND GENERATIVE AI IN ACTUARIAL GROUP ASSIGNMENTS <i>Lai Kee Huong</i>	25
8	INCLUSIVE LEARNING THROUGH IOT-ENABLED WATER QUALITY MONITORING FOR NIPA PALM AND GULA APONG PRODUCTION-TOWARDS AI EDUCATION <i>Dayang Azra Awang Mat, Hu Guo Huan, Dyg Norkhairunnisa Abang Zaidel & Shafrida Sahrani</i>	29
9	CEKAP I’RAB: MODUL PEMBELAJARAN FLEKSI ARAB BERASASKAN VISUAL <i>Mohd Fauzi Abdul Hamid, Mohamad Lukman Al Hakim Md. Noor, Mohd Firdaus Yahaya, Shaferul Hafes Sha’ari, Wan Muhd Hafizudin Wan Amri Faizal, Azrul Hafiz Kamarudin & Ahmad Fikri Nasrom</i>	32

10	STEMVERSE PHYSIC WORLD: REIMAGINING GRAVITY THROUGH THE METAVERSE <i>Syadiah Nor Wan Shamsuddin & Muhammad Qayyum Mat Nazan</i>	36
11	AI-SCAFFOLDED: BRIDGING PEDAGOGICAL THEORY AND PRACTICE FOR FUTURE EDUCATORS <i>Lee Yee Ling & Vinothini Vasodavan</i>	40
12	DNA TO PROTEIN BOARD GAME: A QR AND AR-ENHANCED BIOTECHNOLOGY BOARD GAME <i>Nadiawati Alias, Nor Hasima Mahmud & Mohd Fahmi Abu Bakar</i>	44
13	CHEMREACT AI: CHATBOT-BASED VIRTUAL LEARNING ASSISTANT FOR ORGANIC CHEMISTRY REACTIONS <i>Norsyafikah Asyilla Nordin & Salmiah Jamal Mat Rosid</i>	47
14	INTEGRATING ARTIFICIAL INTELLIGENCE IN ASSESSING CHILDREN'S AWARENESS OF ENVIRONMENTAL ISSUES THROUGH E-DIGITAL GAMES <i>Sitti Diana binti Tamjehi, Jacey Lynn Minoi, Wilson Rangga anak Anthony Jiram, Farah binti Zaini & Azhaili bin Baharun</i>	50
15	BEAM FRAMEWORK: DRIVING INNOVATIVE AND INCLUSIVE LEARNING TOWARDS AI-READY EDUCATION <i>Nurulfajar bin Abd Manap, Anis Suhaila binti Mohd Zain & Azma Putra</i>	54
16	REIMAGINING LEARNING WITH AI-POWERED HYFLEX EDUCATION <i>Lim Chee Leong & Choong Wai Keng</i>	58
17	GUIDING THE FUTURE: AI-ENHANCED MENTORING FOR REAL-WORLD IN FINAL YEAR PROJECT MODULES <i>G. Manickam Govindaraju & Thanam Subramaniam</i>	63
18	A NEW FRONTIER: HOW THE NFC STUDENTS CARD SYSTEM INTEGRATE IN EDUCATION LEARNING <i>Dayang Kartini Binti Abang Ibrahim, Fatin Ardani Binti Zamri & Muhd Syahazizamir Bin Sahmat</i>	67
19	EDTECH: AN AI EDUCATIONAL MODEL FOR EMPOWERING FASHION DESIGN IDEATION – A CASE STUDY ON BABA NYONYA HERITAGE <i>Marzie Hatuf Jalil</i>	70
20	GAMIFIED EVENT RISK MANAGEMENT: THE RISK QUEST CHALLENGE – SOLO EDITION <i>Hasan Mohamed Zakaria, Azizah Ismail, Norwani Mohd Nazari & Norhafiza Md Sharif</i>	74
21	EMBRACING AI TO EMPOWER B40 WOMEN: A DIGITAL PLATFORM FOR LEARNING, AWARENESS, AND AFFORDABLE MENSTRUAL SUPPORT <i>Sharala Subramaniam</i>	78

22	AI-ENHANCED TPACK-SOLO FRAMEWORK FOR INCLUSIVE DIGITAL LEARNING IN CHEMICAL PROCESS SIMULATION <i>Mohd Kamaruddin Abd Hamid & Norazana Ibrahim</i>	81
23	EMPOWERING CAPTURE THE FLAG (CTF) EDUCATION AND TOOLS BY INTEGRATING AND EMBEDDING AI : FINE TUNING MODELS FROM HUGGING FACE FOR SPECIFIC PURPOSES <i>Ng Zi Yuan & Vinothini Kasinathan</i>	85
24	TOWARDS AI-ENHANCED LEARNING: A COMPREHENSIVE FRAMEWORK FOR TEACHING GROUP COUNSELLING COURSES <i>Nor Mazlina Ghazali, Nur Hanis Fakhru Nizam, Dayang Azra Awang Mat & Nurfaizatul Aisyah Ab Aziz</i>	89
25	ADAPTIVE ONTOLOGY-ENABLED DATA RETRIEVAL MODEL FOR LEARNING ANALYTICS INTEGRATION ACROSS HETEROGENEOUS EDUCATIONAL PLATFORMS <i>Mohd Hafizan Musa, Sazilah Salam, Mohd. Adili Norasikin & Muhammad Syahmie Shabarudin</i>	91
26	INTEGRATING AI INTO THE C.A.R.E. MODEL: TOWARDS TRANSFORMATIVE AND INCLUSIVE LEARNING <i>Khairun Nisa Khairuddin & Hafizah Abdul Rahim</i>	95
27	INTERACTIVE AI-POWERED MANDARIN PRONUNCIATION PRACTICE TOOL FOR MICRO-CREDENTIAL LEARNING <i>Sazilah Salam, Rashidah Lip, Cheong Kar Mee, Siti Nurul Mahfuzah Mohamad, Tan Poh Ee & Mohd. Hafizan Musa</i>	99
28	GAMIFIED MICRO-CREDENTIAL (G-MC) FRAMEWORK FOR ENHANCING LEARNER ENGAGEMENT AND COMPLETION <i>Azizul Mohd Yusoff, Sazilah Salam, Siti Nurul Mahfuzah Mohamad & Mohd Khalid Mokhtar</i>	103
29	HARNESSING AI FOR SCAFFOLDING AND PEER MENTORSHIP IN ACCOUNTING EDUCATION: THE STEP-IN MODEL <i>Shafawaty Mohamad Shabri & Siti Nor Junita Mohd Radzi</i>	107
30	TRANSFORMING WORK-BASED LEARNING THROUGH FLEXIBLE E-LEARNING PLATFORMS <i>Ahmad Nabil Mohd Khalil, Tan Chye Lih & Muhammad Zaki bin Abdul Rahim</i>	111
31	ISLAMIC FINANCIAL PLANNING (IFP) E-LEARNING PLATFORM <i>Mohd Faizuddin Muhammad Zuki, Muhammad Arif Fadilah Ishak, Mohd Zaki Shahabuddin & Muhammad Hafiz Hassan</i>	114
32	LEARN HAEMATOLOGY: AI-POWERED VIRTUAL PLATFORM FOR INCLUSIVE AND ENGAGING HAEMATOLOGY EDUCATION <i>Sumaiyah Adzhar, Mohammad Hudzaifah Nordin, Adibah Daud, Razan Hayati Zulkeflee, Kamariah Abdul Jalil, Syamihah Mardhiah A. Razak, Azzahra Azhar & Sarah Abdul Halim</i>	118

33	COMBINING STRUCTURAL THEORY, HANDS-ON PRACTICE, AND AI TOOLS FOR FUTURE-READY ENGINEERING EDUCATION <i>Nik Zainab Nik Azizan & Shamilah Anudai@Anuar</i>	121
34	ENHANCING UNDERSTANDING OF SUSTAINABLE MANUFACTURING CONCEPTS THROUGH AI-ASSISTED VISUAL-BASED ALTERNATIVE ASSESSMENT <i>Norshah Aizat Shuaib</i>	125
35	MAKE A DIFFERENCE ENTERPRISE (MADE): CATALYZING AI-DRIVEN DESIGN THINKING IN STUDENT LEARNING <i>Manee Sangaran Diagarajan, Chockalingam Aravind Vaithilingam & Sim Yee Wai</i>	129
36	GUIARXEL: INTEGRATED CLASSICAL GUITAR METHOD FOR ACCELERATED BEGINNER MASTERY <i>Herry Rizal Djahwasi, Salman Alfarisi, Muchammad Bayu Tejo Sampurno, Abdul Rahman Safian & Zaharul Lailiddin Saidon</i>	133
37	NEWS FLASH: THE SIMULATED NEWSROOMS FOR 21ST-CENTURY LANGUAGE LEARNING <i>Noraisah Nurul Fatwa Mohd Razali, Nur Syafawati Sabuan, Abdul Jalil Abdul Rahim, Nur Anisnabila Dianah & Umi Kalsom Masrom</i>	137
38	HIPOP (HYBRID POPUP CARDS): AN IMMERSIVE HYBRID LEARNING EXPERIENCE <i>Muchammad Bayu Tejo Sampurno, Abdul Rahman Safian, Herry Rizal Djahwasi, Salman Alfarisi, Muhammad Fazli Taib Saearani, Tri Cahyo Kusumandyoko, Condro Wiratmoko, & Muh Ariffudin Islam</i>	141
39	INTEGRATING GENERATIVE AI INTO SQL LEARNING: A USABILITY STUDY OF A PROMPT-BASED WEB TUTOR <i>Norshadila Ahmad Badela & Anton Satria Prabuwo</i>	145
40	AI STUDYGURU: QUIZ GENERATION AND AUTOMATION POWERED BY AI <i>Mohammad Azmi Bin Mohd Jahil, Halizah Basiron, Ngo Hea Choon & Fitrah Rumaisa</i>	149
41	AI-ENHANCED BOOK-END DIVISION APPROACH FOR TEACHING DIGITAL ELECTRONICS USING DEBUDDY AND DEWBOARD© <i>Nurul Wahidah Arshad, Nurulfadzillah Hasan, Faradila Naim, Norazian Subari & Norasyikin Fadilah</i>	153
42	AI-POWERED TEXT-BASED SIMULATION FOR TRANSFORMATIVE AND INCLUSIVE LEARNING <i>Hafizan Mohamad Naim</i>	157
43	DEEPBEEP: AN AI-DRIVEN STUDENT ATTENTION DETECTION TOOL USING ELECTROENCEPHALOGRAM DATA <i>Eng Lye Lim, Wee Jing Tee, Zixu Cheah, Wei Sheng Chan, Pui Shyn See, Jie Yu Tan & Kai Le Wong</i>	161

44	<p>AGILE MINDS, FLEXIBLE PATHS: REIMAGINING HRM EDUCATION <i>Jen Ling Gan & Li Liu</i></p>	165
45	<p>ENHANCING ADOPTION AND MONITORING OF BLENDED LEARNING PRACTICES AT UNIVERSITI MALAYSIA PERLIS THROUGH THE STUDENT LEARNING TIME CALCULATOR AND BLENDED LEARNING DASHBOARD <i>Mohd Hanafi Mat Som, Siti Khadijah Za'aba, Mohd Azrik Roslan, Muhammad Juhairi Aziz Safar, Azian Azamimi Abdullah & Nur Farahiyah Mohammad</i></p>	169
46	<p>AI-ENHANCED PEKA-PIC: INTEGRATING ARTIFICIAL INTELLIGENCE FOR PLASTIC IDENTIFICATION AND INCLUSIVE EXPERIENTIAL LEARNING <i>Siti Salmi Samsudin & Syarifah Nuraqmar Syed Mahamud</i></p>	173
47	<p>ACHIEVING AN OPTIMAL BALANCE: THE ROLE OF ARTIFICIAL INTELLIGENCE TUTORS IN FACILITATING PERSONALIZED LEARNING <i>Chan Siaw Leng, Sharon Ong Yong Yee, Tan Toh Hii & Fadzilah Yusof</i></p>	177
48	<p>PREDICTIVE ANALYTICS VIA MOODLE LOGS AND EDUCATIONAL DATA MINING STRATEGIES <i>Husna Sarirah Husin, Suriana Ismail, Afizan Azman & Norhidayah Hamzah</i></p>	180
49	<p><i>EARLY AI EDUCATION INVENTION: BRIDGING THE GAP OF AI LITERACY AT THE SECONDARY SCHOOL LEVEL IN MALAYSIA</i> <i>Serena Sim Shing Yin, Lau Bee Theng, Fakir M Amirul Islam & Joel Than Chia Ming</i></p>	183
50	<p><i>CASEQUEST: AN ARTIFICIAL INTELLIGENCE-ENHANCED WEB PLATFORM FOR INCLUSIVE AND ENGAGING PATHOLOGY LEARNING</i> <i>Azzahra Azhar, Liyana Hazwani Mohd Adnan, Nurul Nadhihah Adam, Siti Nadirah Ab Rahim, Ahmad Faris Amir Mohd Nasir, Sineesh A/L Nadaraja, Sharifah Damia Hazirah Syed Abu Bakar, Abdul Rahim Rafliz Khan, Shalini A/P Manimaran, Aiman Haiqal Rosli & Nurhanis Irdina Mohd Suhaizal</i></p>	187
51	<p>PILOTING AI TUTORING IN HIGHER EDUCATION: TRIALS AND ERRORS WITH FIRST-YEAR UNDERGRADUATE ENGINEERING MATHEMATICS <i>Ming Ha Lee, Hui Woon Sim, Chiu Mei Lo, Serena Shing Yin Sim & Ting Yee Hu</i></p>	190
52	<p>HARMONIZING HIGHER MATHEMATICS: AN AI-POWERED MELODIC APPROACH TO CALCULUS EDUCATION <i>Eng Hui Ng & Theresa Chiew Gim Ean</i></p>	194

53	<p>TRANSFORMING FOOD SCIENCE LEARNING WITH SPOON-AI (STUDENT-CENTERED PEDAGOGY WITH OMNIPRESENT ONLINE NURTURING) MODEL</p> <p><i>Sze Ying LEONG, Siok Koon YEO, Sook Wah CHAN, Lye Yee CHEW & Eng Tong PHUAH</i></p>	198
54	<p>SENAM HARMONI: AN INNOVATIVE MOVEMENT PROGRAM BRIDGING CULTURAL HERITAGE AND PHYSICAL FITNESS FOR PRESCHOOL CHILDREN</p> <p><i>Muhammad Fazli Taib Saearani, Abdul Hamid Chan & Hafzan Zannie Hamza</i></p>	202
55	<p>INTEGRATING GAMIFICATION AND AI FOR ACTIVE LEARNING IN ELECTRICITY: CIRCUITOUS</p> <p><i>Siti Maisarah Aziz, Nurulhuda Mohammad Yusoff, Siti Noor Syuhada Mohd @ Muhammad Amin</i></p>	205
56	<p>METAVEVERSE APPLICATIONS AND TECHNICS FOR REAL-TIME INTERACTIVE EXPERIENCES (MATRIX) - DEVELOPING FUTURE- READY COMPETENCIES FOR VIRTUAL DESIGN AND CONSTRUCTION</p> <p><i>Xia Sheng Lee, Tamil Salvi Mari, John Hii Ing Kieng, Faisal Athar Mohd Fadzil & Nurlaili Mohd Azizi</i></p>	209
57	<p>ARGUESSAY EVALUATOR: AUTOMATING ARGUMENTATIVE WRITING ASSESSMENT THROUGH CUSTOM GPT INNOVATION</p> <p><i>Nik Ahmad Farhan Nik Azim, Hasnah Ab. Kadir, Suhaida Omar & Liyanan Ahmad Afip</i></p>	213
58	<p>VIRTUAL SLIDES, REAL LEARNING: ENHANCING VETERINARY PATHOLOGY EDUCATION THROUGH THE USE OF DIGITAL SLIDES</p> <p><i>Fathin Faahimaah binti Abdul Hami, Muhammad Ali Imran bin Mohamed Kamil, AbuBakar Danmaigoro, Suhaimi Bin Omar, Muhamad Faiz bin Juha & Siti Rokiah Binti Awang</i></p>	217
59	<p>SCOREEDGE: A GPT-TRANSFORMER POWERED AI-BASED ASSESSMENT CHECKER</p> <p><i>Nooraziah Ahmad, Siti Salina Saidin & Mohd Yusri Mohd Naser</i></p>	221
60	<p>MICROMON: GAMIFIED MICROBIOLOGY REVISION THROUGH INTERACTIVE ROLE-PLAYING</p> <p><i>Salwani Ismail, Kamariah Abdul Jalil, Sofwal Widad Suhaimee, Mohamad Syarif Akmal Ibrahim, Muhammad Firdaus Mohd Hasan, Muhammad Irfan Sukri, Muhammad Hafeezuddin Hussin & Muhamad Danish Hilman Abdul Aziz</i></p>	225
61	<p>SMART MINDS, SUSTAINABLE MEALS (SMSM): STUDENT- CENTERED, AI-DRIVEN LEARNING AND TRANSDISCIPLINARY EVOLUTION</p> <p><i>Sook Wah Chan, Affezah Ali, Aqilah Yaacob & Yen Mee Leow</i></p>	229

62	<p>TRAUMA BUDDY: REVOLUTIONIZING TRAUMA LIFE SUPPORT MALAYSIA EDUCATION THROUGH INCLUSIVE ARTIFICIAL INTELLIGENCE LEARNING</p> <p><i>Wan Muhamad Farid Firdaus Wan Anuar, Ahmad Hafiz Alias, Nur Afuza Mahazir, Muhammad Adlishah Akhmal Razali, Muhammad Aqil Akhmal Mohd Rohemi, Nurul Izzati Nazri, Nurul Hidayah Norjilan & Nur Eliyana Faqihah Azmi</i></p>	233
63	<p>REKA.IO: EMPOWERING INDUSTRIAL DESIGN STUDENTS' IDEATION WITH GUIDED AI</p> <p><i>Shahrul Anuwar bin Mohamed Yusof, Addy Putra bin Md Zulkifli, Amirul Fahmi bin Razali, Sharih Ahmad bin Mohamad, Nor Ziratul Aqma binti Norzaman, Syarilla Iryani binti Ahmad Saany, Syadiah Nor binti Wan Shamsuddin & Khairun Nisa binti Mustaffa Halabi</i></p>	237
64	<p>FOOD CROP PORTFOLIO: STUDENT ACTIVE LEARNING THROUGH 3D MODEL</p> <p><i>Elisa Azura Azman, Roslan Ismail, Nor Elliza Tajidin, Sarah Baharudin & Mashitah Jusoh</i></p>	242
65	<p>BLENDING RESEARCH, ARTIFICIAL INTELLIGENCE, & NEUROSCIENCE: ADVANCING INNOVATION DESIGN (BRAIN-AID)</p> <p><i>Ross Azura Zahit</i></p>	246
66	<p>CULTIVATING AI-READY ENGINEERS: A DIGITAL LEARNING ECOSYSTEM INTEGRATING BLOOM'S AND SOLO TAXONOMIES FOR INCLUSIVE PROCESS DESIGN EDUCATION</p> <p><i>Nurhazwani Yusoff Azudin</i></p>	250
67	<p>A CONCEPTUAL FRAMEWORK FOR INCLUSIVE LEARNING IN CIRCUIT THEORY I USING AI AND DIGITAL SIMULATIONS</p> <p><i>Dyg Norkhairunnisa Abang Zaidel, Mohd Ridhuan Mohd Sharip & Dayang Azra Awang Mat</i></p>	254
68	<p>FROM VOICES TO VALUES: ENHANCING ASSESSMENT USING ARTIFICIAL INTELLIGENCE TRANSCRIPTION</p> <p><i>Makhfudzah Mokhtar, Ramiza Darmi, Ahmad Salahuddin Mohd Harithuddin, Askiah Jamaluddin & Siti Mariam Shafie</i></p>	258
69	<p>IDIOM GAME HUB: A COMPLETE GAMIFIED IDIOM LEARNING PACKAGE FOR ESL LEARNERS</p> <p><i>Mohammad Affiq Kamarul Azlan, Noraini Hj Zaini, Wan Yusoff Wan Shaharuddin, Nur Syahirah Mohd Nawawi & Noor Syamimie Mohd Nawawi</i></p>	262
70	<p><i>EduVerse: AN IMMERSIVE METAVERSE INNOVATION FOR AI EDUCATION</i></p> <p><i>Muhammad Aliff Firdaus Saffi'ai, Amirul Haqiem Zulkifli & Anis Farihan Mat Raffei</i></p>	265

71	EMBRACING AI FOR IMMERSIVE LEARNING AND INCLUSIVE EDUCATION WITH ENGAGEVR <i>Thivilojana Perinpasingam, Tan Shin Yen, Faisal Mohammad Athar, John Hii Ing Kieng & Aleksandra Kutsenko</i>	269
72	FROM CRAFT TO CODE: AI-DRIVEN INNOVATION IN CONSTRUCTION LEARNING <i>Adila Zakaria, Fadhlina Ahmad @ Taufik, Muhammad Faizal Abdul Rani, Mohammad Ezzad Abu Bakar, Iziq Eafifi Ismail & Tengku Intan Suraya Tengku Aziz</i>	273
73	AI-DRIVEN TPACK FOR INCLUSIVE BLENDED LEARNING: TRANSFORMING APPLIED THERMODYNAMICS EDUCATION <i>Yan Yan Farm</i>	277
74	GLOBAL VOICES: AI PERSONA LAB <i>Galvin Kuan Sian Lee</i>	281
75	VETVERSE: EXPLORING VIRTUAL REALITY APPLICATIONS IN VETERINARY MEDICINE-ENHANCING EDUCATION, DIAGNOSIS, AND TREATMENT <i>Intan Noor Aina Kamaruzaman, Nur Shahirah Sofea binti Azmi, Mohammed Dauda Goni & Azmi Mohd Yusof</i>	285
76	MYNX: MOVES – AN AI-DRIVEN E-LEARNING ECOSYSTEM FOR THE REVIVAL OF MALAYSIAN TRADITIONAL SPORTS AND GAMES <i>Addy Putra bin Md Zulkifli, Shahrul Anuwar bin Mohamed Yusof, Amirul Fahmi bin Razali, Sharih Ahmad bin Mohamad, Nor Ziratul Aqma binti Norzaman & Engku Aiesyah Amirah Binti Engku Md Azmi</i>	289
77	FOSTERING STUDENT INTEREST AND ENGAGEMENT THROUGH EDU BOX SMARTLEARN IN ONLINE HIGHER EDUCATION <i>Nik Nur Azizah Nik Halman, Wan Nor Jazmina Wan Ariffin, Wan Nor Azilawanie Tun Ismail, Mohamad Hafis Amat Simin & Roslieza Rosli</i>	293
78	S2P (SLIDE TO PODCAST): ENHANCING STUDENT ENGAGEMENT THROUGH PODCASTS <i>Norhuda Salleh, Soon Fook Fong, Fiffy Hanisdah Saikim & Mohamad Syahrul Nizam</i>	297
79	AI APPS FOR QURAN MODULE LEARNING IN PRIMARY SCHOOL <i>Hafiz bin Hamzah & Noor Hafizah binti Dumi</i>	301
80	BEYOND THE BLUEPRINT: XRI IN ACTION AT TAYLOR'S UNIVERSITY STEM PROGRAMMES <i>Kenn Jhun Kam, Tze Shwan Lim, Faisal Athar bin Mohd Fadzil & Kennedy Tiong Kwong Shin</i>	304

81	ISOMAR: MODUL REALITI TERIMBUH UNTUK TRANSFORMASI ISOMETRI <i>Noorul Shuhadah Osman, Ahmad Fauzi Mohd Ayub, Jazihan Mahat & Nurul Nadwa Zulkifli</i>	309
82	CHEMISTREE: A NEW HOLISTIC APPROACH IN LEARNING CHEMISTRY <i>Noor Syuhadah Subki & Saiful Akramin Mhd Nor</i>	313
83	TEACHING IN THE METAVERSE: AN AI-POWERED LOOK INTO VIRTUAL REALITY AMONG UNIVERSITY STUDENTS <i>Umi Kalsom Kassim, Jayasutha Matiah & Cliffton Baba Nyepit</i>	316
84	INSIDE SPECTRUM VR: ENHANCING EDUCATORS' EMPATHY AND UNDERSTANDING OF AUTISM STUDENTS THROUGH IMMERSIVE SIMULATION <i>Goh Wei Wei, Mohammad Hadi Ahmadi Milaghardan, Ji Tian Tong, Charles Sharma Naidu, Chong Pei Pei & Sumathi Balakrishnan</i>	320
85	<i>INTEGRASI BUDAYA POP DAN TEKNOLOGI: PENGGUNAAN MEME DALAM MENINGKATKAN PERBENDAHARAAN KATA BAHASA JEPUN</i> <i>Muhammad Azri Hafifi Bin Mohd Zaludin, Tengku Iffah Biti Tuan Yazid & Kasma Binti Mohd Hayas</i>	324
86	BRIDGING PLAY AND AI THROUGH A HYBRID BOARD GAME FOR ADAPTIVE FORMATIVE ASSESSMENT IN PROGRAMMING EDUCATION <i>Mohamad Firdaus Che Abdul Rani, Nor Hafizah Adnan, Ahmad Zamri Mansor, Melor Md Yunus</i>	328
87	INTEGRATING ARTIFICIAL INTELLIGENCE INTO LEARNING MANAGEMENT SYSTEMS FOR SMARTER COURSE SUPPORT <i>Ts. Mohd Hafriz Nural Azhan, Nur Azira Jusoh, Prof. Ts. Dr. Salisa Abdul Rahman, Prof. Madya ChM. Dr. Maisara Abdul Kadir, Prof. Madya Dr. Siti Nor Khadijah Addis, Muhammad Ismail Afandi Muda, Yuzawani Yusoff, Khairul Bukhari Abd Hamid & Abdul Hadi Ismail</i>	332
88	<i>AI-POWERED SUPPORT SYSTEMS: CONVERSATIONAL AI FOR INCLUSIVE AND INTELLIGENT e-LEARNING</i> <i>Nur Azira Jusoh, Ts. Mohd Hafriz Nural Azhan, Prof. Madya ChM. Dr. Maisara Abdul Kadir, Prof. Madya Dr. Siti Nor Khadijah Addis, Muhammad Ismail Afandi Muda, Yuzawani Yusoff, Khairul Bukhari Abd Hamid & Abdul Hadi Ismail</i>	336
89	BLOOMWISE: AI-ASSISTED GAMIFIED TOOL FOR TAXONOMY-BASED ASSESSMENT DESIGN <i>Siti Sabariah Abas, Mumtazimah Muhammad, Maizan Mat Amin, Nazirah Abd Hamid & Wan Malini Wan Isa</i>	340

90	BEYOND THE BEDSIDE - AI-ENABLED VIRTUAL PATIENT SIMULATION FOR CLINICAL HISTORY TAKING <i>Ahmad Hathim Ahmad Azman & Noor Akmal Shareela Ismail</i>	343
91	<i>GamiKelas 2.0: DIGITALLY IMMERSIVE BLENDED CLASSROOM LEARNING THROUGH GAMIFICATION, METAVERSE, GEN AI AND ALTERNATIVE ASSESSMENT</i> <i>Abd Hadi Abd Razak, Nur Fadziana Faisal Mohamed, Syamsyul Anuar Che Mey @ Ismail, Siti Syamsul Nurin Mohmad Yazam & Marzura Ibrahim</i>	347
92	LEVERAGING AI-ENHANCED VISUAL LEARNING AND ACTIVITIES IN TEACHING BIOMEDICAL POLYMERS <i>Syarifah Nuraqmar Syed Mahamud & Siti Salmi Samsudin</i>	351
93	SPATIAL NARRATIVES IN MINIATURE: AUTHENTIC ASSESSMENT THROUGH 3D CONCEPT MODELLING <i>Dr Siti Nuratirah Che Mohd Nasir, Ts Salmiah Aziz & Mohammad Hafiz Hisyam Mohd Hashim</i>	355
94	INNOVA BARI MELAYU <i>Mardiana Ismail & Lena Farida Hussain Chin</i>	358
95	JADUAL HAIDKU: INTEGRATING AI FOR MENSTRUAL HEALTH AWARENESS, FIQH LITERACY, AND INCLUSIVE EDUCATION <i>Mashanum Osman, Maslita Abd Aziz, Norun Najjah Ahmat, Chuah Ming Xua, Sazalinsyah Razali, Nurul Akmar Emran & Muhammad Faris Abd Ghafar</i>	362
96	INSIGNED: SPEECH-TO-SIGN LANGUAGE USING AI POWERED COMPANION FOR DEAF COMMUNITIES – TEACHING BEYOND BARRIERS <i>Murugan Thangiah, Chockalingam Aravind Vaithilingam, Thimmareddy Sharat Chandra Reddy, Gajjala Hrithvik Reddy & Muhammad Khujaev</i>	366
97	THE HUMAN BRAIN <i>Elissa Nadia binti Madi, Zahrahtul Amani binti Zakaria, Azilawati binti Rozaimie, Aainaa Sumayya binti Azmi, Nur Amalin Aisya binti Azadil Akman & Nur Alia Farhana binti Mustafa</i>	370
98	AISTATSBOX: PORTABLE STATISTICAL APP WITH GENERATIVE AI ASSISTANCE FOR TEACHING AND LEARNING STATISTICS <i>Muhammad Jaffri Mohd Nasir, Mohammed Dauda Goni & Nurzulaikha Mahd Ab. Lah</i>	374
99	<i>MyLegS MOBILE APP: THE SMART WAY TO LEARN MALAYSIAN LEGAL SYSTEM</i> <i>Shariffah Nuridah Aishah binti Syed Nong Mohamad, Zuhairah Ariff binti Abd Ghadas, Hartinie binti Abd Aziz, Ilylyana binti Che Rosli & Wan Mohd Amir Fazamin bin Wan Hamzah</i>	378

100	LEVERAGING THE USE AI FOR ASSESSMENT IN MALAYSIAN UNIVERSITIES <i>Nurzatil Sharleeza Mat Jalaluddin & Abdullah Al-Hadi Ahmad Fuaad</i>	382
101	KIT FOREST BOX WITH NFC INTEGRATION: ENHANCING STUDENT LEARNING EXPERIENCE FOREST RESOURCE ECONOMICS <i>Nur Fadzlunnisaa' Wakimin, Affendy Hassan, Go Wen Ze, Thamer A. Thabet & Aida Nabihah M. Khattab</i>	386
102	SPRIDIVE: STUDENT PRESENTATION IN DIGITAL INNOVATION FOR VETERINARY EDUCATION <i>Mohammad Sabri Abdul Rahman, Faez Jesse Firdaus Abdullah, Ruhil Hayati Hamdan, Tan Li Peng, Mohd Farhan Hanif Reduan, Intan Noor Aina Kamaruzaman, Basripuzi Nurul Hayyan Hassan Basri & Goh Soon Heng</i>	390
103	CYBERSECURE VR: BEHAVIOR CLONING-BASED IMMERSIVE MICROCREDENTIALS FOR THREAT SIMULATION AND RESPONSE <i>Mohd Faizal Ab Razak^{1*}, Salwana Mohamad @ Asmara, Nor Saradatul Akmar Zulkifli¹, Danakorn Nincarean & Amirul Aidil Hasnul Azan</i>	394
104	THE ROLE OF QUIZ GAMES IN IMPROVING STUDENT ENGAGEMENT AND UNDERSTANDING OF RETAIL TECHNOLOGY <i>Norhafifah Binti Samsudin, Aimi Nadia Binti Ibrahim@Zakaria, Nurul Hasliana Binti Hamsani, Nur Syakirah Binti Ahmad & Muhammad Firdaus Bin Zakaria</i>	398
105	WELL (WELLNESS ENHANCED LIFELONG LEARNING) NEXUS: EMPOWERING WELLNESS INNOVATION EDUCATION THROUGH HYBRID DIGITAL-PHYSICAL LEARNING <i>Ahmad Faezi Ab. Rashid, Norsyamliana Che Abdul Rahim, Norsuriani Samsudin, Nor Dalila Marican, Nurul Hafizah Mohd Yasin, Lee Wan Zhen, Fakhitah Ridzuan & Nur Ilyana Amiiraa Nordin</i>	402
106	E-BOT QUAKE: INTERACTIVE, EDUCATIONAL, LIFE-SAVING <i>Soon Singh Bikar Singh, Zulfhikar Rabe, Muralindran Mariappan, Sabariah Sharif, Balan Rathnakhrisnan & Rosy Talin</i>	406
107	EMPOWERING BOLD SPEAKERS: A HYFLEX PUBLIC SPEAKING PEDAGOGY INNOVATION <i>Deborah Chris Raj & M.R Naveen Raman</i>	410
108	LEVERAGING ARTIFICIAL INTELLIGENCE TO CREATE ANIMATED LECTURE VIDEOS: A STUDY ON STUDENTS' KNOWLEDGE AND FUNCTIONAL SKILLS OF AI USAGE <i>Norsuriani Samsudin, Nurul Hafizah Mohd Yasin, Lee Wan Zhen, Ahmad Faezi Ab. Rashid, Mazne Ibrahim, Myzatul Aini Ma'asor @ Mansor & Mohd Hafzal Abdul Halim</i>	414

109	EMPOWERING CHEMISTRY LEARNING THROUGH HUMAN-AI COLLABORATION: INTEGRATING AI AGENTS WITH 5E PEDAGOGICAL INNOVATION <i>Wong Yau Hsiung</i>	417
110	AI-DRIVEN IMMERSIVE LEARNING WITH STUDENT-DESIGNED BIOCHEMISTRY GAMES <i>Wan Suriyani Wan-Ibrahim, Nadiah Ameram, Nur Sakinah Mohamed Tamat & Azfi Zaidi Mohammad Sofi</i>	421
111	INTEGRASI AI BAGI PEMBELAJARAN INOVATIF: PENDEKATAN BERPUSATKAN PELAJAR DALAM KURSUS BIMBINGAN DAN KAUNSELING <i>Nur Azmina Paslan, Mastura Mahfar, Fauziah Zaiden & Jamaludin Ramli</i>	425
112	INNOVATIVE MULTIPLAYER GAME-BASED FRAMEWORK FOR INCLUSIVE LEARNING AND CRITICAL THINKING <i>Zalifah Mansor & Heru Astikasari Setya Murti</i>	429
113	VR RESPONSE TVET: A MULTIMODAL USER EXPERIENCE MODEL FOR INCLUSIVE VOCATIONAL TRAINING OF ASD LEARNERS <i>Nur Aleesya Mohd Asri, Normala Rahim, Norsuhaily Abu Bakar, Wan Rizhan, Ismahafezi Ismail, Nur Saadah Shapri & Sarah Farhana Juhari</i>	433
114	ENTOMOLOGY REIMAGINED: TECH-ENHANCED LEARNING FOR SMART INSECT EDUCATION <i>Norashikin Fauzi, Nuramirah Mat Zain, Nur Qistina Abd Aziz, Musfiroh Jani & Noor Syuhadah Subki</i>	437
115	INSECT RACE 2.0: ENRICHING LEARNING EXPERIENCE USING A GAME-BASED LEARNING APPROACH INTEGRATED WITH ARTIFICIAL INTELLIGENCE TOOLS <i>Siti Nurlydia Sazali, Tan Wei Lim, Nurfarida Anum Zainaddin & Ratnawati Hazali</i>	440
116	ENHANCING DIGITAL STORYTELLING IN HIGHER EDUCATION: INTEGRATING THE STORYSCAPE INTERACTIVE MODULE WITH WHATSAPP COMMUNITY <i>Nor Jijidiana Azmi, Wan Mohd Fadzli bin W. Samsudin, Ahmad Helmie bin Ahmad & Ahmad Syarafuddin bin Che Azih</i>	444
117	ENTOMANIA <i>Nurfarida Anum Zainaddin, Tan Wei Lim, Siti Nurlydia Sazali & Ratnawati Hazali</i>	449
118	REIMAGINING PC ASSEMBLY LEARNING IN TECHNICAL EDUCATION WITH ARTIFICIAL INTELLIGENCE (AI) AND IMMERSIVE VIRTUAL REALITY(VR) APPROACH <i>Nor Saradatul Akmar Zulkifli, Danakorn Nincarean Eh Phon Muhammad Harith Zulhairi, Iyad Hakimi Syukur, Muhammad Anazhakimi Mohammad & Muhammad Izzuddin Mohmed Rejab</i>	453

119	BENICE (BELAJAR DAN LATIH SEHINGGA CEKAP EMOSI): AN AI-POWERED E-LEARNING PLATFORM FOR INCLUSIVE DIGITAL MENTAL HEALTH EDUCATION IN SELF-HARM PREVENTION <i>Tengku Mohd Saifuddin Tengku Kamarul Bahri, Khairi Che Mat, Muhammad Syaqqim Hafifi Abdul Rahman, Hanisah Mohd Noor, Muna Hamiza Asiff, Mohd Salami Ibrahim & Owi Thai Loon</i>	457
120	SMARTMUAMALATAI: COMIC-BASED ISLAMIC FINANCE EDUCATION <i>Nadhirah Nordin, Raja Madihah Raja Alias, Hannan Fatini Md Reshad & Nur Amani Aisyah Samsuddin</i>	460
121	ETHICWISE INNOVATION IN SOCIAL AND ENVIRONMENTAL ASPECTS OF TEACHING AND LEARNING <i>Hezzrin Mohd Pauzi</i>	464
122	PENGGUNAAN PENJANA KECERDASAN BUATAN DALAM PEMBELAJARAN BERASASKAN PROJEK BERORIENTASIKAN MASALAH INDUSTRI <i>Aryati Bakri & Rozilawati Binti Dollah @ Md. Zain</i>	468
123	CLAIMOPOLY: AN INTERACTIVE GAMIFIED TOOL FOR LEARNING NUTRIENT COMPARATIVE CLAIMS IN FOOD LABELLING <i>Wan Anwar Fahmi Wan Mohamad, Muhammad Alif Aiman Zamzuri, Nur Athirah Nisa Mohd Sukor, Nur Aqilah Najwa Mohd Khairuddin, Nur Asyiqin Yaccob, Nur Camilla Nisa Asyran Raoef & Nur Atiyah Hana Azizi</i>	472
124	TRUST: A USER-CENTRED 3D ANIMATION FOR RAISING CHILD SEXUAL AWARENESS <i>Azlin Sharina Abdul Latef, Muhammad Muaz Syafiee Kamal, Nuzul Haqimi Muhammad, Hana Yazmeen Hapiz & Tenh Hock Kuan</i>	476
125	eBCSi©: VETERINARY AI FOR FOOD SECURITY <i>Mohd Faizal Ghazali, Noor Syaheera Ibrahim, Dayang Ayu Syamilia Che Roi, Ong Yew Chuan, Siti Mariam Zainal Ariffin, Najmi Wahidi Ab Wahab & Noor Fazzle Mohd Zawawi</i>	480
126	NEURON: A DIGITAL LEARNING MODULE FOR ENHANCING STUDENT ACHIEVEMENT IN GENETIC INHERITANCE <i>Hanna Mohd Hussaini, Salmiza Saleh, Shahabuddin Hashim, Nurul 'Ain Abdul Halim, Haizal Mohd Hussaini & Mohd Affandi Shafie</i>	484
127	AI-ENHANCED CYBER THREAT ANALYSIS MODULE FOR SOC-BASED LEARNING <i>Salasiah Sulaiman, Julia Juremi, Intan Farahana Kamsin & Mohamad Firdaus Che Abdul Rani</i>	489
128	<i>EnviroLawFun: FROM STUDENTS TO COMMUNITY</i> <i>Wan Rohila Ganti bt Wan Abdul Ghapar</i>	493

129	SMARTFLEX PEERS: INTELLIGENT AND FLEXIBLE ENTREPRENEURSHIP LEARNING WITH AI <i>Nur Thara Atikah binti Zainal</i>	497
130	TRANSFORMATIVE IOT TEACHING: THE IMPACT OF AI TOOLS <i>Sumathi Balakrishnan, Goh Wei Wei, Siva Raja Sindiramutty & Tee Wee Jing & Lim Eng Lye</i>	501
131	NUTRI-XR: IMMERSIVE VR/AR NUTRITION KITS TO PREVENT OBESITY <i>Norsymlina Che Abdul Rahim, Amzari Abu Bakar, Ahmad Faezi Ab. Rashid, Nor Dalila Marican & Siti Fatimah Binti Abdul Razak</i>	505
132	EDUSkillUP: IMMERSIVE AND INTERACTIVE DIGITAL LEARNING MODULE FOR FORM 4 ADDITIONAL MATHEMATICS USING GEOGEBRA AND AUGMENTED REALITY <i>Hamizah Mohd Safuan, Nik Adelyn Nik Rosdi, Norzidah Mad Ainal, Che Samihah Che Dalim, Khuneswari Gopal Pillay & Noorzehan Fazahiyah Md Shab</i>	509
133	LESSONWEAVER: AI-ENHANCED ADAPTIVE LEARNING PLATFORM <i>Nuzul Haqimi Muhammad & Azlin Sharina Abdul Latef</i>	513
134	METAKELAS: REVOLUTIONISING ONLINE CLASSES THROUGH METAVERSE AND THIRD PERSON PERSPECTIVE IMMERSION TO ENHANCE LEARNING OUTCOMES EFFECTIVENESS <i>Nur Fadziana Faisal Mohamed, Abdul Hadi Abdul Razak, Syamsyul Anuar Ismail, Marzura Ibrahim & Siti Syamsul Nurin Mohmad Yazam</i>	517
135	POWERASSESSMENT AS AN ASSESSMENT ANALYTICS FOR BUILDING QUALITY QUESTION BANKS: CAN BI DASHBOARDS TRANSFORM ASSESSMENT AND LEARNING? <i>Hassan Basri Bin Mukhali, Mohd Salami Bin Ibrahim, Megat Mustaqim Bin Megat Iskandar, Siti Hawa Binti Nordin, Siti Yusrina Nadiyah Binti Jamaludin, Yasrul Izad Bin Abu Bakar & Ahmad Hafiz Bin Alias</i>	521
136	ARTIFICIAL INTELLIGENCE-ENHANCED “REEL, REFLECT, AND RISE”: A ToTLAS x SCALE APPROACH TO STUDENT-DRIVEN AQUATIC ANIMAL HEALTH LEARNING <i>Ruhil Hayati Hamdan, Tan Li Peng, Mohammad Sabri Abdul Rahman, Goh Soon Heng, AbuBakar Danmaigoro, Basripuzi Nurul Hayyan Hassan Basri, Murshidah Mohd Asri, Amirul Faiz Mohd Azmi, Luqman Abu Bakar, Mimi Armiladiana Mohamad, Dauda Goni, Nur Hidayahanum Hamid, Nora Fatin Afifah binti Mohamad, Rumaizi Shaari & Choong Siew Shean</i>	525
137	D-PenSIMA: RAISING FOOD WASTE MANAGEMENT AWARENESS THROUGH INTERACTIVE GAMEPLAY <i>Tengku Halimatun Sa’adiah T Abu Bakar, Maryana Mohamad Nor, Suhana Zakaria, Zuharlida Tuan Harith, Mohd Mahmud, Norhafizah Md Zain, Noorhazira Sidek, Muhammad Nurfaiz Abd. Kharim, Mohd Fauzie Jusoh & Mardawani Mohamad</i>	529

138	EXPERIENTIAL LEARNING INNOVATION VIA PUBLIC TIKTOK ADVOCACY <i>Hadhrami Ab Ghani & Mohd Hakimi Aiman Ibrahim</i>	533
139	LEXITUNE: FROM HANZI TO HIRAGANA—A MUSIC-DRIVEN MOBILE APP FOR NOVICE CHINESE & JAPANESE LEARNERS <i>Julia Tan Yin Yin, Fakhitah Ridzuan, Tan Tse Guan, Chua Aun Geong, Nor Alina Ismail, Yasmin See, Muhammad Azri Hafifi Mohd Zaludin, Hanim Mustafa & Fazura Zulkifle</i>	537
140	YOUTUBE AS A PLATFORM FOR SURGICAL E-LEARNING AND STEP- BY-STEP PROCEDURAL GUIDANCE BY WHITECOAT TURTLE <i>Dr Ahmad Fardi Sulaiman, Dr Hasmali Mohamad, Dr Fatin Mardhiyyah Hussin, Nurul Zarith Afisya Nurul Azhar, Nur Aishah Athirah Abdullah, Kauthar Roselan & Siti Qhairunnisa Saharudin</i>	541
141	A-MaSTer: A SELF-DIRECTED LEARNING APPLICATION TO ENHANCE STUDENTS' MORAL JUDGEMENT <i>Nurul 'Ain Abdul Halim, Shahabudin Hashim, Hanna Mohd Hussaini, Anis Humaira Mohamad Zaham & Seffetullah Kuldaz</i>	543
142	PENGATURCARAAN SCRATCH MENGGUNAKAN PENJANA KECERDASAN BUATAN <i>Farkhana Muchtar, Aryati Bakri, Mohd Kufaisal Mohd Sidik, Ahmad Fariz Ali, Ismail Fauzi Isnin & Carolyn Salimun @Jackson</i>	547
143	NOTTALONE: PROMOTING MENTAL HEALTH LITERACY AMONG UNIVERSITY STUDENTS THROUGH A GAMIFIED DIGITAL TOOLKIT <i>Siti Khadijah Zainal Badri, Nur Zahira Zulkarnain, Anshali Manoharan, Anshana Manoharan, Ahamed Miflah Hussain, Hoh Chin Chin & Raja Nadirah Raja Mohd Halim</i>	549
144	MAPPING BARRIERS AND OPPORTUNITIES: ADVANCING INCLUSIVE SERVICE DELIVERY FOR AUTISTIC CHILDREN IN KELANTAN. <i>Ruzaini Bin Ijon, Azizul Bin Ahmad, Yohan Kurniawan, Nik Ahmad Farhan Bin Azim@Nik Azim, Fairuz A'dilah Binti Rusdi, Azahah Binti Abu Hassan Sha'ari, Siti Amirah Binti Ahmad Tarmizi, Tarmiji Bin Masron & Asykal Syakinah Binti Mohd Ali</i>	553
145	IMMERSIVE CULTURAL LEARNING REIMAGINED: ENHANCING INTANGIBLE CULTURAL HERITAGE EDUCATION THROUGH WAYANG DIMENSION <i>Fara Dayana Mohd Jufry, Azrul Azizi Amirul, Mohammad Naquiddin Tajul Ariffin & Nor Masharah Husain</i>	557
146	NADI SIRAH v1 <i>Muhammad Talhah Ajmain @ Jima'ain, Muhammad Faris Faisal Ahmad Raddi, Muhammad Syazmi Musa, Abdul Basit Samat @ Darawi & Kasmaizun Enuni Mohd Sarji</i>	561

147	YOUTH-SOCIAL ENTREPRENEURSHIP READINESS ASSESSMENT TOOL <i>Nur Izzati Ab Ghani, Hawa Husna Ab Ghani, Farah Roslan, Nur Syifaa Athirah Mohd Said & Zanariah Mohd Nor</i>	565
148	AI4CULINARY: INTEGRATING GENERATIVE AI AGENTS IN EXPERIENTIAL CULINARY PORTFOLIOS FOR REFLECTIVE AND CREATIVE LEARNING <i>Salmalina Salleh, Salmaliza Salleh, Noor Azean Atan & Mohamad Izzuan Mohd Ishar</i>	569
149	CHEMISTORY EXPLORER: DISCOVERING THE ROOTS OF CHEMISTRY <i>Nur Atikah Arbain, Hidayah Rahmalan, Syahida Mohtar & Ahmad Fadzli Nizam Abdul Rahman</i>	573
150	AN AI-DRIVEN COLLABORATIVE ENGAGEMENT (CE) APPROACH FOR TEACHING AND LEARNING ENTITY-RELATIONSHIP DIAGRAM (ERD) DESIGN <i>Nor Mas Aina Md Bohari, Hidayah Rahmalan, Nur Atikah Arbain, Syahida Mohtar & Fathin Nabilla Binti Md Leza</i>	577
151	PENGUNAAN APLIKASI KAMUS USULUDDIN DAN APLIKASI MYSHAKHSIYYAH DALAM PEMBELAJARAN ILMU ISLAM <i>Mohd Hasrul Shuhari, Muhammad Rashidi Wahab, Muhammad Hafizi Rozali, Wan Mohd Amir Fazamin Wan Hamzah, Mohd Kamir Yusof, Mustafa Man & Muhammad Naufal Mohd Hasrul</i>	581
152	INNOVATIVE CAPSTONE ASSESSMENT NEXUS (ICAN): A HYBRID MODEL FOR AUTHENTIC, INDUSTRY-LINKED, AND AI-RESILIENT ASSESSMENT IN HIGHER EDUCATION <i>Sharifah Sakinah Syed Ahmad, Noor Fazilla Abd Yusof & Nur Zareen Zulkarnain</i>	584
153	AI MEETS HERITAGE: A CONCEPT PAPER OF CO-CREATING YAOZHOU KILN LEARNING IN THE DIGITAL CLASSROOM <i>Mohan Wang, Yuek Li Ker & Chee Beng Yang</i>	588
154	THE EFFECTIVENESS OF A BUSINESS MODEL BOARD GAME AS AN INNOVATIVE EXPERIENTIAL LEARNING TOOL FOR AN ENTREPRENEURSHIP COURSES <i>Mohd Guzairy Abd Ghani, Mohd Syafiq Md. Taib & Wan Muhammad Idham Wan Mahdi</i>	592
155	TRANSCENDING DIMENSIONS: REIMAGINING MOTIF LAPAN THROUGH AUGMENTED REALITY FOR CULTURAL AND EDUCATIONAL INNOVATION <i>Nurulfajar bin Abd Manap & Anis Suhaila binti Mohd Zain</i>	596

156	TVET WORMS APPLICATION: AI-POWERED LEARNING SUPPORT <i>Hadzley Abu Bakar, Mohd Basri Ali, Nur Ana Rosli, Shaiful Anwar Ismail, Siti Rahmah Shamsuri & Umi Hayati Ahmad</i>	600
157	GEO-ATTENDANCE & ENGAGEMENT ANALYTICS DASHBOARD: A LOW-CODE SAAS FRAMEWORK FOR EQUITABLE TVET ENGAGEMENT <i>Safiza Suhana Kamal Baharin, Arief Muizzuddin Khalid & Abdul Hadi Mazbah</i>	604
158	SMART FINANCE: AN AR-BASED INNOVATION FOR YOUTH ENTREPRENEURSHIP <i>Sarimah Surianshah, Salmah Topimin & Ho Chong Mun</i>	608
159	WRITERIGHT AI COACH: THE SMART, SUPPORTIVE AND ALWAYS-ON MUET WRITING COMPANION <i>Masdini Harina Ab Manan, Faharol Zubir, Belinda Marie Balraj & Najjah Salwa Abd Razak</i>	612

BLENDING RESEARCH, ARTIFICIAL INTELLIGENCE, & NEUROSCIENCE: ADVANCING INNOVATION DESIGN (BRAIN-AID)

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Abstract

This project presents an AI-enhanced e-learning ecosystem for the course KMF1053 Cognitive Neuroscience, developed to transform student engagement and connect theoretical concepts with real-world applications. Traditional lecture-based approaches often limit active participation and restrict opportunities for students to apply neuroscience knowledge meaningfully. To overcome these challenges, the course integrates AI-driven innovations such as Curipod for interactive lessons with real-time feedback, Wix e-Portfolios with AI-assisted infographic design, AI-powered video platforms (Wave.video, Flexclip, InVideo) for start-up pitching, and AI-enabled reflection analysis. The activities were closely aligned with the course learning outcomes. For CLO2, which emphasizes demonstrating the roles of the brain in relation to human behaviours, perceptions, and higher mental functions, students engaged in Curipod activities that required them to propose neuroscience-based strategies for improving attention while explaining the underlying brain mechanisms. Curipod's AI clustered responses and provided immediate feedback, enhancing conceptual understanding and fostering deeper engagement. This activity resulted in a 98.67% achievement of CLO2. For CLO3, which focuses on discussing the biological stages and mechanisms of the brain in relation to cognitive functions, students created infographic-based e-Portfolios using Wix AI tools to present neuroscience case studies. They also designed neuroscience-based products and tools, such as neurofeedback applications and cognitive training solutions, and pitched these innovations through AI-generated videos enriched with animation, voiceovers, and professional storytelling. Together, these activities reinforced conceptual understanding (CLO2) while deepening students' ability to critically discuss brain mechanisms in relation to cognitive functions (CLO3), achieving a 100% attainment of CLO3. The outcomes demonstrate increased engagement, creativity, and critical thinking, alongside stronger digital and AI literacy. Students mastered neuroscience content while cultivating transferable skills in innovation, entrepreneurship, and scientific communication. This initiative highlights the potential of integrating AI-driven platforms into teaching and assessment to create transformative, scalable learning experiences. It also contributes directly to the United Nations Sustainable Development Goals, including SDG 3: Good Health and Well-being, SDG 4: Quality Education, and SDG 9: Industry, Innovation, and Infrastructure. The project exemplifies how AI-enhanced pedagogy can enrich neuroscience education while advancing transformative education goals at both institutional and global levels.

Keywords: AI-enhanced e-learning, Cognitive Neuroscience, Curipod, e-Portfolio, Start-up Pitching, Reflection

BACKGROUND OF THE RESEARCH / INNOVATION / INVENTION / DESIGN

Teaching Cognitive Neuroscience has traditionally relied on lecture-based delivery, where complex concepts such as attention, perception, and higher mental functions are explained through static content. While this method ensures coverage, it often limits student engagement, critical thinking, and the ability to translate theory into practice. Students struggle to see the relevance of neuroscience in everyday contexts and may lack opportunities to apply their knowledge in creative or entrepreneurial ways.

In response to these challenges, *KMF1053 Cognitive Neuroscience* was redesigned into an AI-enhanced e-learning ecosystem named **BRAIN-AID** (Blending Research, AI, and Neuroscience – Advancing Innovation Design). The project integrates multiple AI platforms to enrich pedagogy, foster creativity, and promote deeper learning.

Key innovations include the use of Curipod, where AI generates and clusters student responses in real time, providing instant feedback that strengthens conceptual understanding of brain functions. Wix AI tools were adopted for infographic-based e-Portfolios, enabling students to creatively present neuroscience case studies while developing digital literacy. To foster entrepreneurship, students designed neuroscience-based products and pitched them using AI-powered video tools (Wave.video, Flexclip, InVideo) with AI-driven animation, voiceovers, and storytelling. Reflective activities further incorporated AI to analyze patterns in student insights and emotions, helping them make sense of their learning journey.

This innovation aligns with IUCEL 2025's theme of AI-enhanced e-learning, demonstrating how artificial intelligence can serve as an active pedagogical partner. By embedding AI at multiple stages, namely lessons, assessments, reflections, and entrepreneurial applications; the project produced a transformative learning model that not only improved learning outcomes (CLO2: 98.67%, CLO3: 100%) but also cultivated transferable skills in creativity, innovation, and start-up thinking.

DESCRIPTION OF THE RESEARCH / INNOVATION / INVENTION / DESIGN

BRAIN-AID is structured as an integrated ecosystem of AI-enhanced teaching and learning activities that moves students progressively from knowledge acquisition to application and innovation. The first component is the use of Curipod for interactive lessons, where students respond to neuroscience-based questions on topics such as attention. The platform's AI analyzes and clusters these responses in real time, providing adaptive feedback that allows students to see connections between their ideas and the underlying neuroscience concepts. This process not only deepens conceptual understanding but also enhances engagement by giving students an immediate sense of how their thinking aligns with established research.

The second component is the development of e-Portfolios using Wix AI tools. Here, students are tasked with solving neuroscience case studies and presenting their solutions in infographic form. The AI-assisted design features within Wix guide students in producing professional, visually appealing, and scientifically accurate outputs. This activity strengthens digital literacy while also cultivating the ability to communicate complex neuroscience mechanisms clearly and effectively to diverse audiences.

Entrepreneurship is fostered through the third component, where students collaborate in groups to design neuroscience-based innovations such as cognitive training applications or neurofeedback tools. These projects culminate in a start-up pitching exercise modelled on the

Shark Tank format. To present their ideas, students employ AI-powered video platforms such as Wave.video, Flexclip, and InVideo, which provide advanced features like automated voiceovers, animations, and storytelling support. This integration of entrepreneurship with AI technology encourages students to apply theoretical neuroscience knowledge in creative, impactful, and market-oriented ways.

The final component centers on AI-supported reflections. Students document their insights and experiences throughout the course, and AI is used to analyze these reflections for patterns in emotional and cognitive learning. This reflective process allows both students and educators to identify growth, challenges, and emerging themes, turning individual learning into a collective source of insight.

Together, these components create a holistic AI-supported pedagogy that transforms the teaching of neuroscience from a content-heavy lecture model into an interactive, applied, and innovation-driven learning experience.

SIGNIFICANCE OF THE RESEARCH / INNOVATION / INVENTION / DESIGN

The significance of this innovation lies in its ability to transform the teaching and learning of neuroscience into an engaging, adaptive, and future-oriented experience. By positioning AI as an active partner in pedagogy, BRAIN-AID addresses the long-standing challenges of passive learning and limited student application of theory. Instead of simply receiving information, students are guided through interactive processes where their responses are immediately analyzed, clustered, and contextualized by AI. This adaptive feedback mechanism strengthens mastery of neuroscience concepts by allowing students to see, in real time, how their understanding aligns with scientific principles and where improvements can be made.

Beyond reinforcing disciplinary knowledge, the innovation also places strong emphasis on creativity and entrepreneurship. Through the start-up pitching activity, students move beyond theoretical exercises to envision practical applications of neuroscience in products, tools, and services. The integration of AI-powered video production tools enables them to present their innovations in a professional format, which nurtures entrepreneurial thinking and exposes them to real-world modes of communication and persuasion. This positioning of students as active innovators rather than passive learners broadens their learning experience and equips them with the mindset required to contribute meaningfully to society.

Equally significant is the cultivation of transferable 21st-century skills. By engaging with AI tools such as Curipod, Wix, and AI-driven video platforms, students enhance their digital literacy and learn how to collaborate effectively in group projects that require problem-solving and creativity. These competencies are not only critical for academic success but are also essential for future workplaces where interdisciplinary collaboration and digital innovation are increasingly valued.

In essence, the significance of BRAIN-AID lies in its dual contribution: it deepens the mastery of neuroscience while simultaneously preparing students with the skills, confidence, and entrepreneurial mindset to thrive in an AI-driven future.

IMPACT OF THE INNOVATION/INVENTION/DESIGN TOWARDS EDUCATION OR COMMUNITY

Educationally, the innovation resulted in higher engagement, improved learning outcomes, and enriched digital competencies. Students not only mastered neuroscience content but also

achieved outstanding performance in the course learning outcomes, with 98.67% attainment for CLO2, which focused on demonstrating the roles of the brain in relation to human behaviours, perceptions, and higher mental functions, and 100% attainment for CLO3, which emphasized discussing the biological stages and mechanisms of the brain in relation to cognitive functions. At the same time, they developed entrepreneurial skills that are transferable across disciplines and professional domains.

For the community, the student start-up ideas have potential applications in mental health, education, and wellness, particularly in addressing issues such as stress management, attention training, and digital well-being. These innovations open opportunities for collaboration between universities and communities, fostering youth-led projects that are socially relevant and responsive to real-world challenges.

COMMERCIALIZATION POTENTIAL

BRAIN-AID has strong commercialization potential through its adaptability and relevance to current educational needs. The AI-enhanced teaching modules can be scaled and applied across different courses and institutions, offering a transferable model for digital pedagogy. The entrepreneurship component has also generated neuroscience-inspired start-up ideas, such as cognitive training platforms and neurofeedback tools, which could be refined into marketable applications addressing health, education, and well-being. Furthermore, the expertise gained from integrating AI into teaching can be transformed into workshops and training packages for educators, responding to the growing demand for AI-enhanced pedagogy. Collectively, these avenues highlight the sustainability and scalability of the innovation beyond its initial implementation.

CONCLUSION

BRAIN-AID exemplifies how AI-enhanced pedagogy can enrich neuroscience education by embedding AI into lessons, assessments, reflections, and entrepreneurial activities. It not only improved academic performance but also cultivated innovation, creativity, and start-up thinking among students. The project contributes directly to the United Nations Sustainable Development Goals (SDG 3: Good Health and Well-being, SDG 4: Quality Education, SDG 9: Industry, Innovation, and Infrastructure), advancing transformative education at institutional and global levels.

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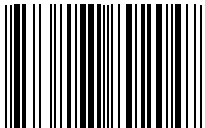
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