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Proceeding of

International University Carnival on E-Learning

IUCEL2025

INTERNATIONAL UNIVERSITY CARNIVAL ON E-LEARNING

" Embracing AI for Innovative Learning and Inclusive Education "

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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).

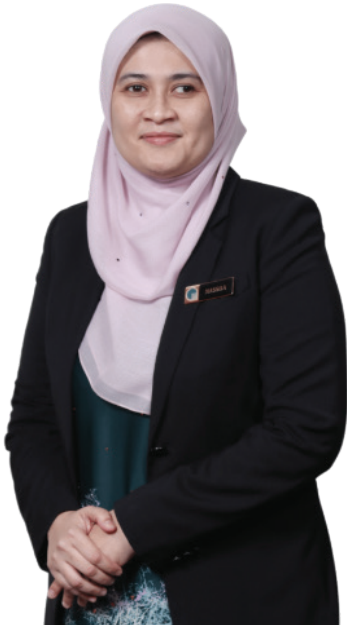
Held on 13 November 2025, IUCEL2025 brought together 196 e-learning innovators from 26 institutions. All presenters were invited to submit extended abstracts in August 2025. After a thorough evaluation and peer-review process completed in September 2025, a total of 160 articles were accepted for inclusion 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

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

Ross Azura Zahit*
Faculty of Cognitive Sciences and Human Development, Universiti Malaysia Sarawak, Malaysia

*Corresponding author's email: zrazura@unimas.my

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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