Research

DEWBoard Clinches Best of the Best Award at CITREX 2025: Innovative Creation Enhancing Teaching Quality of Digital Electronics

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GAMBANG, 23 June 2025 – The research and innovation excellence of Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA) continues to receive recognition as yet another innovation by one of its lecturers has successfully made history at the Creative, Innovation, Technology and Research Exposition (CITREX) 2025.

A product named DEWBoard©, created by Nurul Wahidah Arshad, a lecturer at the Faculty of Electrical and Electronic Engineering Technology (FTKEE), was crowned the top winner in the staff category through the Best of the Best Award at CITREX 2025, surpassing hundreds of other products in the competition.

Nurul Wahidah Arshad also won the UMPSA Research Grant Award and the Arts and Tourism Cluster Award sponsored by Intellectours, a subsidiary of UMPSA Advanced.

According to Nurul Wahidah, DEWBoard© was developed as a response to the urgent need to address the challenges of teaching the Digital Electronics course, particularly among engineering students who require hands-on practical training.

“I developed DEWBoard©, a compact and user-friendly mini digital trainer designed to support the basic and intermediate concepts of digital logic through interactive and hands-on simulation activities.

“DEWBoard© has been applied in the BHE1213 course using an intermittent discussion approach to enhance students’ understanding.

“It enables students to build, test, and observe the results of digital circuit combinations such as AND, OR, and flip-flop practically without requiring complex laboratory equipment.

“With a combination of one main board, two modular experiment boards, and one interface board, DEWBoard© can be used immediately without complex wiring and does not rely on an oscilloscope or frequency generator,” she explained.

She added that this allows demonstrations to be conducted directly in the classroom without the need to go to the lab, thus enabling a more flexible and responsive teaching approach.

“The idea for developing DEWBoard© emerged in 2022 after receiving feedback from students through the university’s teaching evaluation system (EPAT), where they voiced the need to improve laboratory equipment.

“The suggestion from the then Dean of FTKEE, Professor Ts. Dr. Hamdan Daniyal, who wanted a dedicated teaching kit for each course under the Dual Degree Programme, also served as a major catalyst for the development of this product.

“With the UMPSA Teaching and Learning Research Grant received in 2023, DEWBoard© underwent six improvement phases until the latest version was completed in January 2025.

“We used the intermittent discussion approach in class to gradually combine theory and practical. The results were very encouraging, and students grasped the concepts more quickly,” she said.

This research project was not a solo effort but a collaborative success with fellow researchers from FTKEE, including Associate Professor Dr. Mohd Mawardi Saari, Nor Farizan Zakaria, Ts. Dr. Rohana Abdul Karim, Dr. Md Rizal Othman, and Azri Idris, as well as a final year project student, Nur Haziqah Rosli.

Feedback for continuous improvement was also obtained from instructors of courses related to Digital Electronics at FTKEE.

To further refine the packaging and design aspects of the product, they also sought consultation from Idris Mat Sahat of the Maker’s Lab, Faculty of Mechanical and Automotive Engineering Technology (FTKMA).

A set of DEWBoard© systems is estimated to cost RM500, and currently, 25 sets (100 units) are being prepared for use across all Digital Electronics-related programmes at FTKEE, encompassing the Diploma, Bachelor of Engineering, Bachelor of Engineering Technology, and Bachelor of Technology programmes.

A study on the effectiveness impact will follow this widespread use as part of a data-based assessment.

According to Nurul Wahidah, the long-term vision for this product extends beyond UMPSA.

“With the support of the received research grant, we plan to conduct demonstration and training sessions at TVET institutions both locally and abroad.

“This product not only saves cost and space but also improves teaching and learning efficiency in line with TVET principles and 21st-century education.

“It also aligns with the greening education agenda by reducing the need for high electricity usage and excessive lab equipment, thereby supporting sustainable teaching initiatives,” she said.

In addition to her success through DEWBoard©, Nurul Wahidah Arshad has an excellent track record in innovation, having previously produced Wireless Rain Gauge (Silver Medal Winner, CITREX

2023), Modern Archery Training Aid (MATA) (Gold Medal Winner, CITREX 2024), Active Lightboard Virtual Education (ALIVE) – Champion in the immersive virtual learning category at the AKRI 2024 (Special Award by the Minister of Higher Education: Curriculum Design and Innovative Delivery), and Makhraj Recognition System using MATLAB.

The Best of the Best Award she received this time is not merely a personal accolade but a tribute to the innovation culture continuously cultivated at UMPSA in supporting a knowledge- and technology-based national development.
She dedicated this achievement to her Engineering Education team members, students, faculty, and the university, which have consistently provided support and believed in the impactful research potential.

By: Naqiah Puaad, Centre for Corporate Communications

Translation by: Dr. Rozaimi Abu Samah, UMPSA Press

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