Research

UMPSA excels in research, driving Advanced TVET

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PEKAN, 9 October 2024 - Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA), now celebrating 22 years, continues to gain international recognition by advancing research in sustainable development and green technology, while also strengthening Advanced Technical and Vocational Education and Training (TVET), known as Advanced TVET.

UMPSA's Vice-Chancellor, Professor Dato' Ts. Dr. Yuserrie Zainuddin, emphasizes that the university's mission is to deliver education, research, and advanced technology services in collaboration with communities through a social entrepreneurship ecosystem. UMPSA prioritizes talent development, aiming to educate and empower both students and staff to reach their full potential.

"UMPSA is actively leading the latest industry-related research initiatives, positioning itself as a leader in delivering services to industry and the community based on its niche areas of expertise," Dr. Yuserrie stated.

"Our collaboration with industry aims to foster a two-way exchange of technical skills—enabling UMPSA's expertise to benefit the industry while also facilitating knowledge transfer from the industry back to UMPSA."

"All of this will contribute to building a knowledge-based economy where knowledge is harnessed to create products and services," he added.

He further stated that, over time, these efforts will cultivate a knowledge society—one that generates and shares knowledge to enhance human life.

"Aligned with the UMPSA Strategic Plan 2021-2025, we are dedicated to providing technical training, engaging in collaborative projects, advancing technical capabilities, and developing products that integrate UMPSA's and industry's unique expertise. This mutually beneficial relationship strengthens the ties between UMPSA and industry," he explained.

"Collaboration with industry also aims to enhance the industry's technical capabilities by leveraging the expertise and technology of UMPSA's academic staff.

"This growth in technical capability is evident when industries transition from using existing technology to adopting advanced technology transferred through UMPSA's expertise.

"This progress has been driven by two key performance indicators: the project to enhance community technology capabilities (Made in UMPSA) and academic staff who secure UMPSA-Industry matching grants," he noted.

Professor Dato' Ts. Dr. Yuserrie added that this collaboration, focused on upgrading the technological

capabilities of communities (whether industry or society), encompasses research and innovation activities between faculties or centers of excellence, in partnership with industries and agencies.

"For instance, researchers in Industrial Chemistry and Mechatronic Engineering have developed an odour detection device known as the Electronic-Nose (E-Nose).

"This UMPSA innovation has successfully assisted various industries in addressing issues related to volatile organic compounds, including the detection of scents such as perfume, cocoa aroma, and pollution-related odours in Malaysia and internationally.

"In fact, the primary function of this device is to identify odour sources and assess the quality of specific odours," he said.

He added that this solution not only saves time and reduces skilled labour costs but also improves detection accuracy.

"This approach similarly benefits manufacturing companies needing specialized technology, such as solutions to extend the life of consumables.

"Upgrading projects address industry challenges by introducing and implementing innovative methods," he concluded.

The University is committed to maintaining momentum in teaching and learning quality, as well as in research and high-impact publications in SCOPUS, WOS, ERA, and MyCITE-indexed journals and conferences produced by its academic staff.

To achieve these goals, the university will continue to advance strategic collaborations with industry partners and other universities, both domestically and internationally.

"UMPSA is dedicated to producing globally competitive, competent graduates with a commitment to sustainability, equipping them to be responsible citizens upon graduation," he said.

"These graduates will serve as quality human capital, highly skilled, trustworthy, and guided by integrity."

UMPSA invites prospective students and researchers to join the university and contribute to the shared vision of a sustainable future.

"The university’s entrepreneurial focus and production of research intellectual property will act as catalysts for the development of start-up and downstream companies, contributing not only to the growth of the nation's engineering and technical industries but also creating more job opportunities for UMPSA graduates and graduates from other institutions," he added.

In the long term, Professor Dato' Ts Dr. Yuserrie expressed hope that one day UMPSA alumni or members would achieve global recognition through prestigious awards such as the Nobel Prize, a vision he believes is attainable.

"Together, let us work and pray for this dream to come true," he said.

Startup Company

he establishment of issuing companies and start-ups is a key component of the UMPSA Strategic Objectives 2021-2025. To date, four university start-up companies have been established to commercialize products and leverage the expertise of academic staff.

The Microbiome Lab (TML)

The Microbiome Lab (TML) is a start-up founded by UMPSA lecturer, Ts. Dr. Hajar Fauzan Ahmad, specializing in microbial genome detection and functional analysis using next-generation sequencing (NGS) technology.

TML integrates high-precision short-read sequencing (Illumina) with long-read sequencing (Nanopore) to perform structural analyses of complex genomes.

Internationally, TML collaborates with the KWEF Foundation, Shiga University, and companies such as futureNRG, Quality Nature, and RadiCare in clinical waste management, as well as Wipro Winnox, FGV, and B-crobes in probiotic discovery.

Domestically, TML works with the Department of Environment and the Ministry of Health on studies of rare microbial infections and antimicrobial resistance (AMR), as well as conducting indoor air microbiome research in partnership with NIOSH.

In academia, TML collaborates with Universiti Kebangsaan Malaysia (UKM), Universiti Teknologi MARA (UiTM), UMPSA, International Islamic University Malaysia (UIAM), and Universiti Malaysia Sarawak (UNIMAS) on gut microbiome analysis for cancer detection, driving innovation that advances health and environmental sustainability.

Edgify Solutions Sdn. Bhd.

Edgify Solutions Sdn. Bhd. a start-up founded by UMPSA lecturer, Ts. Dr. Syafiq Fauzi Kamarulzaman, leads the development of smart systems based on edge computing technology (Edge Computing) for the integration of intelligence in smart city systems, smart agriculture and smart manufacturing.

Services offered include consulting, system development and analysis systems involving artificial intelligence and the Internet of Things. Among the services carried out, Edgify Solutions collaborates with several other local companies to solve the wild elephant crisis in Johor with the Ministry of Agriculture and Food Security, and upgrade the product packaging system with Kaneka (M) Bhd.

Laras Mechanics Sdn. Bhd.

Laras Mechanics Sdn. Bhd., founded by UMPSA lecturer, Ir. Dr. Fadhlur Rahman is a UMPSA start-up in the field of engineering equipment design, modelling, and analysis, with a focus on advanced ultrasonic equipment, digital plan systems, and mechanical controls.

The company specializes in system integration solutions, automation, providing comprehensive solutions to improve technology performance and reliability.

By using Finite Element Analysis (FEA) as its core strength, Laras Mekanika Sdn. Bhd. assess and optimize structural and system integrity in meeting industry standard specifications.

A commitment to innovative engineering and accurate analysis makes the company an essential partner for customers looking to advance their operations in the oil and gas, automotive and engineering industries that are dynamic every day.

Pretech Global Sdn. Bhd.

Pretech Global Sdn. Bhd. is an innovative start-up founded by Dr. Noormazlinah Ahmad, with a primary focus on sustainable agriculture, bio-products, and waste cycling through green sustainable technology.

The company's flagship product, Prepecto, is a prebiotic organic liquid fertilizer designed to improve soil health and plant growth by stimulating beneficial microorganisms through natural enzymatic processes.

Prepecto offers an environmentally friendly alternative to traditional chemical fertilizers and makes it suitable for commercial farms, organic farming, and home gardening.

Pretech Global has collaborated with several international companies and institutions that have indirectly raised the company's name and products in the eyes of the world, among them Agrico in Qatar, Indonesia, and several other industry representatives in Kuwait and Oman.

In addition, Pretech Global actively collaborates with domestic companies and industries such as the Malaysian Pineapple Industry Board (LPNM), the National Farmers' Association (NAFAS), LKPP Corporation Sdn. Bhd, Peat Organic Sdn. Bhd, and HICOM to support and elevate the local economy through sustainable green technology.

Advanced TVET by 2030

UMPSA will produce a skilled workforce available to the industry with the establishment of an Advanced TVET Centre that provides TVET Teaching Competency training to meet the requirements of the TVET Programme Accreditation Code of Practice or Code of Practice for TVET Program Accreditation (COPTPA) and the industry.

The university is also leading the Digital TVET initiative at the national level by providing facilities and skills of specialist teaching staff in addition to improving TVET-based facilities through the empowerment of the Teaching Factory function at UMPSA towards becoming an Industrial Teaching Factory (ITF).

In preparation for the industry-driven TVET programme, UMPSA also implements the Apprenticeship Programme in collaboration with all relevant industries and the implementation of the 2U2i Industrial Mode Programme (WBL) which is an academic programme that is used as a concept of two years in university and two years in industry.

The International TVET rating or International Accreditation, Asia Pacific Accreditation & Certification Commission will contribute to efforts in increasing engagement with local and international multinational companies.

To enhance graduate employability, UMPSA is strengthening its efforts through industry collaborations. The establishment of the UMPSA Bosch Rexroth Academy as a Training Centre for the IR4.0 Certification Programme will greatly benefit students pursuing certifications in Industrial

Automation, Control, and Drive, in line with the demands of Industrial Revolution 4.0 (IR4.0).

UMPSA is the only public university (UA) in Malaysia certified to receive the United Kingdom's Institute of the Motor Industry (IMI) International Certification as a hybrid and electric vehicle training centre.

UMPSA staff and students also benefit from enhanced international mobility opportunities, participating in short-term courses in TVET through UMPSA’s collaboration with the National Organization of Skilled Workers (Skilled Youth) and the BEIFANG Automotive Education Group (BAEG). This partnership in Technical and Vocational Education and Training (TVET) enables students and staff to undergo upskilling through mobility programs that offer TVET certification from training institutions or industries in China.

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