

# Technically adept, intellectually capable

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FOR the nation to move forward in tandem with the Fourth Industrial Revolution (IR 4.0) and beyond, there is a clear need for well-trained technical workforce with skills sets that are dynamic and future-ready as well as future-resilient.

Technical and Vocational Education Training (TVET) programmes have always been seen as the vehicle to prepare aptly-skilled human capital but somehow the general perception is that they fall short in terms of the level of skills and knowledge needed for the industry to thrive ahead.

Graduates who have qualified from TVET institutions previously do not have a clear career pathway to further their studies and secure jobs that are highly technical in nature.

To create more career pathways and opportunities for TVET students, the Education Ministry with the Malaysian Technical University Network (MTUN) comprising four universities — Universiti Tun Hussein Onn Malaysia (UTHM), Universiti Teknikal Malaysia Melaka (UTeM), Universiti Malaysia Pahang (UMP) and Universiti Malaysia Perlis (UNIP) — and the professional body for technologists and technicians, the Malaysian Board of Technologists (MBOT), have collaborated in establishing newly designed Bachelor of Technology Degree (BTech) programmes in specific technology fields.

Some universities have introduced several of the courses last month at the beginning of the 2019/2020 academic year while other universities will make the courses available in September next year.

According to MBOT president Tan Sri Ahmad Zaidi Yusoff, BTech programmes at MTUN are articulation programmes for TVET graduates with Diploma (Vocational Malaysia) (DVM), Diploma (Vocational Malaysia) (DVM) through Polytechnic (DVP), and those with Diploma (Vocational Malaysia) (DVM) or Diploma (Vocational Malaysia) (DVM) and Diploma



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PROFESSOR DATUK WIRA DR RANA ABDUL RAHIM  
UTeM vice-chancellor

Lanjutan (Vocational Malaysia) (DVM) from institutions under the Department of Skills Development, Ministry of Human Resources (MHRM).

The articulation process entails matching the course requirements and coursework at vocational colleges with that at higher education institutions. "We start enrolling students as young as 14, go to PMU/PT3 examination towards Diploma (Vocational Malaysia) (DVM) through Sekolah Menengah Kebangsaan (SMK) without SPM. This posed a problem for the graduates should they decide to pursue a Bachelor's degree and beyond at public universities. Other than that they often face difficulty in transferring from TVET-based education to an academic-based degree programme," he explained.

The entry level requirement for BTech programmes at MTUN is not based solely on SPM qualification, Ahmad Zaidi highlighted.

For DVM graduates, most of the candidates have taken the equivalent courses to SPM's Bahasa Melayu Ilin Sesiempat, namely Bahasa Melayu Ilin 3 as well as Sijarah Ilin 3. For DVM and DVM graduates, most of the students have taken SPM which includes Bahasa Melayu and Sijarah.

In any case, the newly building programme that MTUN has approved the students would be the one entering the future years of BTech studies.

MBOT through Technicians Act 2015 (Act 788) has established the Technology & Technical Accreditation Council (TTAC). This is a Joint Technical Committee with the Malaysian Qualifications Agency (MQA) to perform accreditation on professional, technical and technical programmes. The council has published a Technology & Technical Accreditation Manual 2018 (TTAC MANUAL) for a comprehensive guideline for education providers.



The curriculum is more practical and focuses on the challenges of the IR 4.0



ASSOCIATE PROFESSOR DR ANWAR MUZ SAHAR

BTech to design and develop their programmes in the advanced technological field," he said.

UnMAP Academic Management Office dean Professor Dr Anwar Muz Sahar said the availability of BTech programmes for DVM and DVM qualification holders is timely.

"It is estimated there are 50,000 students graduating with DVM and DVM every year. With the availability of BTech programmes, these students can obtain Bachelor's degree-level qualifications as per required to face the challenges of IR 4.0," he said.

**DIFFERENTIATION**

The main difference between BTech and conventional degree programmes is that the former were developed based on occupational requirement while the latter are more discipline-based, UTeM vice-chancellor Professor Datuk Wira Dr Rana Abdul Rahim explained.

In conventional degree, fundamental and technological courses such as mathematics, physics etc are taught separately. In BTech programmes, the focus is for a graduate to perform a task in the work environment. Hence fundamental and technological knowledge that is usually taught in different courses are embedded into a course on a particular competency set, he said.

For example, the illustrated that a BTech Welding programme comprises a course of Welding inspection that combines elements of mathematics, physics, material studies, and local laws accordingly rather than have the subjects taken in separate courses, as with conventional programmes.

UTHM vice-chancellor Professor Datuk Dr Rana Zaidi Yusoff explained that the current delivery or execution of BTech programmes was the adoption of Work Based Learning (WBL) in a dual-release manner. This means the students undergo their studies in two phases, two and a half years at university and another year to the industry.

The curriculum structure is towards preparing students into industry 4.0 in line with the Program Educational Objective, which is to produce technical, technopreneur and entrepreneurship. As such, the success rate of higher graduate

employability is ensured as the students will have a structured IQA, courses in the industry itself within a year before they graduate," he said.

He said another delivery approach as apprenticeship is still in the development progress. The idea is to have workers (app) add their qualifications by studying two days at university and working three days.

**COLLABORATION**

UMP Centre for Academic Innovation & Competitiveness (CAIC) director Associate Professor Dr Masid Rullin Mohamed, who is a director of the MBOT Technology and Technical Accreditation Department, explained that MBOT and the Ministry of Human Resources have been working closely to ensure the programmes are relevant accordingly.

"So far, the government has appropriated some budget for creating job opportunities of existing lecturers, ensuring training for industry workers, and the implementation of a newly developed concept of teaching factory — University Requisition Teaching Factory (URTF). Here, students are involved in industry production line, thus creating valuable experiential learning even before they graduate," he said.

He noted that MBOT has approached the Malaysian German Chamber of Commerce and Industries (MGCCI) to become a strategic partner to BTech at MTUN, so that the programmes can be further improved to meet the demand of industry.

"With MGCCI on board, all of its over 400 companies' partners would be willing to be part of the ministry's TVET empowerment agenda," he said.

To improve the quality of teaching and learning based on IR 4.0, Anwar said UnMAP is currently applying to develop a teaching plant through the URF effort.

"This involves practical sessions of industrial design, engineering design and 3D printing at this teaching plant," said Anwar.

UnMAP's Faculty of Engineering Technology has also applied for TVET transfer of technology (TOT) for sending lecturers to further enhance their knowledge and skills.

The main objective of this TOT is to equip professional certification for lecturers at the faculty. Some lab courses are also proposed to be opened into industrial laboratories, to enable professional certificates to be issued. Training to obtain a teaching professional certificate has also

**LIST OF BACHELOR OF TECHNOLOGY PROGRAMMES AT MTUN UNIVERSITIES**

No.	Name of Programmes	Session Available	
		Sept 2019	Sept 2020
1	Bachelor of Technology in Building Construction	UTHM	UTHM, UTM&P
2	Bachelor of Technology in Food Service Technology	UTHM	UTHM
3	Bachelor of Technology in Food Service Technology	UTHM	UTHM
4	Bachelor of Technology in Welding	UTHM, UTeM	UTHM, UTeM, UTM&P, UMP
5	Bachelor of Technology in Welding	UTHM, UTeM	UTHM, UTeM, UTM&P, UMP
6	Bachelor of Technology in Welding	UTHM, UTeM	UTHM, UTeM, UTM&P, UMP
7	Bachelor of Technology in Electrical System Maintenance	UTHM, UTM&P	UTHM, UTeM, UTM&P, UMP
8	Bachelor of Technology in Oil and Gas Facility	UMP	UMP
9	Bachelor of Technology in Oil and Gas Facility	UTHM	UTHM

Source: UTeM

MBOT

**BACHELOR OF TECHNOLOGY PROGRAMME DELIVERY**



Source: UTeM

MBOT



Launch of the MTUN Bachelor of Technology Programmes at Universiti Teknologi Pahang.

been proposed as one of the TOT TVET agendas to be implemented after the proposal is approved," he said.

At UTeM, Wafiq said since many-wide of understanding and eight letters at least with related industries have been signed.

The University-Industry partnerships include those with Siemens, Axson, Carrier, Fesco, Harville Hotel, NOSH, Binaan Denysa and Hyson. The approach of BTech programmes is to have 60 per cent work-based learning and 40 per cent theory," he said.

**EXPECTATIONS**

Director of UTeM's Academic Planning and Development Office Associate Professor Dr Muhammad Faris Miskin said with a BTech degree in hand, TVET graduates can also request for apprenticeship and adequate amount of salary support with the skills that they gain.

"It is believed that the competitive for fresh graduates to get a job has gotten tougher. Hands-on skills, experience and knowledge are what employers look for," he said.

Other than having more students enrolled in skilled courses, Ahmad Zaidi said it is also very important to get the students to further their studies so that they would be more intellectually engaged.



ASSOCIATE PROFESSOR DR MASID RULLIN MOHAMED



PROFESSOR DATUK DR NABILAH BANDY

In many aspects, "The graduates of these programmes are expected to be employed as soon as they graduate because the programmes are designed to fulfil the needs of the industry."

The launch of BTech programmes at MTUN reflects the government's commitment in promoting and acknowledging TVET as the driving force in the country's development. The curriculum is more practical and flexible to meet the challenges of the IR 4.0," he said.

As the primary professional body for TVET, he said MBOT supports TVET graduates as technologists and technicians that are readily accepted not just in the local but also the global industry.

"We are strengthening our footing in the international arena with our courses as follows in multilateral cooperation."

"To date, we have been accepted as professional signatory for Swiss Accredited International co-accreditation agreement for Information & Computing Technology programmes. MBOT has also taken a proactive step in proposing to promote the implementation of AFCEC Technology and Technicians Register (ATTR) which is anticipated to be launched next year when Malaysia hosts AFCEC 2020," he said.