

Transforming Technical and Vocational Education and Training to Meet Industry Demand

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I. INTRODUCTION

9.1 During the Tenth Plan, mainstreaming and broadening access to quality Technical and Vocational Education and Training (TVET) were undertaken to address industry needs for skilled workers. Measures were also undertaken to improve public perception towards TVET. These efforts resulted in the percentage of school leavers pursuing TVET after *Sijil Peperiksaan Malaysia* (SPM), increasing from 25% in 2010 to 36% in 2013. Transforming TVET is one of the game changers in the Eleventh Plan to meet the demand of industry and contribute towards economic growth in view of globalisation, knowledge economy, technology advances and global labour mobility. Focus will be given to transform the TVET delivery system and increase its attractiveness as a choice for another education pathway. A Malaysian Board of Technologist (MBOT) will be established to recognise the professionalism of TVET practitioners that will enable them to demand higher wages.

II. TENTH MALAYSIA PLAN, 2011-2015: PROGRESS

9.2 TVET development in Malaysia started 40 years ago with the establishment of 2 public institutions in 1964, and since then has increased to more than 500 public institutions, as shown in Box 9-1. Continuous promotions of TVET have resulted in an increased intake of students from 113,000 in 2010 to 164,000 in 2013. In January 2011, SkillsMalaysia was established as a dedicated unit to promote TVET and increase awareness of job opportunities for its graduates. Activities undertaken include conducting roadshows, media advertisement campaigns and skills competitions at local and international levels. The National Skills Competition is conducted yearly for local TVET students to showcase their innovations and winners represent Malaysia in International Skills Competitions.

**Box 9-1
TVET Progression in Malaysia**

Two public TVET institutions were established in Malaysia in 1964 to provide training for youth namely *Institut Kemahiran Belia Negara (IKBN) Dusun Tua* and *Institut Latihan Perindustrian (ILP) Kuala Lumpur*. Currently, more than 500 public TVET institutions provide multiple programmes at all levels of education as shown below:

1964	1969	1986	1998	2000	2004
<ul style="list-style-type: none"> ▪ IKBN Dusun Tua under MoYS, to provide skills training. ▪ ILP Kuala Lumpur under MoHR, to provide skills training. 	<ul style="list-style-type: none"> ▪ Ungku Omar Polytechnic under MoE, to provide TVET training. 	<ul style="list-style-type: none"> ▪ GIATMARA Pekan, and 2 other institutions under MARA, to cater skills training for the less academically inclined students. 	<ul style="list-style-type: none"> ▪ JMTi under MoHR, cooperation between Malaysia-Japan to provide TVET training for industry 	<ul style="list-style-type: none"> ▪ UniKL MiAT under MARA, to provide TVET training for higher education ▪ ADTEC Batu Pahat under MoHR, to provide high-skilled TVET training. ▪ Kolej Kemahiran Tinggi MARA Pasir Mas under MARA, to provide high-skilled TVET training. 	<ul style="list-style-type: none"> ▪ Kolej Pertanian Bukit Tinggi under MoA, to provide skills training in agriculture.



1968	1983	1992	1999	2001	2012
<ul style="list-style-type: none"> ▪ IKM Jasin under MARA, to provide skills training 	<ul style="list-style-type: none"> ▪ CIAST commissioned under the ASEAN HRD Project in collaboration with MoHR, for training of TVET instructors. 	<ul style="list-style-type: none"> ▪ GMI under MARA, to provide high-skilled TVET training. 	<ul style="list-style-type: none"> ▪ MTUN consists of 4 public universities to provide higher education for TVET 	<ul style="list-style-type: none"> ▪ Community College under MoE, to provide TVET training and lifelong learning ▪ Akademi Binaan Malaysia under CIDB, MoW for skills training in construction 	<ul style="list-style-type: none"> ▪ Vocational College, under MoE to provide TVET training for post-lower secondary students.

Note:

MoE	Ministry of Education	ADTEC	Advanced Technology Training Center
MoHR	Ministry of Human Resources	UniKL – MIAT	Universiti Kuala Lumpur – Malaysian Institute of Aviation Technology
MOYS	Ministry of Youth and Sports	CIAST	Centre for Instructor & Advanced Skill Training
MARA	Majlis Amanah Rakyat, Ministry of Rural and Regional Development	GMI	German-Malaysia Institute
MoA	Ministry of Agriculture & Agro-Based Industry	IKM	Institut Kemahiran MARA
MoW	Ministry of Works	KKTM	Kolej Kemahiran Tinggi MARA
ILP	Institut Latihan Perindustrian	MTUN	Malaysian Technical University Network
IKBN	Institut Kemahiran Belia Negara	CIDB	Construction Industry Development Board
JMTi	Japan-Malaysia Technical Institute		

9.3 In 2012, a TVET Taskforce jointly led by Malaysian Qualifications Agency (MQA) and Department of Skills Development (DSD) was formed as a platform for collaboration and coordination among TVET institutions including private institutions. One of the initiatives was the rationalisation of programmes offered by public TVET institutions to reduce duplication and wastage of resources as well as identify niche areas for specialisation.

9.4 Seven ministries oversee public TVET institutions including the processing of entrance applications, which led to multiple applications and duplication of offers. To streamline this process, in 2011, the role of *Bahagian Pengurusan Kemasukan Pelajar* (BPKP), formerly known as *Unit Pusat Universiti* was expanded to coordinate all applications to public TVET institutions. This led to a better distribution of intake to public TVET institutions and reduced overlapped offering among institutions to the same cohort of students.

9.5 The existing tracer study system to track progress of graduates was expanded and customised to public TVET institutions including standardisation of the study template and quality assessment criteria. In addition, a new initiative known as *Skim Kemahiran dan Kerjaya 1Malaysia* (SKK1M) was introduced in 2012 as a bridging programme for unemployed TVET graduates to secure employment and benefited 10,400 graduates.

9.6 During Tenth Plan period, focus was given to harmonising TVET curriculum to ensure it matches industry requirements. Twenty-two Industry-Lead Bodies (ILB) were established to develop National Occupations Skills Standards (NOSS) to ensure TVET curriculum development to meet industry requirements. A total of 582 NOSS and 16 Occupational Analysis were developed for reference by institutions. A databank known as *Sistem Kredit Kemahiran Malaysia* was launched in 2013, to record the skills and core competencies of technical and vocational practitioners which can be reviewed for accreditation under the *Malaysian Skills Certificate* (MSC).

9.7 The National Dual Training System (NDTS) which provides industry-oriented workplace training, benefited 63,000 employees since its introduction in 2004, with 38,000 benefiting during the Tenth Plan. The programme was extended to cater for school leavers, known as *Special NDTS* and benefited 12,835 youth from 2011 till 2014.

9.8 A big shift in the TVET delivery was the conversion of the existing 72 vocational schools and eight technical schools run by the Ministry of Education into vocational colleges, as well as the setting up of eight new colleges. These new institutions offer students the opportunity to begin TVET education as early as 16 years old and to graduate with a diploma. From 2011 to 2014, 19,747 students enrolled, with the first batch of 2,700 students expected to graduate in 2016. The vocational college programme is also offered in partnership with other public TVET institutions including *Institut Latihan Perindustrian* (ILP).

9.9 The capacity of the Centre for Instructor and Advanced Skill Training (CIAST) under the Ministry of Human Resources (MoHR) has been expanded by establishing eight new satellite campuses in existing public and private institutions. This has resulted in doubling the number of instructors with Vocational Instructor Certification (VIC) from 1,462 in 2010 to 3,063 in 2014 as shown in *Exhibit 9-1*.

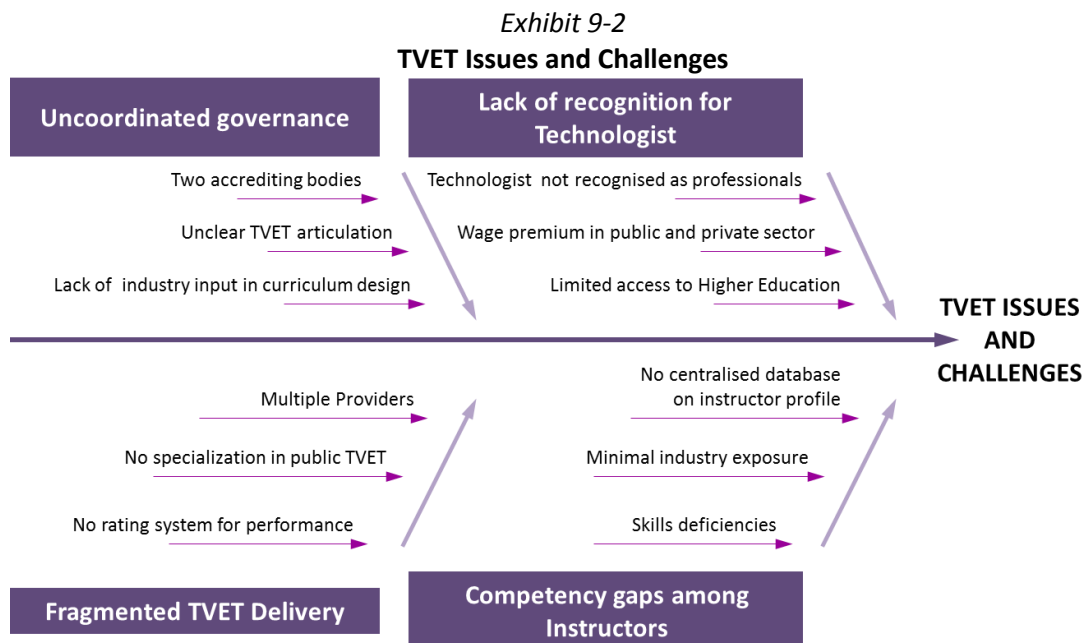
Exhibit 9-1
Vocational Instructor Certification (VIC)

Programme	2010		2014	
	No.	%	No.	%
Advanced VIC Diploma (Main campus)	163	11.2	197	6.4
Advanced VIC Diploma (1 Satellite)	-	-	21	0.7
Diploma VIC (Main Campus)	1,246	85.2	2,073	67.7
MSC Level 3 with VIC (Main campus)	53	3.6	152	5.0
Diploma VIC (7 Satellite)	-	-	580	18.9
Diploma VIC (Satellite-Industry)	-	-	40	1.3
Total	1,462	100	3,063	100

Source: Centre for Instructor and Advanced Skill Training (CIAST)

III. ISSUES AND CHALLENGES

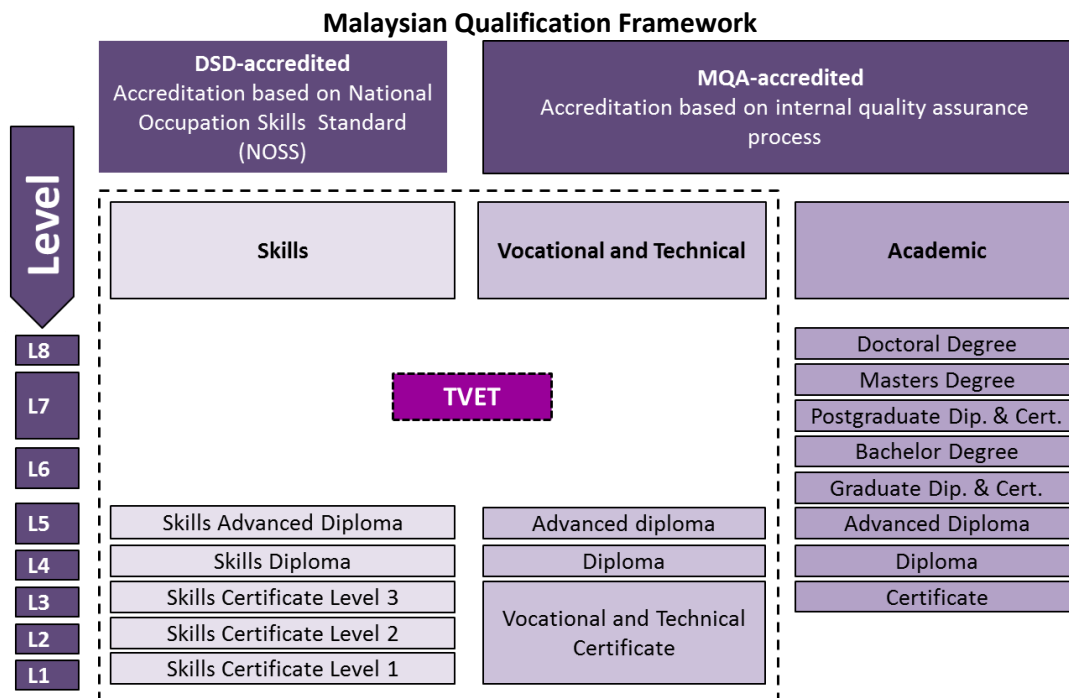
9.10 Even though efforts to mainstream TVET have been successful, four challenges need to be addressed, namely uncoordinated governance, fragmented delivery, lack of recognition for technologists and competency gaps among instructors, as summarised in *Exhibit 9-2*.



Uncoordinated Governance of TVET

9.11 Based on the Malaysian Qualification Framework (MQF), accreditation and quality assurance of TVET programmes are under the purview of two agencies, namely MQA and DSD as shown in *Exhibit 9-3*. MQA under the Ministry of Education (MoE) accredits vocational and technical programmes offered by institutions such as Polytechnic, Community College and MARA Institutions. DSD under the MoHR accredits skills training programmes offered by institutions such as ILP and IKBN. The existence of two different accrediting bodies for TVET has led to confusion and concerns about the varying quality of the programmes. Furthermore, mobility of TVET graduates for continuation of study between institutions under different accrediting agencies is limited.

Exhibit 9-3



9.12 TVET diploma graduates accredited by DSD have limited access to continue their studies at degree level in institute of higher education (IHE) due to more emphasis on practical components, different quality assurance mechanism and the perception that these graduates are less academically inclined. On the other hand, TVET graduates accredited by MQA have more accessibility to pursue higher education in IHEs as their curriculum are inclined to the academic track. This has led to unclear TVET articulation.

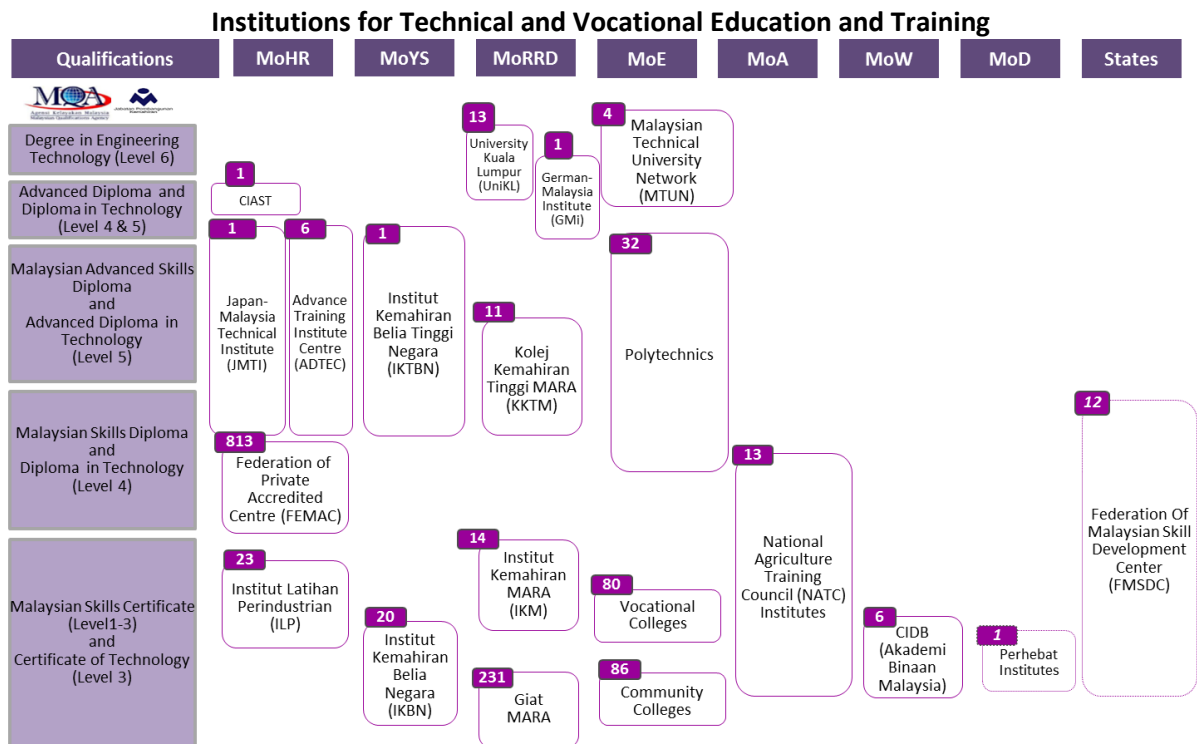
9.13 Lack of industry input in curriculum design has resulted in mismatch of skills required by industry and the skills attained by TVET graduates. Industries demand for work-ready TVET graduates who are competent and multi-skilled. In addition, industries are burdened by multiple requests for collaboration from the multitude of TVET institutions, and have

highlighted the need for a coordinated platform for collaboration between industry and TVET institutions.

Fragmented TVET Delivery in Malaysia

9.14 TVET delivery is fragmented as it is offered by Government ministries and their agencies, universities, state skills development centers and privately owned institutions. There are 525 public training institutions under seven ministries namely the MoHR, MoE, Ministry of Youth and Sports (MoYS), Ministry of Regional and Rural Development (MoRRD), Ministry of Agriculture and Agro-Based Industry (MoA), Ministry of Works (MoW) and Ministry of Defence (MINDEF). These institutions continue to offer programmes that were introduced since their establishment and do not specialise based on their niche areas. In addition, there are 813 private institutions registered with DSD and 12 state skills development centers conducting TVET programmes with varying quality and standards. The Malaysian Technical University Network (MTUN) comprising four public universities, namely Universiti Malaysia Perlis, Universiti Malaysia Pahang, Universiti Teknikal Melaka and Universiti Tun Hussein Onn, offer degree qualification for TVET. Universiti Kuala Lumpur (UniKL) and German-Malaysia Institute (GMI) also provide private TVET higher education. The various institutions and qualifications offered are shown in *Exhibit 9-4*.

Exhibit 9-4



Note: The number in the blue box represent number of institutions under respective agency

9.15 Currently, there is no standardised system to evaluate the performance of public TVET institutions. The existing rating systems are limited to respective institutions such as Polytechnic Rating System (Polyrate) for polytechnics and Sistem Penarafan Kolej Komuniti (MySPEKK) for community colleges. For private TVET institutions, a star rating system for programme quality and institutional performance is conducted by DSD. This rating system for private institutions creates a positive environment for competition and helps to improve graduate employability.

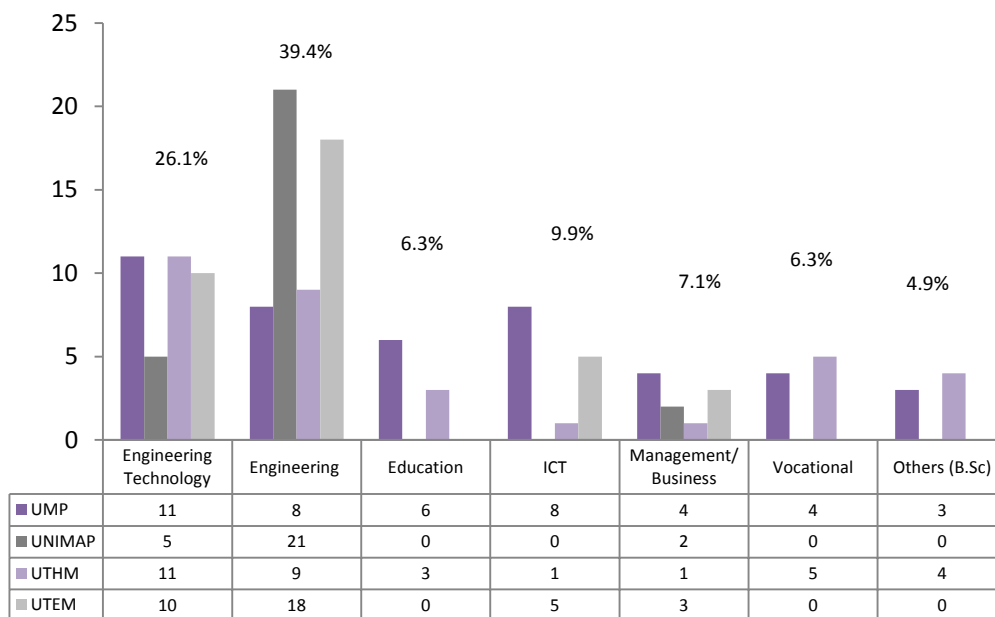
Lack of Recognition for Technologist

9.16 TVET graduates and practitioners are classified as technologists but are not recognised by the Board of Engineers Malaysia (BEM) as professionals under the Registration of Engineers Act, 1967. As such, technologists do not have professional status and hence cannot demand higher wages and career enhancement. In addition, TVET graduates with Malaysian Skills Certificate accredited by DSD receive lower wages as compared to graduates accredited by MQA.

9.17 The establishment of MTUN in 1999 was to provide an education pathway for TVET graduates to pursue degree qualification. Based on the target set, MTUN institutions were suppose to offer 51% of their degree programmes to TVET students. However, MTUN offers only engineering technology programmes to TVET students, represents 26.1% of all programmes in MTUN, as shown in Exhibit 9-5.

Exhibit 9-5

Distribution of Programmes in MTUN



Source: Malaysian Technical University Network, 2014

Competency Gaps among Instructors

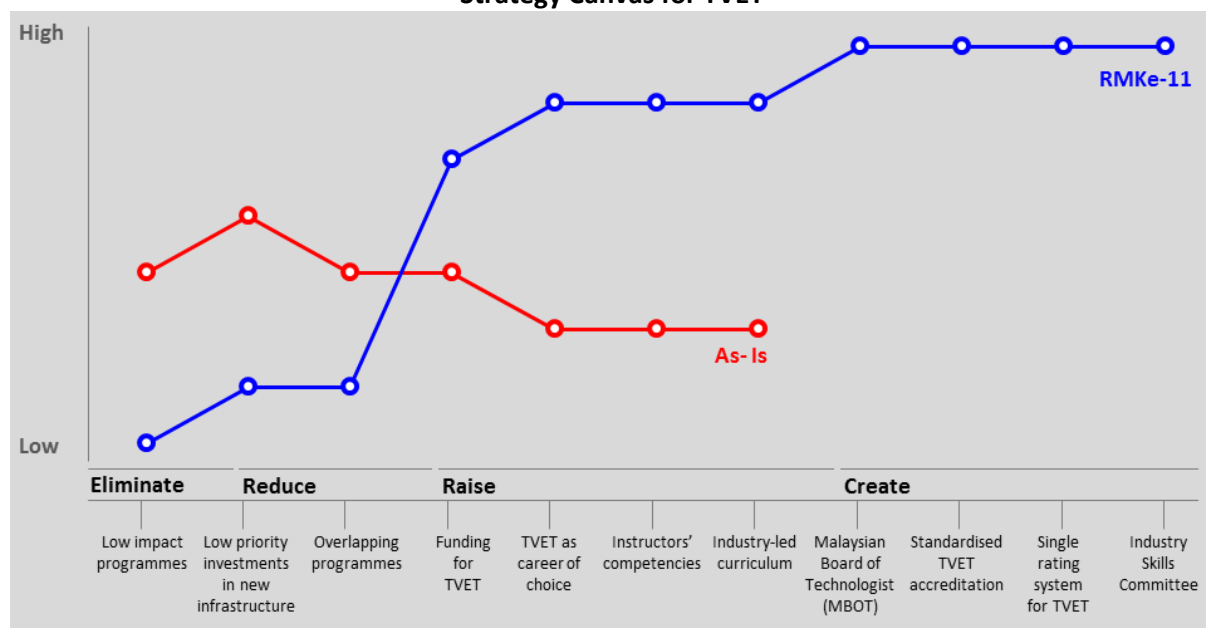
9.18 Through engagement with various stakeholders, it was highlighted that TVET instructors in public institutions are mostly lacking in skills and industry exposure. This has been attributed as one of the reasons that have hindered the effectiveness of training in meeting industry requirements.

IV. ELEVENTH MALAYSIA PLAN, 2016 – 2020: WAY FORWARD

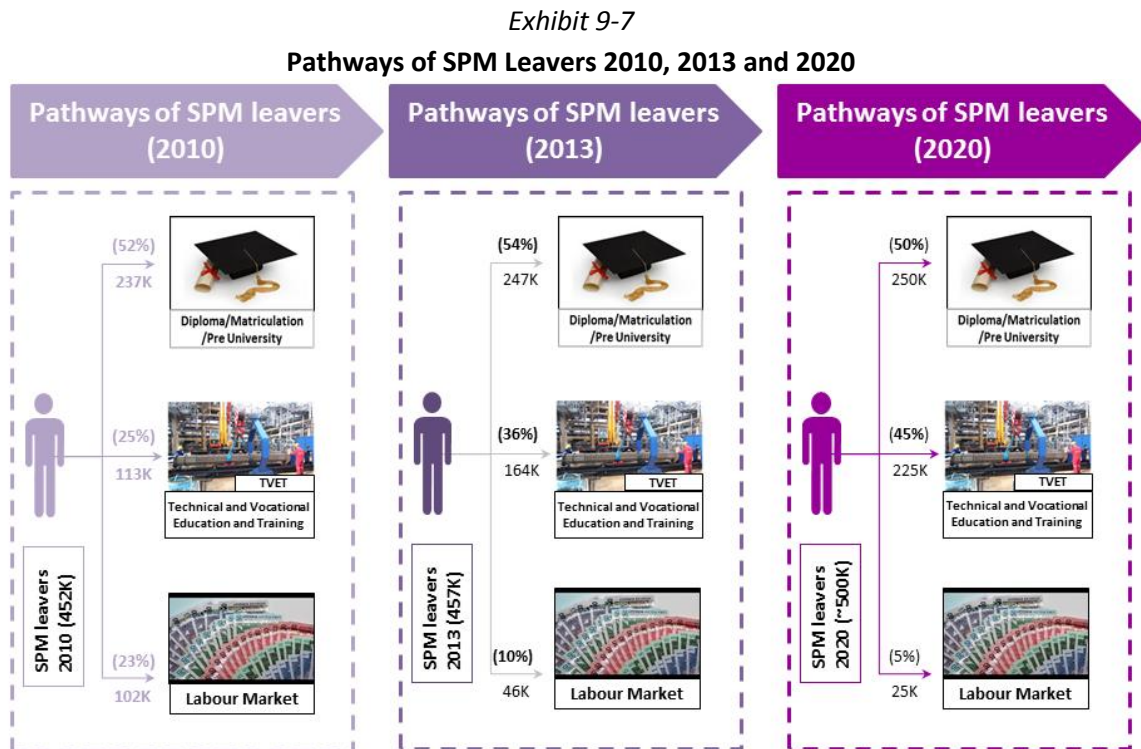
9.19 Transforming TVET by enabling industry led approach is crucial to produce skills human capital that meet the industry demand and support the migration of all economic sectors towards knowledge intensive activities, in line with the aspiration to become a high income nation by 2020. The Eleventh Plan will focus on 11 initiatives, as shown in *Exhibit 9-6*, clustered into three main strategies as follows:

- *Strategy 1:* Strengthening the governance of TVET for better management, through the streamlining of the national qualification framework, and harmonising of various rating systems across both private and public TVET institutions;
- *Strategy 2:* Enhancing the quality and delivery of TVET programme to improve graduates employability by enabling industries to lead curriculum development, eliminating the duplication of programmes and resources, enhancing cost efficiency and expanding funding for TVET to increase enrolment; and
- *Strategy 3:* Enhancing TVET branding to increase its attractiveness. This will be achieved through promotional activities highlighting TVET as an attractive career choice.

Exhibit 9-6
Strategy Canvas for TVET



9.20 By implementing these strategies, the projected number of TVET intake will reach 45% of the total SPM leavers by 2020 compared with 36% in 2013. This increase in access is expected to further reduce the SPM leavers joining the labour market without any skills training as illustrated in *Exhibit 9-7*.



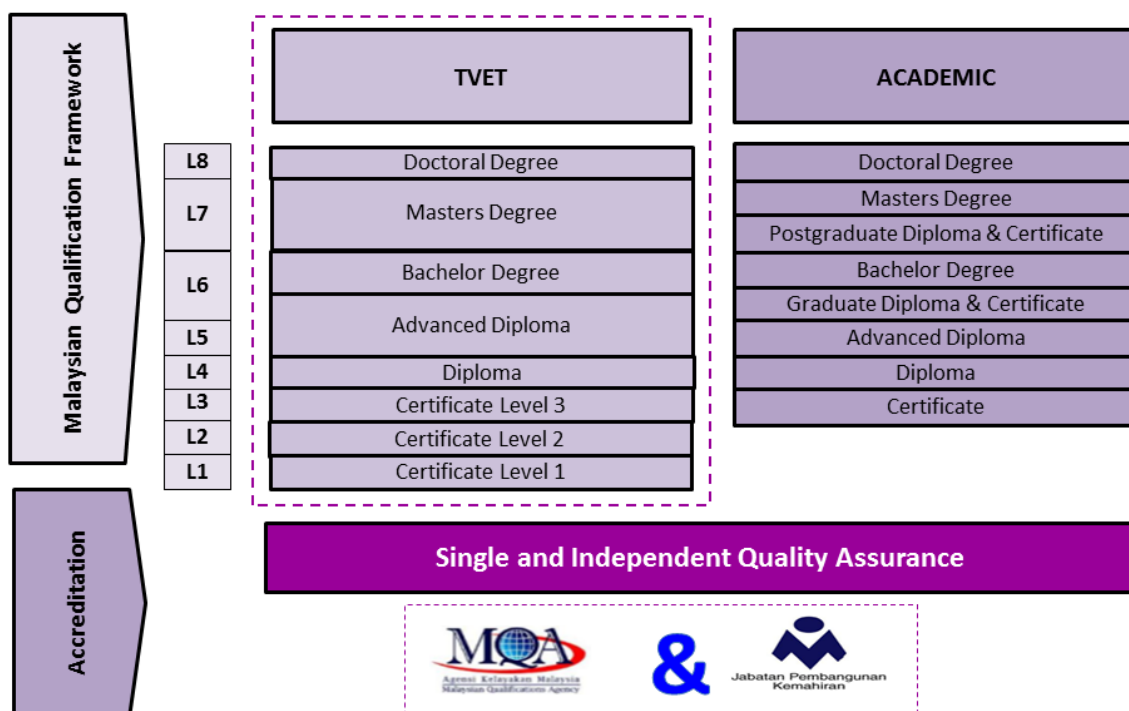
Strategy 1: Strengthening the Governance of TVET

Establishing a Single System for Accreditation

9.21 The current fragmented TVET sector will be consolidated through the establishment of a single system adopted by both MQA and DSD to facilitate better coordination and monitoring of the TVET sector. The new system will accredit TVET programmes offered by both public and private TVET institutions based on the revised MQF set out in *Exhibit 9-8*. This in turn will allow mobility of students between and amongst all TVET institutions.

Exhibit 9-8

The Revised Malaysian Qualification Framework



Harmonising TVET Institutions Rating Systems to Improve Comparability

9.22 The Government will harmonise the various rating systems across private and public TVET institutions into a single system. This includes rating systems such as the star rating system adopted by DSD for private TVET institutions, and the PolyRate and MySpeKK for public TVET institutions. This unified system will rate the quality of institutions and programmes based on outcome indicators such as graduate employability and industry engagement. Institution’s performance based on this rating system will be one of the factors to determine allocation of funds for the institution.

Strategy 2: Enhancing TVET Programme Quality and Delivery

Enabling Industry-led Programmes to Reduce Skills Mismatch

9.23 The Industry Skills Committee (ISC), in collaboration with industry players, will identify relevant competencies for each sector and sub-sector. New partnership models will enable industry to get involve at every step of the value chain, particularly in the design and delivery of the curriculum to ensure it is more hands-on and up-to-date. The new curriculum design will include apprenticeships, internships, practicum placements, and work-based

learning programmes. Industries will also continue to be incentivised to participate in apprenticeship programmes.

Strengthening TVET Curriculum

9.24 Under the Eleventh Plan, TVET curriculum will be strengthened to produce high quality TVET graduates that meet industry demand. TVET curriculum development will focus on critical and creative thinking as well as self-reliance learning among TVET students. “Problem, Project, Production” based learning modules which engage students in authentic, real world tasks intended to simulate actual workplace situations, will also be embedded in the curriculum to better prepare students for the working environment. The “Problem, Project, Production” based learning approach is as shown in *Box 9-2*.

Box 9-2

“Problem, Project, Production” Based Learning (PPP Based Learning)

Global economic challenges, rapid technology evolution, and domination of knowledge workers have a great impact on the learning process where what worked a decade ago in classroom teaching may no longer be useful to develop personnel who are versatile and importantly a lifelong learner. The approach is to complement existing training methods that emphasise on job competency. As a result, students will be creative, innovative with problem solving skills and more importantly, become autonomous learners.

PROBLEM	PROJECT	PRODUCTION
Exploring the problem to acquire and enhance knowledge, skills and attitude	Applying range of knowledge, skills and attitude to solve problems through project	Experiencing real life industrial activities using multi-disciplinary knowledge, skills and attitude

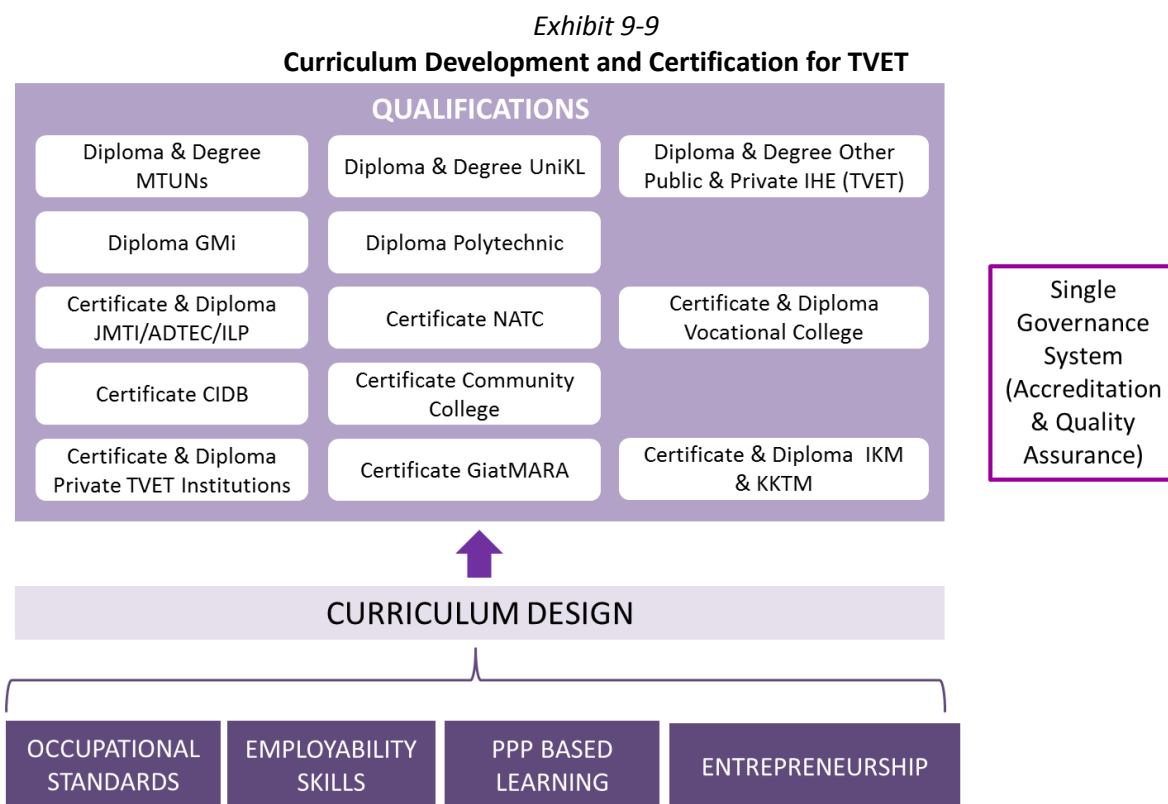
PPP Based Learning is an innovative instructional approach in a Student Centred Learning (SCL) environment that allows for flexible adaptation of guidance through problem solving, project works and real life production.

Among the organisations that have implemented PPP Based Learning are University of Cologne, Germany; University of Aalborg, Denmark; University of Victoria, Australia; University of Stanford, United State of America; and University of Manchester, United Kingdom.

Source: German-Malaysia Institute

9.25 TVET institutions will be allowed to develop their own curriculum based on occupational standards, which outlines the skills requirements of an occupation. Institutions will be encouraged to embed industry input in the curriculum to ensure their graduates match the skills requirements of industry. In addition, entrepreneurship will also be embedded in the curriculum to promote self-employment and enhance graduate resilience upon entering labour market. The development of occupational standards will be continuously reviewed to keep pace with changing technological and industry requirements.

At the same time, the quality assurance and accreditation of TVET by MQA and DSD will be harmonised based on a single governance system. *Exhibit 9-9* illustrates curriculum development for TVET sector.



Mainstreaming National Dual Training System (NDTS)

9.26 Concerted efforts will be undertaken to mainstream NDTS to produce skilled TVET graduates demanded by industry. NDTS offers workplace-based training wherein 70% of the training takes place at the company and 30% at TVET institutions. The 1MASTER NDTS programme will be further expanded to support specific economic development areas and industry needs. For example, a 1MASTER NDTS programme was established to specifically address the human capital needs of the Iskandar Malaysia Development Corridor. A special NDTS programme for youth who have dropped out of the education system will be expanded to increase access to training and certification. More public and private TVET institutions as well as industry will be encouraged to participate in NDTS.

Eliminating Low Impact Programme and Reducing Overlapping Programmes

9.27 Low impact programmes that are not in demand by industry and yield low graduate employability will be eliminated. The existing centralised system for tracer studies for public institutions will be upgraded and expanded to private institutions to enable comparisons of graduate employability. On top of these, more industry engagement in the form of

scheduled dialogues will be conducted for continuous programme assessment and validation. Overlapping programmes among public institutions will be reduced by encouraging them to specialise and create centres of excellence in niche areas of expertise in order to optimise resources and produce better student outcomes.

Enhancing Industry-based Programmes

9.28 Industry-based upskilling programmes will be strengthened to upgrade the skills of existing employees. For example, the Construction Industry Development Board (CIDB) and the Malaysian Automotive Institute (MAI) will initiate industry-based training in the construction and automotive industries. The Malaysian Meister Programme (MMP), which is adapted from the German-Meister Programme, will be introduced to provide skills enhancement training for experienced employees.

Optimising Resources for Better Return on Investment

9.29 The Government will prioritise improving existing institutions rather than investing in new ones. Similarly, the Government will prioritise buying places from good private institutions rather than creating new programmes, and will rationalise poor performing institutions. The concept will reduce the need for investment in new public TVET infrastructure and overcrowding of private TVET institutions. In addition, public and private TVET providers will be encouraged to share facilities, faculty and best practices, and to deliver their programmes as cost-efficient as possible.

Linking Funding to Demand and Performance

9.30 The Skills Development Fund (SDF) will continue to provide funding for students who pursue TVET programmes that are highly demanded by industry and delivered by TVET institutions with good performance ratings. The existing SDF loan mechanism for employee upskilling and reskilling will also be revamped to increase the number of recipients through a cost-sharing arrangement with industry. Fees in public TVET institutions will be standardised based on the type and level of programme.

Developing High Quality Instructors to Improve Delivery

9.31 Professional development programmes for instructors will be improved by incorporating more industrial training and attachment programmes. A centralised repository of instructor profiles will be established to identify competency gaps and enable the development of an effective training roadmap. Besides these, more industry experts

including retired industry practitioners will be encouraged to serve as TVET instructors through the provision of attractive remuneration packages.

Strategy 3: Enhancing TVET Branding To Increase Its Attractiveness

Promoting TVET as a Pathway of Choice

9.32 Promotions highlighting the potential of TVET as a career of choice with high income employment and entrepreneurship opportunities will be intensified through targeted media campaigns. SkillsMalaysia will drive a series of targeted media campaigns to educate school students and parents on the attractive career and entrepreneurship opportunities that TVET programmes can offer. Such promotional efforts will offer school students meaningful career guidance and showcase success stories. The MySkills Competition and international skills competition for TVET students will also be used as platforms to boost the image of TVET.

Recognising Technologists as Professionals

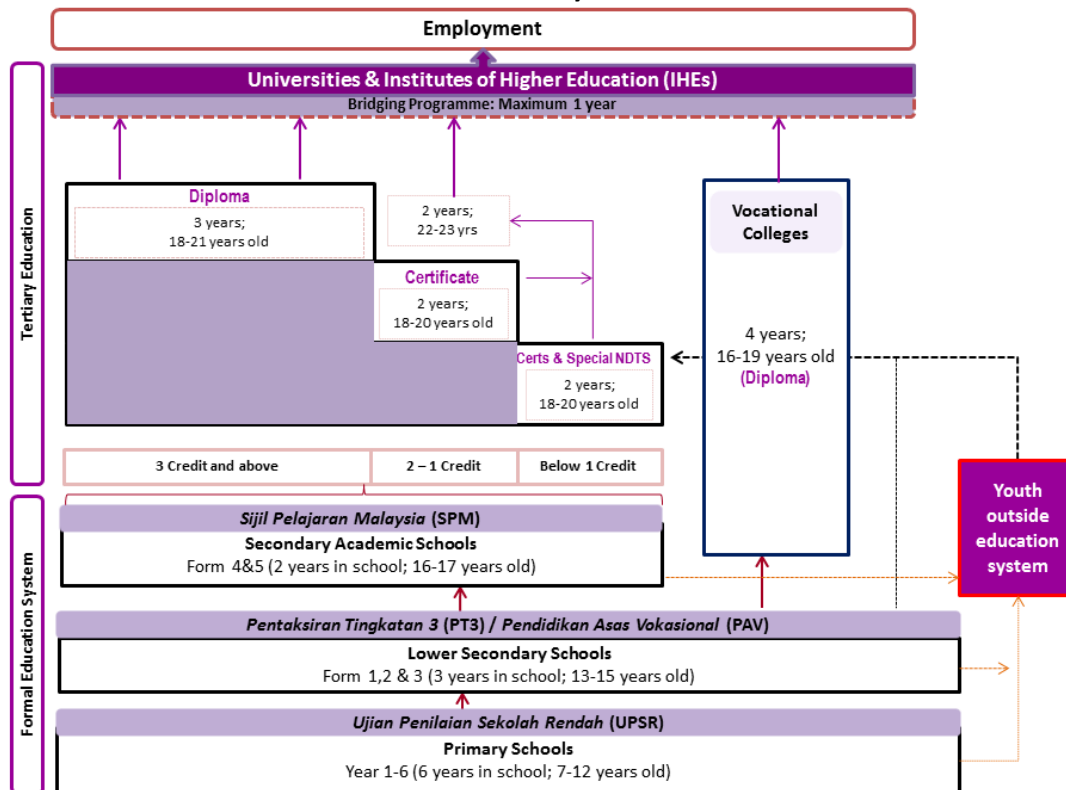
9.33 The Malaysia Board of Technologists (MBOT) will be established as an apex body to recognise the professionalism of technologists, similar to Board of Engineers (for engineering profession). MBOT will serve to elevate the technologist professional career advancement and for industry acceptance. MBOT will also provide advice on wage structure for technologists as reference for public and private employers. It will also be the professional body to govern professional ethics and conducts of technologists.

Clearer Education Pathways for TVET

9.34 The TVET sector will be streamlined to enable all students to pursue studies up to higher education level. There will be two tracks to enter TVET, namely after Sijil Pelajaran Malaysia (SPM) or Pentaksiran Tingkatan Tiga (PT3), as shown in *Exhibit 9-10*. SPM leavers with 3 credits and above will be able to further their study for a diploma, while those with 5 credits and above can opt for diploma in high skilled courses in areas such as aviation, biotechnology, marine engineering as well as oil, gas and energy. Two TVET programmes are also available for the less academically inclined students and youth outside the education system, namely certificate programmes and the special NDTs. Certificate programmes for these groups are offered by IKM, ILP, IKBN, National Agriculture Training Council (NATC), GiatMARA, *Akademi Binaan Malaysia* (ABM) and community colleges. The TVET education pathways framework will provide a clearer direction on opportunities available for TVET across all institutions.

Exhibit 9-10

Education Pathways for TVET Sector



Increase Employability of TVET graduates

9.35 Tracer studies conducted on graduates from public TVET institutions showed that the average employability rate within 6 months after graduation was 70-80%. Under the Eleventh Plan, these tracer studies will be strengthened and centralised as well as expanded to include private TVET graduates. SKK1M will be continued with embedded key performance indicators to improve employability of TVET graduates.

Expanding Accessibility of TVET Graduates to Higher Education

9.36 MTUN institutions will rationalise and realign the courses offered to cater for the expected increase in demand for TVET. The proportion of bachelor degree programmes in engineering technology offered in MTUN institutions will be increased from 26.1% in 2014 to 75% by 2020 to provide more opportunities for TVET diploma graduates to further their studies. Collaborations between UniKL and GMi with public TVET institutions will be expanded to provide additional capacity for higher education. In addition, masters and doctoral degrees in TVET will also be introduced to provide comprehensive articulations for TVET.

V. CONCLUSION

9.37 The Eleventh Plan will focus on several initiatives to harmonise delivery of TVET which is responsive to the changing economic requirements as well as demand driven and industry-led to ensure availability of quality skilled workforce. These initiatives will provide an enabling environment and a good support system to ensure the effectiveness of TVET. The expected returns are better employment opportunities and increased productivity of workers to uplift their living standards.