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Research Article

The Crucial Role of Polytechnics and Community Colleges in Overcoming Challenges to Empower TVET in Malaysia

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Abstract – Technical and vocational education and training (TVET) plays a vital role in developing a skilled workforce and supporting national growth, particularly in the Fourth Industrial Revolution. Malaysia has a well-established TVET system with 1,295 public and private providers. Polytechnics and community colleges are significant contributors, accounting for 45% of TVET enrolment and producing graduates with a marketability rate exceeding 90%. However, challenges persist in making TVET the primary education option in Malaysia. The country's TVET agenda faces governance, industry cooperation, quality accreditation, branding, and funding issues, which demand comprehensive solutions to produce competent graduates that meet industry demands. To overcome these challenges, the Malaysian government is taking initiatives to empower TVET through the establishment of the Malaysia Technical and Vocational Education and Training (MTVET) department, Global Institute of Training and Consulting (GITC), and Technical and Vocational Education and Training Council (TCH), as well as funding allocation. The government aims to enhance the standardization and quality of TVET, actively involve industries, and produce highly skilled graduates. In order to increase the number of youths interested in TVET, comprehensive campaigns and branding efforts are necessary. By doing so, TVET can become the top choice for preparing young people for the future. The successful implementation of the TVET Collaboration Hub is crucial in achieving these goals, and Polytechnics and community colleges are well-positioned to contribute significantly to this effort. By working together, all parties involved can support the development of a highly skilled and competitive workforce that can contribute to Malaysia's continued growth and success.

Keywords – TVET, Polytechnics, Community Colleges, Industry Cooperation, Skilled Graduates

I. INTRODUCTION

Technical and Vocational Education and Training (TVET) is an education and training process that focuses on employment and emphasizes industry practices in various related fields. In addition, TVET also covers various community skills development that will shape the field of TVET of a country. The United Nations Educational, Scientific and Cultural Organization (UNESCO) defines TVET as "an aspect of the educational process other than general education

that involves learning in related technologies and sciences, as well as training of practical skills, attitudes, understanding, and knowledge of employment in various economic sectors and social life [1].

TVET serves as an agent of change in producing highly skilled human capital and enhancing the competitiveness of the local workforce as well as being a driver of national development. Presently, the global manufacturing and services industry have entered the era of the Fourth Industrial Revolution (4IR). which will connect the real and virtual worlds [2]. This is also known as Cyber Physical Systems. Therefore, a qualified and skilled workforce is indispensable for the introduction and adoption of Industry 4.0. The technical knowledge required is high, and will be primarily recruited from the STEM (science, technology, engineering and mathematics) subjects, as well as TVET studies. However, for some years the number of STEM graduates has fallen below expectation. There is an urgent need to create a skilled and diverse workforce, with high salary, both by up-skilling the existing labour pool and by attracting and developing future talent in the manufacturing sector [3]. Particular attention also needs to be given to re-skilling and re-deploying lesser skilled workers to other sectors and activities.

More ever, Industry 4.0 is fundamentally reshaping the jobs landscape and will foster significant changes in how industrial workers perform their jobs. The Fourth Industrial Revolution is based on new technologies using automation, analytics and big data, simulation, systems integration, use of robotics, cloud computing, Internet of Things (IoT) and others. Entirely new jobs with very different skill requirements will be created, while others, especially manual tasks, will become obsolete. The shifting employment landscape has significant implications for industry, education systems, and the Government.

In the Eleventh Malaysia Plan (11MP), the government has identified several drivers of change that are innovative approaches to accelerate Malaysia's development to provide a highly skilled workforce. As many as 60% of the 1.5 million new jobs to be created require TVET -related qualifications [4]. This is in line with the country's goal of producing 35% skilled workers among the highly skilled workforce by 2020. Based on My Job Profile statistics from Department of Statistics Malaysia (DOSM) for the 4th quarter of 2021 & first quarter of 2022-The total vacancies for TVET as a whole was 69% (131,465/190,436) in the fourth quarter of 2021 and this rate decreased by 1% to 68% with comparison 108,616/159,148) job opportunities in the field of TVET in 2022 [5]. In this regard, TVET programs need to be strengthened and expanded to meet the needs of the market and in turn be able to produce quality and high value graduates in the job market. Therefore, efforts to strengthen the country's TVET must have strong support from all parties, including industry.

The Economic Transformation Program (ETP) (2020) has listed twelve 12 sectors of the National Key Economic Areas (NKEA) in the field of TVET that will grow significantly in the country to ensure that Malaysia remains relevant and not left behind to compete namely; oil, gas and energy, palm oil, financial services, tourism, business services, electrical and electronics, wholesale and retail, education, healthcare, communications content and infrastructure, agriculture, and Greater Kuala Lumpur/ Klang [6]. Therefore, Malaysia has and will continue to pay attention to the development of TVET with other developed countries as well as to meet the needs of the job market with producing quality and high value TVET graduates.

II. TVET Scenario in Malaysia

The development of formal TVET in Malaysia has begun since 69 years ago with the establishment of the Technical College in 1953, especially aimed to train natives [7] It then has progressed further by producing local graduates who are skilled in technical fields to help generate the economy and also the society. As a developing country, Malaysia is actively empowering the TVET system to meet the needs of various industries. To date, there are 1,295 public and private TVET providers across eleven ministries; including 22 state government TVET institutions that offering certificate, diploma, and degree levels studies throughout Malaysia [8]. This also includes the Ministry of Higher Education (MOHE), which offers the most TVET programmes to the highest number of students. Presently, qualifications for academic (higher education) and vocational

education sectors offered by MOHE's which inclusive of universities, polytechnics, and community colleges are accredited by the Malaysian Qualifications Agency (MQA) and Board of Engineer Malaysia (BEM). Whilst skills training programmes offered by skills training institutions are accredited by the Department for Skill Development (DSD) of the Ministry of Human Resources. Under 2022 budget, the government has allocated RM6.6 billion to empower TVET through various initiatives to be implemented by relevant ministries and agencies [9]. These initiatives, included of prepare graduates who fulfil the industry needs, enhance the quality of TVET institutes, strengthen programmes offered that are industry-oriented and boost the industry's active involvement. However, challenges in empowering or establishing TVET as the main option for education in the country still exist.

A. *POLYCC as TVET institution in empowering TVET ecosystem*

TVET at MOHE consists of 4 universities in the Malaysian Technical University Network (MTUN), 36 Polytechnics and 104 Community Colleges. The TVET program level at MOHE starts at the Community College which offers certificate and diploma level programs. On the other hand, Polytechnics offer study programs at the diploma and bachelor's level while MTUN offers undergraduates and postgraduates or diploma and up to the Doctoral programmes [10]. In term of institutional evaluation and program delivery, instead of accredited by Malaysian Qualifications Agency (MQA) and Board of Engineers Malaysia (BEM- Engineering Technology Accreditation Council ETAC/ Technology and Technical Accreditation Council (TTAC), some Malaysian Polytechnics have also received international accreditation from Asia Pacific Accreditation and Certification Commission (APACC) – such as PUO, PIS, PSA, PKB, PKU and POLIMAS. Thus, Ministry of Higher Education (MOHE) offers the most TVET programmes contributing to the highest number of TVET graduates, where polytechnics and community colleges are the largest TVET providers under MOHE. More than 120,000 students enrol in polytechnics and community colleges each year and it contributes to 20% or more [11]. In 2021 they contributed to 45% of country's TVET enrolment with a graduate marketability rate exceeding 90%.

At the POLYCC TVET institution level, which is subject matter and industry experts as the industry advisory committee (IAC) identify the skills development strategies required for future success in particular areas as well as to produce competent and holistic TVET graduates which are able to contribute to national development. In other words, The IAC Committee identifies strategies to meet the skills needed by the industries and the most importantly is the contribution that skills development can make to address those challenges. Through internship and apprenticeship, with work-based learning (WBL) approaches, this supports the formation of skills for which there is always demands in the employment market and this helps to avoid skills mismatches that contribute to unemployment, in particular among younger generations, thus "Right skills at the right time for the right person." As a result, the wage premium commensurate with the rising skills in Malaysia due to the increasing high skilled TVET manpower. Higher skills workers are better matched with the industry demands to support national economic growth [12].

III. ISSUES AND CHALLENGES

The government is aware of the importance of boosting TVET as institutions of excellence to produce superior human capital that is able to adapt to all the changes of globalization. Progressive measures must be designed and implemented comprehensively in achieving the national TVET agenda as well as fulfilling the desire to improve the value chain economy towards becoming a high -income country. However, behind the progress and achievements that have been made by the TVET providers in the process of its reform towards achieving 2030 goals, issues and challenges are inevitable. Here I would share various problems and issues existed and also the challenges to the implementation of TVET in Malaysia. The data is taken from the recommendations and findings based on the issues and challenges focused by TVET Empowerment Committee. It has been published in the book entitled *Pemerkasaan TVET di Malaysia – Satu Tinjuan* from MOHE updated July 2020. Those issues and challenges are focused on five areas

such as governance, Industry, Quality, Branding and Financing [12].

A. *Governance: Inconsistencies in the Governance of the Ministry of TVET Providers*

Inconsistency between National TVET providers across ministries are from roles, tasks, implementation, and operations. These have become a barrier to collaborating and sharing information. In addition, public TVET institutions established under the state government also lack involvement in the TVET agenda of the country as a whole. This subject to different laws according to the respective ministries. For example, the Education Act 1996 applies only to the Ministry of Education and the Ministry of High Education while the National Skills Development Act 2006 is only meant for the Ministry of Human Resources. There are other acts as well applicable under their respective ministries 9 based on to functions and roles. This creates a TVET ecosystem that is not harmonious in governance i.e. implementation and the operation of each public TVET institution is only in the scope of the ministry itself [12].

B. *Industry: Lack of Industry Cooperation with TVET Providers*

Referring to the 11MP as well, collaboration between the industry with TVET providers are still low and it is difficult to achieve the required level in the developing aspect of high-quality programs. A Research report by Khazanah Research Institute (KRI) stated that there was a mismatch between industry demands on the skills possessed by TVET graduates. This research supported by findings from the Department of Statistics Malaysia which has shown the percentage of working TVET graduates does not correspond to knowledge and skills required by the industry. This percentage of mismatch experienced an increase of 20.7% in 2016 compared to 12.3% in 2001. This is due to low level industry involvement in the curriculum development and sharing of expertise with TVET institutions [12].

C. *Quality: Differences in TVET Accreditation Standards*

There are two major TVET accreditation bodies in Malaysia, namely the Malaysian Qualifications Agency (MQA), under the Ministry Higher Education (MOHE) and the Department of Skills Development (JPK), under the Ministry of Human Resources (KSM). Both these accreditation bodies have their respective acts in performing the task of giving recognition to the TVET programmes. This situation causes a difference in terms of standards, accreditation systems and program quality [12].

D. *Branding: No Single TVET Brand*

Branding is very important in an effort to highlight the uniqueness of the brand it creates, in support from the set targets. Until now, there is still not a single specialty brand representing the national TVET brand. In fact, the existence of different branding for each ministry have caused confusion on national TVET brands. As for the example we have Skills Malaysia by the Ministry of Human Resources, TVET MARA by the Ministry of Rural Development and TVET by the Ministry of Education Malaysia, Ministry of Higher Education and the Ministry of Youth and Sports [12].

E. *Financing: Unsustainable of TVET Institutional Funding*

The field of TVET requires high allocation in the provision of quality learning infrastructures as to give the best output. These provisions include improvement of teaching staff skills, equipment, technology and student development. Through the 2020 Budget presented in 2019 by the Honourable Minister of Finance, the government allocated from RM5.7 billion in 2019 to RM5.9 billion in 2020 for TVET programs [12]. The government has also reduced the allocation for TVET development of RM300 million in the 10MP to RM200 million only in the 11MP. The reduction in government funding is an early sign to all TVET providers in Malaysia to be ready to change to sustainable TVET financing ecosystem. The impacts of government funding cuts are expected to make it difficult for TVET institutions to produce competent graduates to fulfill the demands of the industry. Public TVET institutions will also face challenges to update and improve teaching aids, improve the expertise of teaching staff and the facilities at these institutions [12].

IV. THE ROLE OF GOVERNMENT IN AN EMPOWERING TVET ECOSYSTEM IN MALAYSIA

To streamline the governance and coordination of TVET, the National TVET Council (MTVET)

or Majlis TVET Negara (MTVET) was established on 18 December 2020 by Datuk Seri Ismail Sabri Yaakob, our Malaysia Prime Minister [8]. The main purpose of MTVET Negara is to improve the coordination of the country's TVET ecosystem in an effort to ensure that TVET is a national agenda as well as empowering national TVET. MTVET functions as:

i. A high authority body to decide on the direction of TVET;
ii. A body to improve the standardization of TVET ecosystem through the involvement of public and private stakeholders;
iii. A government platform to empower TVET in developing highly skilled manpower, in-line with industrial's needs.

As the direction of the TVET empowerment agenda, Figure 1 below show 6 MTVET main initiatives have been proposed. The six initiatives are; develop policies in encouraging industry engagement (GITC), set up TVET Collaboration Hub (TCH), draft sustainable financing model, establish national TVET branding plan, set the standardization of TVET programme offering policy and develop one stop TVET data centre [10]

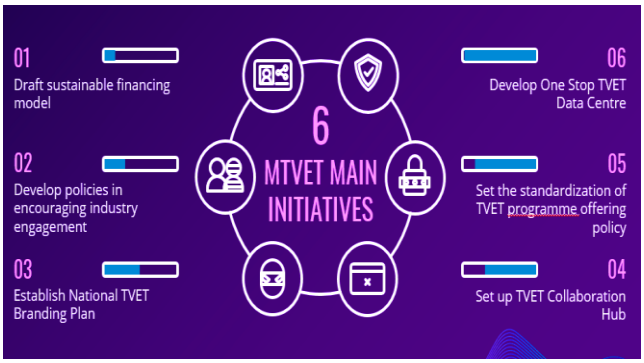

Fig. 1 Six MTVET main initiatives

From that, on 11 February 2021 Mesyuarat Majlis TVET Negara Bil. 1/2021, which was chaired by The Prime Minister Datuk Seri Ismail Sabri Yaakob agreed with the strategy and main initiative agendas in empowering national TVET. He has also endorsed 2 of 6 initiatives with the establishment of:

i. Government-Industry TVET Coordinating Agency (GITC);
ii. Implementation of the TVET Collaboration Hub (TCH).[13]

A. Government-Industry TVET Coordinating Agency (GITC)

Under Budget 2022, the government has allocated RM6.6 billion to empower TVET through various initiatives to be implemented by relevant ministries and agencies. These initiatives will provide graduates who meet the needs of the industry, improve the quality of TVET institutions, strengthen the offering of industry-oriented programs and intensify active industry involvement. 0n 3 February 2022 Prime Minister announced the establishment of government-industry TVET coordination body (GITC) that "will be directly involved in the development of the country's TVET human capital, particularly in relation to skills, and manpower requirements". The establishment of the industry -led GITC enables it and the government to shoulder the responsibility to enable TVET in every value chain to produce quality graduates.

Bil.	Ahli-ahli	Kluster (MSIC)
1	Federation of Malaysian Manufacturers (FMM)	*Manufacturing*
2	Malaysian Employers Federation (MEF)	Wakil Majikan
3	Federation of Malaysian Freight Forwarders (FMFF)	*Transportation and Storage*
4	Malaysian Association of Hotels (MAH)	*Accommodation and Food Service Activities*
5	Malaysia Semiconductor Industry Association (MSIA)	*Manufacturing – Electrical & Electronic*
6	Master Builders Association of Malaysia (MBAM)	*Construction*
7	Malaysian Oil and Gas Services Council (MOGSC)	*Electricity, Gas, Steam and Air Conditioning Supply*
8	The National Tech Association of Malaysia (PIKOM)	*Information and Communication*
9	Malaysian Palm Oil Council (MPOC)	*Agriculture, Forestry and Fishing*
10	Malaysia Retailers Association (MRA)	*Wholesale and Retail Trade*
11	SME Association	*Small and Medium Enterprises*
12	MPC Professional Services Productivity Nexus	*Professional Services and Other Services*

Fig. 2 GITC's membership consists of Twelve associations

Figure 2 shown the GITC's membership consists of Twelve associations based on the industry sector that have agreed together with 11 ministries to work together to achieve the national TVET agenda as coordinated by the MOHE [14].

B. Implementation of the TVET Collaboration Hub (TCH)

TVET Collaboration involves 11 ministries and is coordinated by the Ministry of Higher Education. TCH is The Center of Excellence or Centre of Technology in the TVET institutions, based on their achievements, recognition and criteria set by the respective Ministry. This initiative will be a platform for an ecosystem of strategic collaboration of expertise, equipment, technology and etc. between The Centre of Technology (COT) or Centers of Excellence (CoE)

in TVET institutions where government/regional economic as the enabler and industrial authorities as the benefactor. This is capable of being a driver to the national TVET empowerment agenda. A total of 14 TCHs have been identified (as shown in Figure 3), inclusive automotive, semiconductor, marine, air conditioning, aerospace, robotics, rail, telecommunications, hospitality and tourism as well as food technology to be implemented in the Peninsular, Sabah and Sarawak [14].

Four from the list of TVET collaboration HUB are from Malaysian Polytechnics. Those polys are Politeknik Sultan Azlan Shah as the Centre of Technology Automative & Manufacturing, Politeknik Ungku Omar as the Centre of Technology in Marine Engineering and Centre of Air-Conditioning and refrigeration and Politeknik Sultan Haji Ahmad Shah as the Centre of Food Science & Technology.

Three TCHs form The Ministry of Rural Development under Majlis Amanah Rakyat (MARA) such as: The Avionics and Satellite Communication System Integration Cluster, Malaysian Aviation Technology Institute, Universiti Kuala Lumpur (UniKL) MIAT; Industrial Automation and Robotics Cluster, UniKL MFI and Asian Rail Center, UniKL. Others are from UTeM, UTHM, UNIMAP and other ministries.

Fig. 3 GITC membership consists of twelve associations[14]

It is high time for TVET to become the top choice of youths in preparing themselves for the future as TVET has been proven capable of producing skilled, trained and entrepreneurial individuals. Realizing the importance of TVET, campaigns, promotions and rebranding efforts should be done comprehensively to eliminate the perception that TVET is an irrelevant second-class education. Hence, it is very important to make sure the TVET Collaboration Hub is a successful one. This is monitored thoroughly in the five aspects namely, collaboration, branding, financial, talent and quality. Figure 4 shows the five successful aspects of TVET Collaboration Hub in Malaysia as well as Polytechnic Malaysia.

Fig. 4 Five successful aspects of TVET Collaboration Hub [14].

V. CONCLUSION

TVET is vital for workforce and national development, particularly in the Fourth Industrial Revolution. Strong support from all parties is essential [7]. Malaysia has a well-established TVET system with 1,295 public and private providers. Polytechnics and community colleges contribute 45% of TVET enrolment, with a graduate marketability rate exceeding 90%. Challenges still exist in making TVET the primary education option [8].

Malaysia's TVET agenda faces challenges in governance, industry cooperation, quality accreditation, branding, and funding. These challenges require comprehensive solutions to produce competent graduates and fulfil industry demands. Malaysian government's efforts in empowering TVET through the establishment of MTVET, GITC and TCH, along with various initiatives and funding allocation, aim to improve the standardization and quality of TVET, involve industries actively, and produce highly skilled graduates. With comprehensive campaigns and branding efforts, TVET can become the top choice for youths in preparing themselves for the future [10]. Successful implementation of the TVET Collaboration Hub is crucial in achieving these goals.

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