

The Present and Future of Malaysian Technical and Vocational Education and Training (TVET)

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Abstract

Technical and Vocational Education and Training (TVET) is the key to technical advancement, rapid industrialization, wealth generation, and poverty reduction. TVET is vital for preparing individuals for the workforce and enhancing their employability, particularly in science, technology, engineering, and mathematics (STEM)-related careers. This conceptual paper aims to determine the present and the future of Malaysian technical and vocational education and training (TVET). We review literature on the Malaysian technical and vocational education and training (TVET) throughout Malaysia and show that a clearer understanding and the needs of current and future Malaysian TVET. The Malaysian government has invested heavily in TVET, making it one of the most developed TVET systems in Southeast Asia. However, there are still a major gap between TVET Malaysia and other developed countries. The major challenges TVET in Malaysia are various providers, negative perception of vocational education, curriculum under revise, lack of matching training to available jobs and limited collaboration between TVET institutions and industries. Despite the fact that substantial efforts have been made to strengthen TVET in Malaysia, there is still more work to be done to address the challenges facing the sector.

Keywords: Technical and Vocational Education and Training (TVET), Sustainable Development Goal (SDG), Malaysia, Education System, Workforce

Introduction

Education is an essential human right and a crucial investment for a country to attain other sustainable development outcomes. It implies that by facilitating access to a high-quality education, children, adolescents, and adults will be able to acquire the skills and knowledge they need to survive in life. Based on the needs of industrial development, the skills and effectiveness of a country's workforce depend on the quality of its education and training (Stephen, 2020). Technical and Vocational Education and Training (TVET) is therefore the key to technical advancement, rapid industrialization, wealth generation, and poverty reduction.

TVET, also known as skill-oriented education, became the focus of both developed and developing countries in order to meet the rising demand for a highly competent workforce with sophisticated skills (Harun & Munzir, 2020). TVET in human resource development has also been identified as one of the factors of growing industries and employment possibilities in the global skills race, elevating TVET to a new level in the global context (Salleh & Sulaiman, 2020). In most nations, the TVET system is a vital component of the economic landscape. A highly qualified and trained workforce is urgently required to adapt to shifting global conditions in light of the fact that all current technological developments are geared towards replacing jobs and modifying skill requirements (Holden, 2009). TVET has been adopted and positioned as a solution for solving present and future labour market needs (Chukwu et al., 2020). The United Nations Educational, Scientific, and Cultural Organization (UNESCO) defines TVET as “a process that involving aspects of education, in addition to general education, technology, and science studies, that relate to the acquisition of practical skills, attitudes, understanding, and knowledge related to work in various sectors of the economy (UNESCO, 2016). TVET programs emphasise the development of job-specific skills and capabilities rather than general academic knowledge. TVET is vital for preparing individuals for the workforce and enhancing their employability, particularly in science, technology, engineering, and mathematics (STEM)-related careers. TVET programs may include apprenticeships, vocational courses, and other types of hands-on training (UNESCO, 2017). Each country in the world implements a unique way of TVET, which attempts to establish its own state mechanism and allocate resources to certain channels in order to satisfy its economic and social conditions (Winch, 2013).

As a tool for sustainable development, TVET was designed to help fight poverty, slow economic growth and low productivity, social inequality, instability and insecurity, the threat of environmental decay, and a lack of understanding about green practices (UNESCO, 2019). The goal of TVET as a system of education focused on the workplace and specific occupations are to increase students' employability, flexibility, mobility, and productivity (Bakar, 2011). Through TVET, countries have generated highly skilled people, resulting in a high level of human capital development, hence fostering industrialisation and economic prosperity (Bakar, 2011). According to Zain et al (2017), Malaysia should enhance recruitment at TVET and improve the overall quality of training in order to fulfil its objective to transform its economy into a high-income economy. If these reforms are not implemented quickly, the country is believed to be globally incompetent and to continue falling behind. TVET is not only capable of producing talented and trained employees but is also capable of creating its own jobs using the talents it possesses. Each program is specifically intended to fulfil the needs of a certain profession. In addition to gaining confidence and the ability to adjust while joining the workforce, students will be exposed to a real work environment throughout their final semester.

History of TVET

The first suggestion from The United Nations Educational, Scientific and Cultural Organization (UNESCO) uses a broader definition of TVET and puts more emphasis on learning for life and sustainable development. This is in accordance with Sustainable Development Goal 4 (SDG4), to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". This advice is relevant and significant given that TVET is key to SDG4-Education 2030 and can build capacities across SDGs. It establishes general principles, objectives, and recommendations that each Member State should implement based on its

context, governing bodies, and available resources. In 1946, UNESCO was established as the 'United Nations Educational, Scientific, Cultural Organization' with the mission of fostering peace, the eradication of poverty, sustainable development, and intercultural cooperation. In 1989, UNESCO established the mandate that "the development of technical and vocational education should contribute to the preservation of peace and goodwill among nations."

In 1992, the International Centre for Technical Vocational Education and Training (UNEVOC) Network and the International Project on Technical and Vocational Education were established. In 1999, the term TVET was first introduced in UNESCO Second International Congress on Technical and Vocational Education in Seoul. Besides, establishment of The International Centre for TVET in Bonn, Germany to help UNESCO member nations improve their TVET systems so that they have "high quality, relevant, and effective programmes and learning experiences."

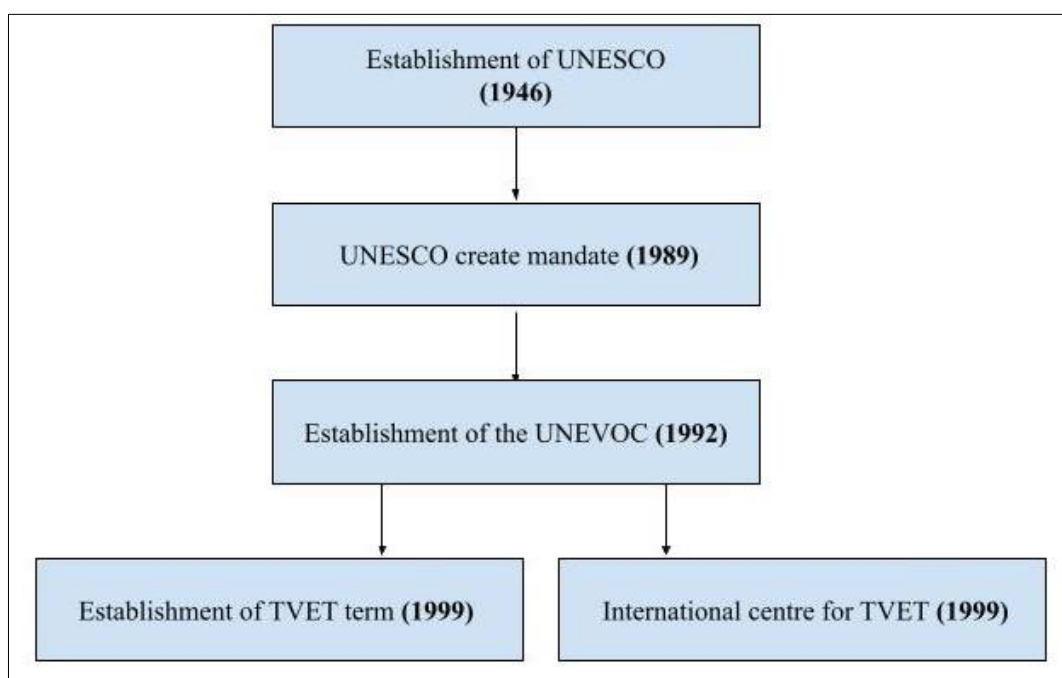


Figure 1: History of TVET establishment

TVET in Malaysia

Beginning in the 1950s, Technical and Vocational Education and Training (TVET) in Malaysia went through several stages of development (Hoftijzer et al., 2020). The government acknowledged the importance of providing technical and vocational education to satisfy the needs of the expanding industrial sector. The first technical school was founded in 1955, while the first vocational school was formed in 1964 (Doner et al., 2021; Tilak, 2003). These schools offered instruction in disciplines like engineering, mechanics, electronics, and agriculture. Malaysia has prioritised the growth of TVET since the 1970s, when vocational schools were established (Hassan et al., 2019). The Malaysian government has emphasised the significance of TVET as a program with industry requirements and to implement competency-based training (ASEAN Secretariat, 2020). In recent years, the government of Malaysia implemented a number of efforts to further enhance the quality and relevance of TVET. These include the National TVET Blueprint 2018-2025, which intends to match TVET qualifications with industry requirements and provide graduates with pathways to work or further education (Kamarudin,

2022). According to Malaysian Investment Development Authority (MIDA, 2022), in the Dewan Rakyat, the government unveiled Budget 2023, earmarking RM6.7 billion for seven key ministries to execute a range of initiatives focused on Technical and Vocational Education and Training (TVET). Today, TVET is a vital component of the education system in Malaysia, with a variety of programmes and institutions available to students. The government continues to invest in TVET to ensure that it meets the needs of the economy and provides students with opportunities to acquire the skills necessary for successful careers. Overall, the development of TVET in Malaysia has been a government priority, with an emphasis on ensuring that TVET programs are relevant, high quality, while offering graduates with the skills and knowledge required for success in the workforce. TVET continues to be acknowledged as one out of the 14 change drivers within the 12th Malaysian Master Plan. The 12th Malaysian Master Plan is focusing on reformation and transformation (Chitsa et al., 2022). In regards to TVET, the 12th Malaysian Master Plan intends to enhance the TVET ecosystem in order to facilitate the availability of skilled labourers for the implementation of Industry 4.0. With enhanced acknowledgment of TVET through accreditation, recognition, and certification enhancements, the rating system of TVET institutions will improve numerous aspects, including employability, graduate pay rates, industry cooperation, and the execution of social initiatives (Chitsa et al., 2022).

Issues TVET in Malaysia

When it comes to technical and vocational education and training (TVET), there are still a great deal of problems that need to be solved for the Malaysian Education Development Plan 2013-2025 can be accomplished. According to a report by the Federation of Malaysian Manufacturers (FMM) on September 6, the manufacturing sector, especially in semiconductors and electronics, is grappling with a severe shortage of highly skilled professionals, including engineers and technicians. This shortage is believed to have resulted in an estimated loss of RM50 billion in national income over the past eight months (FMM, 2022). According to the Malaysian Department of Statistics, in the second quarter of 2022, the labor market was predominantly composed of jobs in the semi-skilled category, accounting for 62.2% (5.364 million). This was followed by highly skilled positions at 24.9% (2.144 million) and unskilled jobs at 12.9% (1.111 million) (Department of Statistics, 2022).

The absence of efficient coordination, resource sharing, and articulation within the whole system is one of the major difficulties facing TVET in Malaysia. There is also no centralised authority that can survey the entire TVET scene. As mentioned by the National TVET Movement (PPTN) chairman, Mohamad Yaacob, the issue that is plaguing the TVET sector can be addressed if the management is placed under one ministry as is practised in several developed nations such as Germany, Switzerland, Austria and Finland. According to Mohamad Yaacob, if TVET management is placed under one ministry, the TVET ecosystem will be organised, and as such, avoiding duplication of courses and resource wastage (National TVET Movement (PPTN) chairman told (New Straits Times, 2023).

The duplication and fragmentation of training, as well as the lack of a single framework for developing coherent policies and joint initiatives, can be traced back in part to the systemic inefficiencies introduced by the TVET's disjointed organizational structure and the distribution of supervisory responsibilities amongst different government entities and ministries (Cheok & Chen, 2022). The funding for Malaysia's TVET is divided among several ministries or departments that are in charge of TVET. Figure 2 depicted various ministries and stakeholders

engaged in Technical and Vocational Education and Training (TVET), including Ministry of Education, Ministry of Higher Education, Ministry of Human Resources, Ministry of Regional and Rural Development, Ministry of Youth and Sports, Ministry of Agriculture and Food Industries, Ministry of Works, Federation of Malaysia Skills Development Centre.

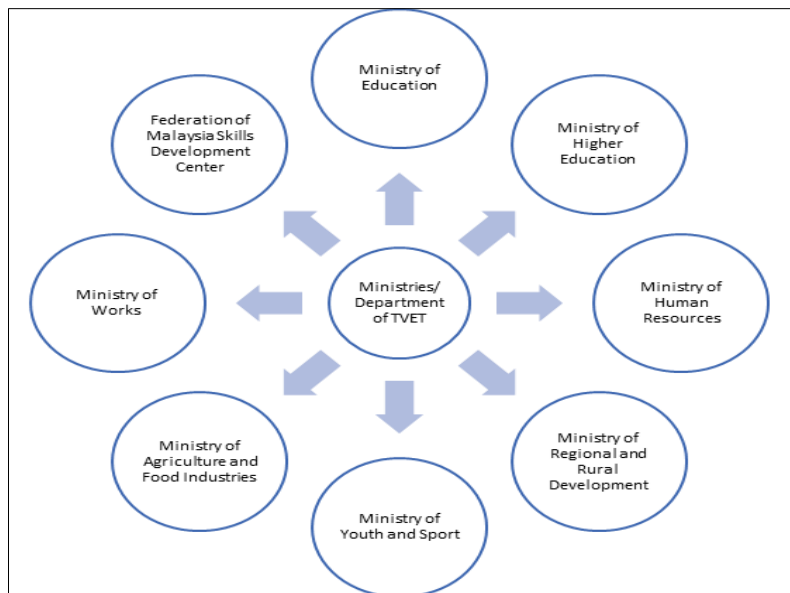


Figure 2: Malaysian Ministries/ Department of TVET

Qualifications	Ministry of Human Resources	Ministry of Youth and Sports of Malaysia	Ministry of Rural and Regional Development	Ministry of Defence Malaysia	Ministry of Higher Education	Ministry of Agriculture	Ministry of Work	State
Degree in Engineering Technology (Level 6)			Universiti KL (Unikl)	National Defence University of Malaysia (UPNM)	Malaysian Technical Universities Networks (MTUN) Private Universities/ Universities Colleges			
Advanced Diploma/ Diploma in Technology (Level 4 and 5)	CIAST Japan Malaysia Technology Institute (JMTI)		German Malaysia Institute (GMI) Japan Malaysia Technical Institute (JMTi)					
Advanced Skills Diploma/ Advanced Diploma in Technology (Level 5)	Advance Training Institute Centre (ADTEC)	National Youth Advance Skills Institute (IKTBN)			Polytechnics			
Skills Diploma/ Diploma in Technology (Level 4)	Federation of Private Accredited Centre (FEMAC) Industrial Training Institute (ILP)	National Youth Skills Institute (IKBN)	MARA Advanced Skills College (KKTm) Poly-Tech College & MARA Professional College	PERHEBAT Institute	Vocational College			Federation of Malaysian Skills Centre (FMSDC)
Skills Certificate (Level 1-3)/ Certificate of Technology (Level 3)		National Youth Skills Institute (IKBN)	MARA Skills Institute (IKM) Giat MARA		Community College	National Agriculture Training Council Institute	CIDB (Malaysia Architecture Academy)	Negeri Sembilan Skills Development Centre (NSSDC) Penang Skills Development Centre (PSDC)

Figure 3: TVET Institutions under several ministries

According to UNESCO-UNEVOC (2023), the provision of TVET in Malaysia is carried out by various governmental and commercial agencies, ministries, and organisations. The Ministry of Human Resources is responsible for overseeing various skill training institutions, including Industrial Training Institutes (ILPs), Advanced Technology Training Centre (ADTECs), Centre

for Instructor and Advanced Skill Training (CIAST), and administering non-formal TVET programs. This ministry operates these institutes, providing training programs at basic, intermediate, and advanced levels. Additionally, it supervises the National Vocational Training Council (NVTC), which is tasked with maintaining quality standards, accrediting training providers, and certifying courses. The Ministry of Youth and Sports is involved in delivering industrial skills training programs at different skill levels, primarily at training centres such as the Youth Skills Training Centre and Advanced Youth Advanced Skills Training Centre. The Ministry of Rural and Regional Development offers TVET programs through various institutions, including Institute Kemahiran MARA (IKM), Kolej Kemahiran Tinggi MARA (KKTM), MARA Japan Industrial Institute (MJII), GIATMARA, and the German-Malaysian Institute (GMI). These programs encompass certificates and diploma-level courses. The Ministry of Defence which in charge the National Defence University of Malaysia and Department of Veterans Affairs. The Ministry of Defence holds oversight over two key entities: The National Defence University of Malaysia (UPNM) and the Department of Veterans Affairs. UPNM represents Malaysia's inaugural military institution, catering to the specific requirements of the Malaysian Armed Forces. On the other hand, the Department of Veterans Affairs is tasked with providing vocational training to military veterans. The department is responsible for supervising the execution of pre-resettlement, resettlement, and post-resettlement courses and training offered by PERHEBAT. The Ministry of Higher Education is responsible for the supervision of TVET programs within public and private universities, polytechnics, and community colleges. The Ministry of Agriculture plays a vital role in supplying the agricultural sector with a fresh pool of skilled labor through the Program Latihan Kemahiran Pertanian Kebangsaan (PLKPK), which is administered by the National Agricultural Training Council (NATC). Additionally, it provides Agricultural Certificate Programs through the Malaysia Agriculture Institutes. The Ministry of Works provides TVET training through its affiliated agencies, including the Construction Industry Development Board (CIDB) and the Akademi Binaan Malaysia (ABM) (UNESCO-UNEVOC, 2023).

Many TVET providers work in collaboration, without considering the bigger picture of their curriculum offers, leading to duplication of effort and clarity for both students and businesses (Ismail & Abiddin, 2014; Yeap et al., 2021). This circumstance has repercussions for the standardisation of training and qualifications, as well as for value for money, ensuring quality, acknowledgment of prior learning, and the continuation of education for graduates of TVET programs (Vinayan et al., 2020). It was also previously mentioned that the approach of TVET in Malaysia is rooted in three different models (Ismail et al., 2018). These models are a liberal model, according to which industries set the skills and knowledge, a bureaucratic model, in which the power lies with the government, and a dual system, which emphasises collaboration between institutions and industries. Despite having the National TVET Council established in 2021 to realise the strategies and initiatives of 12th Malaysian Plan, there is still lacks effective coordination, sharing of resources, and articulation within the overall system.

The general public's unfavourable view of vocational education presents yet another obstacle for TVET in Malaysia. When compared to more traditional educational options, many people continue to have the mindset that TVET is an inferior kind of education. The way that people in Malaysia think about TVET is directly related to how well it is branded. When compared to the more theoretical or 'academic' education offered by most institutions, TVET, as is the case in a number of nations, receives a lesser or unfavourable impression. The government has

made numerous attempts throughout the years to make TVET the default option for young people. Nonetheless, the myth persists that TVET degrees result in inferior social status, income, and work satisfaction (Penang Institute, 2023).

The value of TVET has always been compared to traditional academic education. The general public, and parents in particular, have the impression that TVET programs are at an impasse and fail to provide graduates enough career opportunities to advance. To bring about a shift in mentality, it is necessary for the TVET system and policy makers to engage in a very important role. The TVET sector is often perceived as primarily serving students who have discontinued their formal education, rather than being recognized as a crucial avenue for preparing skilled professionals. Certifications and career opportunities stemming from TVET programs continue to suffer from a lack of understanding and acknowledgement within the job market (Yusoff et al., 2022). Because of the highly dispersed landscape and the fact that many different ministries and organisations issue certifications, a significant number of employers do not recognise the credentials. It is backed by Harun and Munzir (2020), in which they indicated that an excessive amount of attention and resources are given to "academic" education rather than practical education. The same can be said for accolades and job opportunities.

The syllabus for TVET needs to be regularly updated in order to adapt to the shifting requirements of various businesses. On the other hand, due to the mechanisms involved in bureaucracy, upgrading the curriculum can be a slow and laborious process. The vocational and technical education and training (TVET) programmes that are now being offered in Malaysia are primarily driven by supply, and there is still a dearth of job placement assistance (Ibrahim & Nashir, 2022). As a result, educational institutions have failed to utilise the feedback provided by previous trainees regarding the calibre of their training programs, there by missing out on opportunities to enhance their curricula and training offerings. In summary, there is a deficiency in the execution of outcome evaluation and tracer studies, which have the potential to enhance the market adaptability of educational programs. According to Yaakob's (2020) observations, a mismatch between demand and supply exists within the industry, which is a contributing factor to the presence of unoccupied employment vacancies. It is evident that enhancing the connections between educational institutions and the corporate sector is imperative in order to mitigate this incongruity. The reaction of the private sector towards industrial training has been tepid, as private vocational training institutions are encountering difficulties in securing financial backing and student enrollment.

In Malaysia, the scarcity of career prospects for TVET graduates persists, despite the growing need for proficient labour (Yong, 2019). The present circumstance can be attributed in part to the unfavourable perception of vocational education as previously stated, as well as the restricted cooperation between TVET establishments and industries in Malaysia. The difficulties associated with Technical and Vocational Education and Training (TVET) as perceived by the industry are not straightforward to ascertain (Yeap et al., 2021; Ramamurthy et al., 2021). Insufficient collaboration has a negative impact on the calibre of education imparted, potentially resulting in graduates lacking the requisite competencies for gainful employment. Comprehending the perspective of the industry towards Technical and Vocational Education and Training (TVET) in Malaysia can aid skill institutions in equipping their students with the necessary competencies to meet the requirements of industrial placements (Yeap et al., 2021; Rodzalan et al., 2022). Having knowledge and understanding

of potential challenges or difficulties that may arise in the industry can enhance students' readiness for future employment opportunities (Bassah, 2022).

Recommendation and Conclusion

Technical and Vocational Education and Training (TVET) is an important aspect of Malaysia's education system, as it provides students with the necessary skills and knowledge to succeed in the workforce. At the same time, TVET is also a key part of closing the skills gap, lowering unemployment, increasing productivity, and boosting economic growth. TVET can help reduce unemployment by providing individuals with relevant skills that enable them to access job opportunities in various sectors. Moreover, TVET can improve productivity as it equips individuals with practical skills that enable them to carry out tasks more efficiently and effectively. Malaysia has a significant opportunity to harness Technical and Vocational Education and Training (TVET) as a means to cultivate a proficient workforce that plays a pivotal role in promoting sustainable development. This can be achieved by giving precedence to areas such as renewable energy, environmental preservation, and sustainable agriculture. Incorporating Research and Development (R&D) into the realm of TVET can serve as a catalyst for the uptake of eco-friendly technologies, the propagation of sustainable methodologies, and the advancement of socially innovative initiatives. These efforts collectively pave the way for a more sustainable and robust economy, poised to benefit future generations.

Malaysia acknowledges TVET is an important factor in the development of human capital in the country. Therefore, TVET is always positioned as one of the drivers of changes within its national development plans in the 12th MP. The major challenges TVET in Malaysia are acknowledge as follows: 1) Various TVET providers: inefficiencies in the system like duplication and segmentation of training; 2) Negative perception of vocational education: consider TVET as a second-class education system compared to traditional academic programs; 3) Curriculum under revise: lack of matching training to available jobs; 4) Limited collaboration between TVET institutions and industries: graduates may not possess the necessary skills needed in the job market.

In order to thrive in the coming era, individuals and organizations must proactively enhance their technical expertise to effectively navigate and actively participate in the ongoing wave of technological advancement. This transformation is characterized by the pervasive integration of digitalization, sophisticated instrumentation, and comprehensive automation across various domains, and it is poised to be the defining force shaping our future. The rapidly evolving landscape of technology is reshaping industries and sectors worldwide. Digitalization, which involves the conversion of analog processes into digital formats, is becoming the cornerstone of modern operations. From data management to communication, businesses and individuals must embrace digitalization to remain competitive and efficient.

A potential challenge arises from the fact that training institutions and industries may employ different technologies, leading to a potential skills gap among graduates. Keeping pace with the rapid advancements in technology is a formidable task, and it is unrealistic to expect educational institutions to produce graduates who possess 100% of the precise industrial skills demanded by contemporary workplaces. However, a pragmatic solution to address this issue is to focus on training a workforce that possesses approximately 70% of the skills required for the industry. While this approach may not equip individuals with a complete mastery of every intricate aspect of their field, it can still be highly effective. The key lies in

aligning this 70% skill set with the industry's expectations and needs. In essence, this strategy acknowledges that, given the ever-evolving nature of technology, perfection may be unattainable. Instead, it places emphasis on creating a competent workforce that can adapt to new technologies and learn on the job. Moreover, it highlights the importance of industry recognition and acceptance of these skills. If employers acknowledge and value this 70% skill level, it can serve as a practical benchmark for setting salary standards.

To ensure that TVET graduates are employable, the Malaysian government has implemented a number of initiatives. These include providing financial incentives to companies that hire TVET graduates, establishing industrial training funds to support on-the-job training, and offering certification programs to recognize the skills of TVET graduates. The establishment of the National TVET Council is a commendable initiative. However, it would be beneficial to establish cross-ministerial, government, and private collaboration under a specialised organisation, such as the TVET Department or the TVET Ministry. This approach would enable parallel implementation and continuous monitoring of the applied curriculum, ultimately leading to the achievement of the goals set in 12th Malaysian Plan. The attainment of the objective to consolidate the Skills Certification System into a singular TVET Certificate can solely be realised through this avenue. Acknowledging the significance of Technical and Vocational Education and Training (TVET), it is imperative to conduct a comprehensive campaign, promotion, and rebranding to eradicate the notion that TVET is a substandard form of education and has lost its relevance.

The statement aligns with the governmental endeavours articulated by the former Prime Minister of Malaysia, Datuk Seri Ismail Sabri Yaakob, emphasising the importance of acknowledging the strategies and initiatives formulated under the 12th Malaysia Plan. (RMK-12). Despite the fact that substantial efforts have been made to strengthen TVET in Malaysia, there is still more work to be done to address the challenges facing the sector. However, with continued commitment and collaboration between the government, industry, and TVET institutions, there is potential for TVET to play a key role in Malaysia's economic development. Additional research is required to implement a strategy for the rebranding of Technical and Vocational Education and Training (TVET) in Malaysia. Therefore, TVET Malaysia needs to be revamped so that it can sit under one umbrella and be implemented in a more conducive and effective manner. In light of this, by upgrading the image of TVET in Malaysia, Malaysians will change their perspectives and have a greater faith towards technical and vocational education to fit the criteria in achieving SDG.

References

- Bakar, A. R. (2011). *Preparing Malaysian youths for the world of work: Roles of technical and vocational education and training (TVET)*. Penerbit Universiti Putra Malaysia.
- Cheok, C. K., & Chen, Y. C. (2022). *Future of labour. In Malaysia's leap into the future: The building blocks towards balanced development*. Springer Singapore.
- Chitsa, M., Sivapalan, S., Singh, B. S. M., & Lee, K. E. (2022). Citizen Participation and climate change within an urban community context: Insights for policy development for bottom-up climate action engagement. *Sustainability, 14*(6), 3701.
- Chukwu, D. U., Anaele, E. A., Omeje, H. O., & Ohanu, I. B. (2020). Assessing technical vocational education and training (TVET) labour market potentials: Comparison of conferees' opinions. *Journal of Technical Education and Training, 12*(2), 12-23.

- Department of Statistics Malaysia. (2022). *Employment Statistics Second Quarter 2022 Putrajaya-Malaysia*, [https://www.dosm.gov.my/portal-main/release-content/employment-statistics-second-quarter-2022#:~:text=During%20this%20quarter%2C%20the%20number,per%20cent%20\(49.3%20thousand\)](https://www.dosm.gov.my/portal-main/release-content/employment-statistics-second-quarter-2022#:~:text=During%20this%20quarter%2C%20the%20number,per%20cent%20(49.3%20thousand))
- Doner, R. F., Noble, G. W., & Ravenhill, J. (2021). *The political economy of automotive industrialization in East Asia*. Oxford University Press.
- Federation of Malaysian Manufacturers (FMM). (2021). *Shortage of workers will derail economic recovery, we need fast action from Government to prevent the fall out of industries*. https://www.fmm.org.my/sub_page.aspx?id=3942bc47-be96-4df0-8e4b-4f41f0108055&pid=bca67f9e-3687-4a00-847f-e17a5e1e70da&print=1
- Harun, A., & Munzir, A. (2020). TVET in Malaysia: Capabilities and challenges as viable pathway and educational attainment. *Journal on Technical and Vocational Education*, 5(1).
- Hassan, S., Shamsudin, M. F., & Mustapha, I. (2019). The effect of service quality and corporate image on student satisfaction and loyalty in TVET higher learning institutes (HLIs). *Journal of Technical Education and Training*, 11(4).
- Hoftijzer, M., Levin, V., Santos, I., & Weber, M. (2020). *TVET (Technical and Vocational Education and Training) in the times of COVID-19: Challenges and Opportunities*. <https://blogs.worldbank.org/education/tvet-technical-and-vocational-education-and-training-times-covid-19-challenges-and>.
- Holden, R. (2009). Quality improvement in adult vocational education and training: Transforming Skills for the global economy. *Education Training*, 51(1), 85-86.
- Ibrahim, A., & Nashir, I. M. (2022). Demand-supply Mismatch in TVET academic programmes: what is it and what should it be? *Journal of Technical Education and Training*, 14(2), 177-189.
- Ismail, A., & Abiddin, N. Z. (2014). Issues and challenges of technical and vocational education and training in Malaysia towards human capital development. *Middle-East Journal of Scientific Research*, 19(2), 7-11.
- Ismail, A., Adnan, W. N., Masek, A., Hassan, R., Hashim, S., & Ismail, M. E. (2019). Effectiveness of entrepreneurship programmes in developing entrepreneurship skills towards quality TVET graduates. *Journal of Technical Education and Training*, 11(1).
- Ismail, A., Adnan, W. N., Masek, A., Hassan, R., Hashim, S., & Ismail, M. E. (2019). Effectiveness of entrepreneurship programmes in developing entrepreneurship skills towards quality TVET graduates. *Journal of Technical Education and Training*, 11(1).
- Kamarudin, N. (2022). Enhancing quality TVET graduates through three integrated curriculum models—the DPCCE experience. *International Journal of Technical Vocational and Engineering Technology (iJTveT)*, 3(1), 1-14.
- Malaysian Investment Development Authority. (2022). *TVET as a catalyst for economic growth*. <https://www.mida.gov.my/mida-news/tvet-as-a-catalyst-for-economic-growth/>
- Yusoff, M. R., Harun, A., & Munzir, A. (2020). TVET in Malaysia: Capabilities and challenges as viable pathway and educational attainment. *Journal on Technical and Vocational Education*, 5(1).
- New Straits Times (2023). *Experts: TVET under a single ministry to improve ecosystem* <https://www.nst.com.my/news/nation/2023/08/938643/experts-tvet-under-single-ministry-improve-ecosystem>

- Penang Institute (2023). *TVET in Malaysia: Current Situation, Challenges and Recommendations*. <https://penanginstitute.org/publications/issues/tvet-in-malaysia-current-situation-challenges-and-recommendations/>
- Ramamurthy, V., Alias, N., & DeWitt, D. (2021). The need for technical communication for 21st century learning in TVET institutions: Perceptions of industry experts. *Journal of Technical Education and Training*, 13(1), 148-158.
- Rodzalan, S. A., Noor, N. N. M., Abdullah, N. H., & Saat, M. M. (2022). TVET skills gap analysis in electrical and electronic industry: perspectives from academicians and industry players. *Journal of Technical Education and Training*, 14(1), 158-177.
- Salleh, K. M., & Sulaiman, N. L. (2020). Reforming technical and vocational education and training (TVET) on workplace learning and skills development. *International Journal of Recent Technology and Engineering*, 8(5), 2964-2967.
- Stephen, O. O. (2020). *Information technology, technical vocational education in developing workforce towards globalization. In the roles of technology and globalization in educational transformation* IGI Global.
- The ASEAN Secretariat. (2020). *Terms of reference of the ASEAN TVET Council*. <https://asean.org/terms-of-reference-of-the-asean-tvet-council/>.
- Tilak, J. B. (2003). *Vocational education and training in Asia*. International handbook of educational research in the Asia-Pacific Region. UNESCO (2016, May 23). *Strategy for TVET 2016–2021 - UNEVOC Publications*. <https://unevoc.unesco.org/home/UNEVOC+Publications/lang=en/akt=detail/qs=5986#:~:text=The%20Strategy%20has%20three%20priority,green%20economies%20and%20sustainable%20societies.>
- UNESCO. (2017). *UNEVOC: Bulletin Issues: ICT in TVET*. <https://unesdoc.unesco.org/ark:/48223/pf0000373197>
- UNESCO (2019). *Assessment of the labour market & skills analysis: Iraq and Kurdistan Region-Iraq*. Baghdad: UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000371374>
- UNESCO-UNEVOC (2023). *Key Statistics TVET Country Profiles Malaysia*. <https://unevoc.unesco.org/home/Dynamic+TVET+Country+Profiles/country=MYS>
- Vinayan, G., Harikirishanan, D., & Ling, S. M. (2020). Upskilling and reskilling the workforce via industry driven technical and vocational education and training: Strategies to initiate Industry/Institution partnership in Malaysia. *Journal of Economic Info*, 7(2), 94-103.
- Winch, C. (2013). The attractiveness of TVET. *Revisiting global trends in TVET: Reflections on theory and practice*, 86-122.
- Yaakob, M. F. M., Awang, H., Ismail, M. Z., Zain, F. M., Kasim, M., & Adnan, A. A. Z. (2020). Backward and forward reviews on technical and vocational education and training (TVET) in Malaysia: The evolution and ICT-driven future prospect. *Universal Journal of Educational Research*, 8(6), 2197-2203.
- Yeap, C. F., Suhaimi, N., & Nasir, M. K. M. (2021). Issues, challenges, and suggestions for empowering technical vocational education and training education during the COVID-19 Pandemic in Malaysia. *Creative Education*, 12(8), 1818-1839.
- Yong, H. N. A. (2019). Preparing for youth employment in Malaysia: The influence of education and training policy. *International Economic Policy*, 2(30), 7-26.
- Zain, N. M., Aspah, V., Abdullah, N., & Ebrahimi, M. (2017). Challenges and evolution of higher education in Malaysia. *UMRAN-International Journal of Islamic and Civilizational Studies*, 4(1-1)