

Way Forward – Future Skills Framework, Strategies and Action Plan for Malaysian Talent Development

Mohd Zulkifli Mohd Yunus, Mohaizi Mohamad, Azimuddin Bahari and Nurul Faiezah Ngadimin

Abstract – This paper discusses the future of talent development in Malaysia, with a focus on Technical and Vocational Education and Training (TVET). In a rapidly changing job market and advancing technology, it's crucial to equip the Malaysian workforce with the right skills. TVET plays a significant role in preparing individuals for future jobs, closing the skills gap, and improving employability. When integrated effectively, TVET programs provide practical, industry-relevant skills for workers to adapt and succeed. This paper explores how TVET aligns with broader talent development strategies to support sustainable economic growth and individual prosperity. Existing research often focuses on isolated aspects of TVET, lacking a comprehensive approach. This study aims to create a framework that integrates TVET into a broader talent development strategy, addressing the diverse needs of the Malaysian workforce. It offers initiatives to promote lifelong learning, digital literacy, adaptability, and critical STEM and soft skills. It also explores strategies to encourage entrepreneurial thinking, bridge the gap between education and industry, and promote apprenticeships and on-the-job training. The findings underscore the pivotal role of TVET in Malaysian talent development. A well-integrated TVET system, supported by a comprehensive framework, can boost economic growth, reduce unemployment, and foster an adaptive, innovative, and competitive workforce. This paper identifies strategies for policy reform, public-private partnerships, investments, and data-driven decision-making. The proposed action plan outlines a roadmap to effectively implement these strategies, ensuring that Malaysia's workforce is ready for future challenges and opportunities.

Keywords – Future skills framework; talent development, TVET strategies and transformation.

I. INTRODUCTION

In the contemporary, rapidly evolving global landscape, the imperative of skill development stands as a pivotal force propelling economies forward and ensuring their competitive edge. The swift evolution of industries, driven by technological advancements, intensifies the demand for a highly skilled workforce. However, Malaysia encounters formidable challenges in nurturing talent, such as a persistent gap between educational outcomes and industry needs, inadequate industry involvement in educational frameworks, and a pervasive lack of awareness surrounding vocational and technical education. These obstacles significantly impede the nation's ability to meet the multifaceted demands of a modern economy.

Mohd Zulkifli Mohd Yunus, Universiti Geomatika Malaysia
(dr.mohdzulkifli@geomatika.edu.my)
Mohaizi Mohamad, Universiti Geomatika Malaysia
(mohaizi@geomatika.edu.my)
Azimuddin Bahari, Universiti Geomatika Malaysia
(datoazimuddin@geomatika.edu.my)
Nurul Faiezah Ngadimin, Universiti Geomatika Malaysia
(faiezah@geomatika.edu.my)

Technical and Vocational Education and Training (TVET) emerges as a paramount catalyst, adept at bridging skill disparities and meeting industry demands through specialized training across various sectors (Ainull et al., 2022). By equipping individuals with practical skills and enhancing their employability, TVET not only addresses the scarcity of skilled labor but also sparks innovation, fosters entrepreneurship, and boosts productivity. Its impact spans economic growth and social development, alleviating unemployment rates, elevating living standards, and steering progress toward inclusivity.

According to Shuhada (2023), Malaysia plans to prepare its human resources for the Fourth Industrial Revolution (IR 4.0) in order to reduce the current consumption gap in a number of key industries, including those that are driving the country's economic transformation. The government has acknowledged the importance of the TVET sector in developing skilled workers and generating revenue to support Malaysia in reaching its goal of becoming a high-income nation. Because of its potential to raise the employment rate, TVET will be essential in luring highly skilled workers.

In response to the rapidly evolving global economy, significantly influenced by advancing technology, Malaysia must expeditiously enhance its TVET capacity. This necessitates a dual focus on augmenting both the quantity and quality of TVET graduates. This proactive approach is imperative for Malaysia to sustain competitiveness on the world stage and effectively position itself for the future. By fortifying its TVET capabilities, Malaysia can secure a robust pipeline of skilled professionals, ensuring its workforce is well-equipped to meet the challenges and opportunities presented by ongoing technological advancements. This strategic investment in TVET aligns with the broader goal of fostering the development of future Malaysian talent.

II. PROBLEM STATEMENT

The multi-layered challenges obstructing the establishment of TVET as a catalyst for talent development in Malaysia remain a persistent hurdle. Noorazman et al. (2017) emphasized these challenges, revealing a landscape riddled with complexities hindering the attainment of objectives outlined in the Malaysian Education Development Plan 2013-2025. These impediments range widely, from societal biases against TVET to governance inadequacies, deficiencies in the TVET framework, educator competency gaps, skill mismatches in the job market, absence of industry-aligned curricula, limited financial resources, and unequal salaries for TVET graduates (Ramlee, 2017).

These obstacles not only obstruct TVET's growth and efficacy but also undermine the holistic development of Malaysian talent. Addressing this multifaceted array of

hurdles becomes an urgent mandate to reshape societal perceptions of TVET and enhance its effectiveness as a pivotal avenue for talent development. Thus, this paper aims to devise comprehensive strategies for policy reform, underscore the critical role of public-private partnerships, and outline an actionable plan to implement these strategies effectively. Implementing these proposed recommendations holds the key to overcoming these barriers, ensuring TVET aligns seamlessly with industry demands and nurtures a highly skilled workforce capable of navigating future challenges and seizing opportunities for comprehensive talent advancement in Malaysia.

The ongoing discussion on talent development in Malaysia lacks a holistic framework that fully integrates TVET programs. Despite its potential to address skill gaps and improve employability, TVET's impact remains limited due to fragmented approaches. This fragmented outlook impedes the optimization of TVET's contributions to sustainable economic growth and individual prosperity. Additionally, the absence of a comprehensive framework restricts the alignment of TVET with broader talent development strategies needed to navigate the evolving job landscape and foster a competitive workforce.

This study endeavors to bridge this gap by formulating a comprehensive framework that seamlessly integrates TVET into Malaysia's talent development strategies. It seeks to cater to the diverse needs of the Malaysian workforce by promoting lifelong learning, digital literacy, adaptability, critical STEM, and soft skills. Moreover, it aims to explore strategies to stimulate entrepreneurial thinking, establish robust education-industry links, and advocate for apprenticeships and on-the-job training. The lack of such an integrated approach undermines the pivotal role TVET could play in enhancing economic growth, reducing unemployment, and cultivating an innovative and adaptable workforce in Malaysia.

These framework and strategies will form the basis of an actionable plan, delineating a roadmap for the effective integration and implementation of TVET. Ultimately, this roadmap aims to prepare Malaysia's workforce to confidently confront future challenges and capitalize on emerging opportunities in an ever-evolving job landscape.

III. LITERATURE REVIEW

Future Talent

Shuhada (2023) highlights that "Framing Higher Education 4.0: Future-Proof Talent" serves as a comprehensive guide for both public and private education sectors in aligning with the demands of IR 4.0. With the advent of IR 4.0 technologies like artificial intelligence, the Internet of Things, digitalization, and automation, Malaysia is compelled to revamp its Higher Education system. This transformation aims to equip students with the requisite skills for emerging job markets (Shuhada, 2023).

In this evolving landscape, education and businesses must recalibrate strategies to enhance, retrain, and scale up talent, harmonizing humanistic values with the integration of smart machines. Hajar Halili (2019) emphasizes the necessity of preparing the next generation to adeptly

navigate technological advancements without losing sight of humanity's essence. "Future Proof Talent" emerges as a strategic initiative, aligning with Malaysia's economic and developmental aspirations, ensuring graduates seamlessly assimilate IR 4.0 skills within a dynamic ecosystem (Shuhada, 2023).

Higher education stakeholders anticipate universities to transcend conventional roles and not only enhance students' learning but also better prepare them for the evolving workforce. The pressure on universities to remain relevant in the face of economic instability and dwindling employment prospects has increased dramatically as attention has shifted to the IR 4.0 (Shuib, 2019).

Addressing this challenge, the Ministry of Education has crafted a framework to equip students for the IR 4.0 era, redirecting the focus of colleges and universities. This framework underscores the need for fostering student creativity and originality through enriched classroom environments. Figure 1 delineates nine critical skill sets that today's Malaysian graduates must cultivate to thrive as tomorrow's professionals.



Figure 1 Nine Sets of Skills of Malaysia Graduates (MOE, 2013)

A comprehensive strategy is imperative to elevate the nation's technical expertise, aligning academic pathways with the dynamic demands of the corporate landscape, thereby cultivating graduates primed for immediate employment. Integral to this pursuit, the 11th Malaysian Plan aspire to enhance human resource development, envisioning a transformation in TVET to cater to 60% of the workforce's requirements (Shuhada, 2023). The success of this initiative hinges upon equipping individuals with TVET-centric skills. Concurrently, the government's blueprint underscores a collaborative synergy with the private sector within the 11th Malaysian Plan. This collaborative effort aims to augment TVET enrolments, elevate program standards, fortify institutional quality, and augment the sector's overall esteem and credibility (Shuhada, 2023). Integrating these measures forms a cohesive framework fostering the development of future-ready talent crucial for the nation's sustainable growth and economic advancement.

The national vision, articulated by former Minister of Education Dr. Maszlee Malik, underscores the imperative transformation of TVET into a primary choice rather than a

secondary option for students (Shuhada, 2023). This necessitates a shift from mere industry participation towards a more collaborative partnership-based approach in TVET, engaging multiple industrial sectors to fortify dual training programs (Aziz, 2019). Research conducted by Ashari and Rasul (2014) emphasizes the pivotal role of collaboration between TVET institutions and industry, highlighting its significance in human resource development and meeting the anticipated labour demands of the future.

Aligning with this vision, the Department of Skills Development (DSD) proactively strive to amplify business engagement within the National Dual Training System (NDTS) (Shuhada, 2023). Efforts to continually integrate cutting-edge workplace innovations into the TVET system are crucial, as they not only enhance student outcomes but also maximize the return on investment in their education (Omar et al., 2020). This concerted approach, as advocated by multiple experts in the field, is pivotal in fostering a robust TVET system aligned with the evolving needs of industries. Such collaborative endeavours will not only elevate the status of TVET but also contribute significantly to the cultivation of future-ready talent essential for Malaysia's sustainable socio-economic growth.

TVET Landscape in Malaysia

Malaysia's pursuit of a high-income economy relies significantly on bridging the gap between industry demands and available skilled manpower. According to a report by the Malaysia Productivity Corporation (MPC) in 2022, there exists a critical shortage of highly qualified human resources across diverse industries, hindering the nation's economic acceleration initiatives.

The Technical and Vocational Education and Training (TVET) sector has emerged as a pivotal solution to this challenge. TVET encompasses a blend of formal, informal, and non-formal learning methodologies aimed at equipping young individuals with the essential knowledge and skills required for employment (UNESCO, 2017). Education and training serve as integral components in realizing the ambitions outlined in the 2030 Agenda (Hamid et al., 2023). Specifically, two of the seventeen Sustainable Development Goals (SDGs) directly align with the education and training offered within the technical and vocational realms, building upon the principles of SDG 4 (which strives to ensure inclusive and equitable education while promoting lifelong learning opportunities for all (Elfert, 2019).

Development of the TVET curriculum in Malaysia has been strongly influenced by economic expansion and industrialisation (Sofea, 2022). As such, to ensure the relevance of its training, the Industry Lead Bodies (ILB) regularly updates the national occupational skills standards (NOSS) to cover emerging skills sector. More recently, a government-industry TVET coordination body (GITC) was formed as a platform for deeper collaboration between government and industry players (Sofea, 2022). Presently, there are more than ten ministries alongside the private sector and state governments administering more than 1,200 TVET providers in Malaysia, in which a majority are public (Muthiah, 2022). Each public TVET provider is under a different ministry, offering its own programmes and training

(Figure 2). For instance, the Ministry of Education (MoE) is responsible for formal TVET programmes in secondary schools while the Ministry of Higher Education (MoHE) oversees higher education programmes. For industrial training and informal programmes, responsibilities fall under several ministries including the Human Resources Ministry and Ministry of Rural Development.

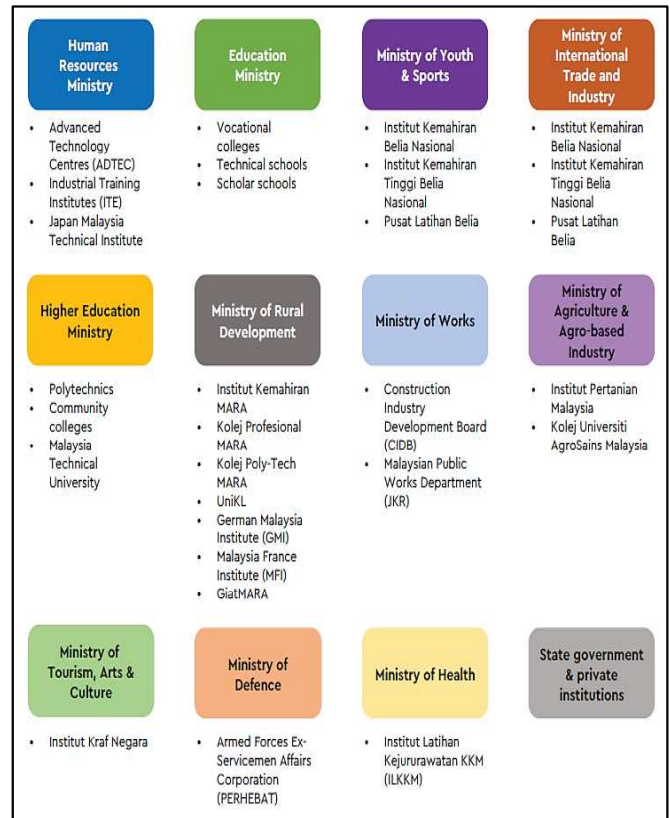


Figure 2 TVET Providers – MyRIVET & UNESCO-UNEVOC (Sofea,

Particularly for young people, TVET provides employment pathways (Wheeler, 2017). TVET emphasis is in line with existing requirements for skilled employees to contribute to a nation's economic success. The framework of TVET can also equip graduates with market-relevant competencies. Figure 3 below shows a Malaysia Qualification Framework (MQF), that provides a set of levels and descriptors covering all sectors, which uses the set of levels and outcomes with the intention to bring progression and pathways together and accommodate all forms of learning. The MQF is a measurement tool designed based on approved and valid criteria at the national level.

The alignment of the TVET sector with the nation's economic goals signifies a concerted effort to address the skill gap and propel Malaysia towards sustainable economic development. It underscores the imperative role of TVET in supplying highly qualified human resources, thereby fostering the country's economic advancement. Through the TVET, thousands of Malaysians have developed essential skills, leading to careers in both the public and private sectors (The Asia Foundation, 2022). The Secretary-General of Malaysia's HR Ministry, Datuk Seri Zaini Ujang, is encouraging employees in Malaysia to reskill and upskill themselves to remain relevant. Additionally, the government

aims to elevate the proportion of highly skilled Malaysian workers to 35% by 2030 (Champa, 2023). To remain competitive in a swiftly evolving global economy shaped by advancing technology, Malaysia must swiftly enhance its TVET capabilities, augmenting both the quantity and quality of TVET graduates.

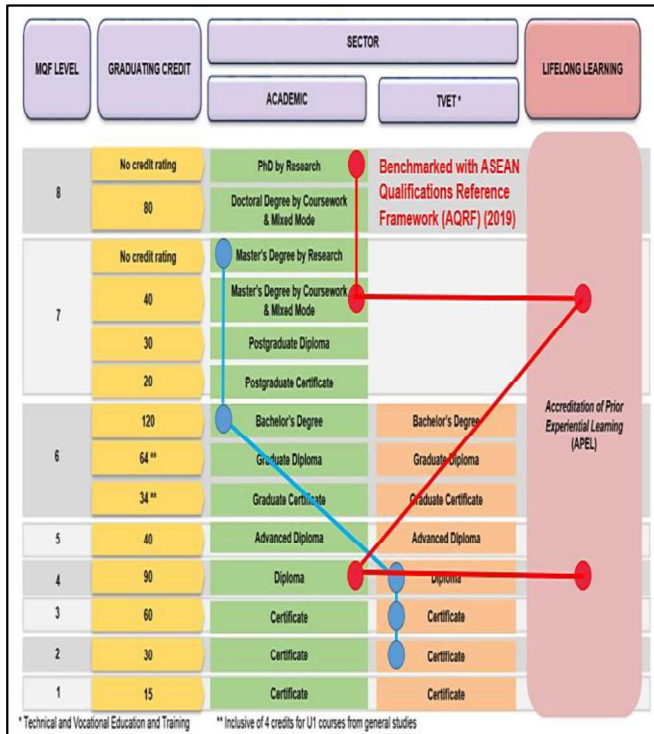


Figure 3 Malaysian Qualification Framework (MQA, 2023)

A strong TVET system relies on four key elements: skills, education, knowledge, and innovation (Alagaraja et al., 2014). When these components work together, they build a cycle of growth and development. This connection is crucial for developing people's skills at different levels - within organizations, regions, and the whole country.

TVET acts as the central link that brings these elements together. It helps develop a skilled workforce and drives progress in the economy and society on a national scale. By combining skill-building, education, knowledge sharing, and innovation, TVET shapes a workforce that meets industry needs and societal changes. This TVET approach not only addresses immediate skill needs but also fosters ongoing talent development. It supports continuous learning and innovation, benefiting individuals, organizations, and the country's economy. Essentially, TVET forms the core in creating a skilled workforce that fuels growth across different areas of society.

Significance of TVET in Malaysia towards Socio-Economic Growth and Future Talent Development

TVET is seen as a pivotal force in Malaysia's journey to attain its high-income nation status (Ministry of Higher Education, 2017). Such a vision accentuates the importance of TVET in fostering sustainable and inclusive socio-economic progress. Specifically, TVET is designated to help those who to master specific skills. As outlined by the 2030

Agenda, TVET is meant to address numerous demands (economic, social, and environmental) by assisting youth and adults in acquiring the skills necessary for employment, decent work, and entrepreneurship, promoting equitable, inclusive, and sustainable economic growth, and supporting transitions to green economies and environmental sustainability (Hamid et al., 2023).

The Twelfth Malaysia Plan 2021 - 2025, emphasizes the pivotal role of TVET in supplying a skilled workforce tailored to industry needs, thus aligning with Malaysia's economic aspirations. A collaborative study conducted by The World Bank, International Labour Organization (ILO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), 2023, highlights the correlation between a robust TVET sector and a nation's journey towards becoming a high-income economy. It emphasizes that countries with well-developed TVET systems tend to exhibit accelerated economic growth due to their ability to meet industry demands effectively.

In a global landscape where competitiveness hinges on technological prowess, TVET emerges as a strategic tool to equip the Malaysian workforce with advanced skills. Azzoni and Arbizu (2013) and Paryono (2017) assert that skilled personnel proficient in operating cutting-edge technologies are vital for sustaining economic growth and international competitiveness. By nurturing a workforce adept at leveraging advanced technologies, Malaysia positions itself to not only reduce structural unemployment but also to supply the global labor market with highly competent individuals.

The strategic integration of TVET into Malaysia's socio-economic fabric holds immense promise for the nation's future. By aligning with global agendas and national economic aspirations, TVET becomes a catalyst for sustainable growth and international competitiveness. As Malaysia strives to attain high-income nation status, investing in TVET emerges as a forward-thinking approach, ensuring that the nation's future talent pool is equipped with the skills essential for navigating the complexities of the evolving global landscape.

Despite the government's concerted efforts to bolster the TVET sector in Malaysia, it continues to confront a decline, a trend underscored by several persistent barriers (Ming Hong et al., 2021). Addressing these barriers comprehensively is crucial to revitalize and strengthen TVET, enabling it to play a more substantial role in Malaysia's economic development, meeting the nation's skill requirements as well as developing future talent.

The Current Situation of TVET in Malaysia

The increased focus on TVET in recent years are reflected in TVET's increased role and prominence in Twelfth Malaysian Plans, 2021 – 2025, respectively. For many decades, the Ministry of Education, Ministry of Higher Education and Ministry of Human Resources have often been the public faces in all matters TVET.

The nation's TVET system has undergone remarkable transformation in recent years, but despite its successes, TVET is still saddled with numerous weaknesses and has not achieved the desired objective of producing sufficient skilled

workers or being a preferred education pathway for most Malaysians. Given the changing economic and technological environments, Malaysia must ensure its skills development system is relevant, quality-based, adaptive, and cost-effective.

Recognizing the imperative to overhaul the TVET landscape in Malaysia, the government took a significant stride by establishing the Majlis Pendidikan Teknikal dan Latihan Vokasional Negara (National TVET Council, MTVET) in December 2020. This council is strategically oriented towards three key goals: integrated and coordinated governance, industry-driven TVET, and the role of TVET in shaping the future. To achieve these objectives, the council has identified five pivotal areas: Governance, Industry, Quality Assurance, Funding, and Branding.

The Twelfth Malaysia Plan delineates three primary objectives - Regenerating the Economy, Strengthening Security, Prosperity, and Inclusivity, and Boosting Sustainability (The Asia Foundation, 2022). Within this comprehensive framework, the strengthening of the TVET system emerges as a pivotal element, integral to the first policy catalyst: Developing Future Talent (Ahmad, 2021). This underscores the recognition of TVET as a crucial driver for nurturing skilled individuals who are vital for economic regeneration and sustainable development.

Simultaneously, the Auditor General's Report underscored the strategic importance of auditing the TVET sector, emphasizing its significance in fueling the nation's growing economy. The emphasis on high government expenditure to cultivate a highly skilled workforce amplifies the importance of addressing the identified shortcomings in the TVET ecosystem (National Audit Department, 2021). This renewed focus reflects a concerted effort to rectify deficiencies within the TVET landscape, aligning it with the objectives outlined in the Twelfth Malaysia Plan. The overarching aim is to position TVET as a dynamic and responsive system capable of meeting the evolving demands of the new economy, thereby contributing significantly to the nation's overall goals.

TVET functions as a pivotal coordinating body that unifies various sectors into a cohesive system, essential for embracing the Fourth Industrial Revolution (IR 4.0) and artificial intelligence (AI) while navigating through unprecedented technological changes (Ming Hong et al., 2021). Malaysia's forward-looking stance on education and skill development is evident in its strong emphasis on TVET within Budget 2024 (Shauqi, 2023). Shauqi (2023) highlights the rising demand for technical skills, emphasizing the need to promote these competencies among Malaysians to cultivate a reservoir of adept professionals. To address this, the government has earmarked RM6.8 billion to overhaul TVET education in collaboration with Government-Linked Companies (GLCs) and private enterprises (Shauqi, 2023).

There are several key issues highlighted regarding the Malaysia's TVET system, as follows:

a) Structural challenges: Despite sustained government support, the TVET system faces hurdles due to multiple ministries' overlapping roles, hindering its smooth operation (The Asia Foundation, 2022).

- b) Quality assurance gaps (The Asia Foundation, 2022): The TVET accreditation process faces challenges, with two main bodies overseeing it: (i) the Department of Skills Development (DSD) in the Human Resources Ministry, which performs accreditation for skills sector; and (ii) the Malaysian Qualifications Agency (MQA) under the Education Ministry, which performs accreditation for vocational and academic programs (Fauwaz, 2023). Efforts have been made in 2021 to unify TVET under the Code of Practice for TVET Programme Accreditation (COPTPA). Despite this, full integration between the skills education sector (governed by DSD) and the vocational and technical sectors (governed by MQA) remains incomplete. Although TVET institutes refer to the National Occupational Skills Standards (NOSS), the standard only provides the competencies required, not the syllabus-specific details needed for each programme (Fauwaz, 2023). Thus, there is a large disparity in the outputs of different TVET institutes, creating a situation where some employers have more trust in the individual TVET institute's internal standards than in the certification itself. In the higher-level (diploma and undergraduate) courses, there is often a tendency towards 'academic' instruction, leaving students short of the practical skills needed by industry. Employers have reported lack of life skills and English proficiency among TVET graduates (Fauwaz, 2023).
- c) Limited industry partnerships (The Asia Foundation, 2022): Collaborations between TVET institutions and industries vary widely across different areas and providers. It's crucial to have stronger industry involvement in designing and assessing curricula to ensure graduates are well-prepared for jobs. The lack of such collaboration has caused a skills gap among many TVET graduates, resulting in employers having to invest time and resources to retrain them (Fauwaz, 2023). Consequently, industries are hesitant to offer higher salaries to fresh TVET graduates. This gap occurs when the skills possessed by graduates don't align with what the job market demands. There are two types of mismatches: qualification level mismatch and skills/knowledge mismatch (Ministry of Higher Education, 2018). Industries don't just seek knowledgeable and skilled workers; they expect graduates to have a well-rounded set of skills, knowledge, and positive social attitudes. The unemployment rate among graduates is also influenced by the mismatch between the specific skills demanded in the job market and the quality of education and training provided by TVET institutions (Ministry of Higher Education, 2018).
- d) Lecturer's competency and inadequacies of infrastructure resources (Yeap et al., 2021): It's crucial to have skilled and competent vocational teachers for effective teaching in TVET. TVET aims to equip students with technical skills and

knowledge relevant to the job market (Ismail et al., 2018). However, the shortage of qualified teaching staff in TVET leads to the hiring of instructors solely based on academic qualifications without considering their practical skills (Ismail & Abiddin, 2014). Research by Hanapi et al. (2015) highlights that inadequate teaching methods, classroom management, lack of industry experience, and disinterest in teaching assigned subjects contribute to unemployment among vocational and technical students in Malaysia. Despite this, Ismail et al. (2018) note that vocational lecturers found difficult in attending professional development programs due to budget constraints, rotational systems, and heavy workloads, which hampers their ability to enhance their knowledge, skills, and professionalism.

- e) Lack of performance-based funding: The absence of direct ties between government funding and performance discourages innovation in TVET institutions (The Asia Foundation, 2022). This hampers improvements in teaching practices and industry engagement.
- f) Branding and negative public perception: Traditionally, TVET has faced the stigma of being seen as inferior to pursuing a university degree, often labelled as a route for students deemed less academically inclined (Amedome and Fiagbe, 2013; Ministry of Higher Education, 2018; Mahuyu and Makochekanwa, 2020; The Asia Foundation, 2022). This perception can lead graduates of TVET programs to doubt their readiness for practical work, potentially impacting their performance negatively (Zelege, 2018). Furthermore, this negative perception of TVET has deeply influenced parental attitudes. Parents tend to steer their children toward academic courses, believing that a university degree guarantees better job prospects (Ming Hong et al., 2021). As a result, students may only consider TVET as a fallback option if they're unable to secure admission to their preferred universities (Afferro and Hassan, 2013). To counter these misconceptions and biases, concerted efforts are imperative to reframe the image of TVET, attract more high-quality applicants, and reshape societal views regarding its significance. Figure 4
- g) Dependency on foreign labours (Ministry of Higher Education, 2018): According to the report by PricewaterhouseCoopers Malaysia (PwC) in 2018, the demand for TVET's workforce by the industry in 2015 was 6.6 million and is expected to increase to 7.98 million by 2030. Meanwhile, the offering of TVET graduates from the public and private TVET institutions was estimated at 142,000 in 2015 and is expected to increase to 188,000 by 2030. Malaysia however, is still unable to provide sufficient number of local TVET workforce to meet the demand of the industry in the country. The country should ensure that the dependency on foreign labours is at the minimum level by developing and offering highly skilled study programmes

specifically for the capital-intensive industries. Figure 5 illustrates the industry's demand and the projected number of TVET graduates by field until the year 2050 (The Study on the National TVET Master Plan Towards a Developed Nation and Direction Until 2050, ILMIA, 2018).

All of the challenges highlighted above the need for streamlined governance, enhanced industry partnerships, revised funding mechanisms, and improved public perception to strengthen Malaysia's TVET landscape.

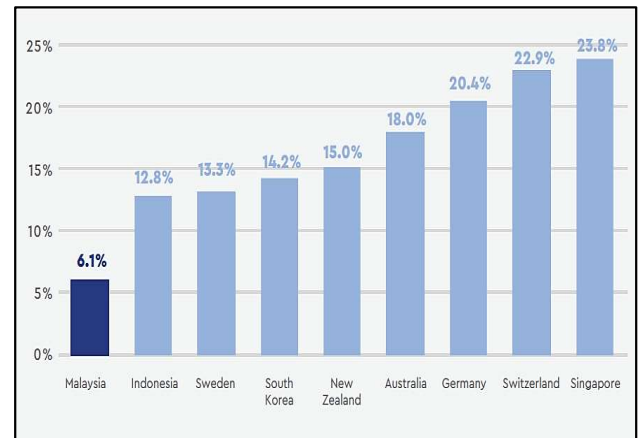


Figure 4 Malaysian Youth Enrolment Rate at TVET Institutions in the Lowest (UNESCO Institute for Statistic, MOF)

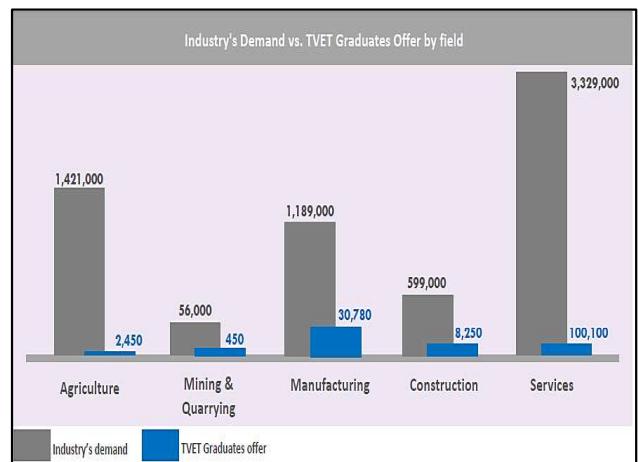


Figure 5 Industry's Demand vs. TVET Graduates Offer by Field Until 2050

IV. METHODOLOGY

This study utilized a systematic review as its methodology, a rigorous approach that involves collecting all possible studies pertaining to a specific topic and design, and systematically reviewing and analyzing their outcomes (EunJin Ahn and Hyun Kang, 2018). Throughout this process, the quality of the studies is assessed, enabling researchers to identify both published and unpublished research documents systematically. The focus of this research leans more towards a retrospective approach, as all data and findings are already available. The systematic review method involves collecting, examining, synthesizing, and summarizing previous research studies or secondary data to uncover evidence that aligns with specified criteria.

This step-by-step process ensures a comprehensive and thorough summary of current findings, laying a foundation for prospective research. Additionally, it facilitates the description of the quality of evidence, allowing researchers to draw conclusions and discuss the strength of these conclusions. In essence, the systematic literature review applied in this research serves as a robust methodology, providing a structured and comprehensive analysis of reports, papers, journals, and articles authored by previous researchers and scholars (Smith et al., 2020; Johnson, 2018).

V. FINDINGS

Diverse TVET models exist globally, displaying various structural frameworks, yet they commonly engage multiple stakeholders with distinct interests. The intricate connections between inputs, outputs, and ultimate impacts on national employment exhibit complexity, influenced by a spectrum of underlying factors (Tripney et al., 2013). To preserve the equilibrium within this system, certain nations opt for robust government-led coordination policies. These policies aim to effectively harmonize inputs with outputs, specifically aligning supply with demand (Robalino and Almeida, 2012).

According to The Asia Foundation (2022), the three core elements that need to be managed in order to create a well-functioning TVET system are:

- a) The strategic dimension, which sets the direction for workforce development that is aligned with the objectives of the economy;
- b) System oversight in term of the regulatory framework and governance of the system, the policies and practices that support the operational functions of the system in terms of the quality of TVET and the pathways of skills upgrading;
- c) Service delivery, which is concerned with results-based management of public and private TVET institutions to ensure the provision of relevant skills development programmes.

A robust TVET system hinges upon the harmonization of four pivotal components: skills, education, knowledge, and innovation (The Asia Foundation, 2022). This synergy catalyzes a self-reinforcing cycle propelling growth and development (Cheong and Lee, 2016). At its core, this integration profoundly impacts human resource development across organizational, regional, and national spheres. Success in TVET, as outlined in an Asian Development Bank report (2017), necessitates a multifaceted approach. This includes establishing a comprehensive policy and strategic framework, ensuring effective institutional coordination, and delivering high-quality training services through accredited programs offered by both public and private providers (Asian Development Bank, 2017). Additionally, it underscores the significance of public awareness campaigns and outreach initiatives aimed at elevating the perception of TVET and encouraging greater participation in skill training programs. Furthermore, fostering linkages with employers and fostering public-private partnerships emerge as pivotal strategies. These alliances are instrumental in ensuring the quality and relevance of training programs, ultimately

fostering increased employment opportunities (The Asia Foundation, 2022). In essence, these interconnected strategies and collaborations collectively drive the efficacy and relevance of TVET, contributing significantly to both individual and societal growth and also future talent development.

The TVET institutions need to adjust the implementation method of their education and training based on science and technology by offering demand-driven courses, especially in closing the competency gap with the main players of IR 4.0 industry (Ministry of Education, 2018). Malaysian TVET framework 4.0 is built upon six thrusts and supported by 11 strategies (Figure 6) in order to achieve six expected outcomes in positioning the dynamic and competitive Malaysian TVET education system globally (Ministry of Education, 2018).

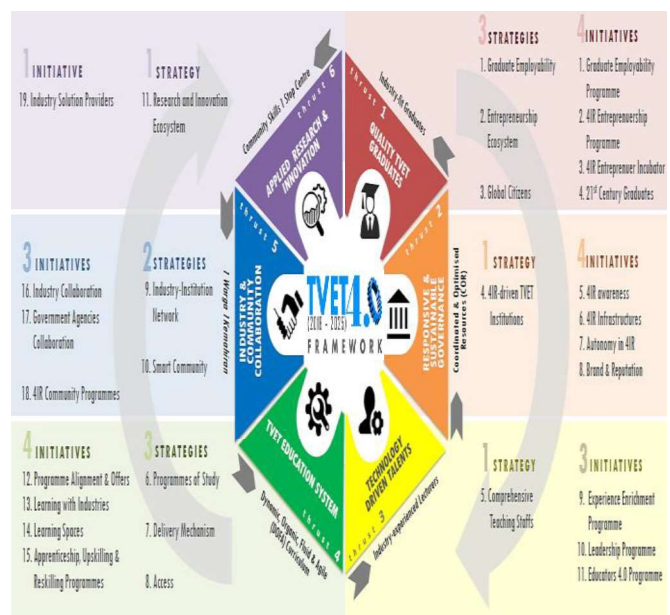


Figure 6 TVET 4.0 (2018 – 2025) Framework (Ministry of Education 2018)

Kahriol and Nor Lisa (2020) suggest that TTVET institutions can diversify their courses by utilizing various online platforms like Massive Open Online Courses (MOOCs), blended learning, and other similar methods. These technologies enable the enhancement of workers' knowledge and skills, fostering continuous learning opportunities. Lifelong learning, as described by Kahriol and Nor Lisa (2020), encompasses personal and professional development through short courses, upskilling, and workforce training offered by TVET institutions.

The integration of new technologies not only facilitates learning but also expands avenues for individuals to explore novel information, techniques, and skills. Given the rapid growth of the workforce, prioritizing access, mobility, and adaptability among TVET workers becomes imperative. To achieve this, TVET should establish a robust framework that aligns within the education system and bridges learning institutions with the evolving job market.

Encouraging the adaptability of TVET professionals involves instilling transversal skills and competencies within TVET programs, incorporating both didactic learning and practical experiences. This approach nurtures a workforce

capable of swiftly adjusting to the changing demands of the industry.

Aligned with the recommendations by Kahirol and Nor Lisa (2020) regarding the diversification of learning methodologies within TVET institutions, the current imperative in Malaysia to establish a comprehensive future skills framework, as highlighted by Banking (2023), echoes the call for lifelong learning and adaptability. The envisioned future skills framework, advocated by Jessica Chew, Deputy Governor of Bank Negara Malaysia (BNM), aims to instill a culture of continuous skills development, mirroring the emphasis on lifelong learning and upskilling as proposed by Kahirol and Nor Lisa (2020) for TVET professionals. Both perspectives underscore the critical need to equip individuals with adaptable skills and align educational frameworks with evolving workforce demands, emphasizing the importance of continuous learning to thrive in dynamic professional environments.

The Malaysian government has embarked on a comprehensive strategy outlined in the "Malaysian Higher Education Blueprint 2015-2025" to elevate higher education institutions, with a particular emphasis on TVET institutions, aiming to transform them into globally competitive entities (MIDA, 2023). This initiative seeks to cultivate a robust cadre of skilled and adaptable TVET graduates, crucial for bolstering the domestic workforce and advancing Malaysia's aspirations to become a regional center of educational excellence (MIDA, 2023).

Acknowledging the pivotal role of TVET within the education landscape, the government integrated TVET into the mainstream education system through the Vocational Education Transformation Plan introduced in 2012, further reinforced by the strategies outlined in the Twelfth Malaysia Plan (12MP) (MIDA, 2023; Unit Perancang Ekonomi, 2021). In a significant show of commitment, the government allocated RM6 billion in 2021 to fortify the TVET sector, signifying a substantial investment in its development (MIDA, 2023).

Numerous initiatives were put forth by academicians and organization, aiming to bolster the TVET ecosystem and craft a future-ready skills framework that aligns with technological advancements, thereby propelling the nation's economic growth and transformation, as follows:

- a) Green TVET: Aligned with global sustainability objectives, the Green TVET initiative integrates environmental education seamlessly into TVET programs. This integration accentuates sustainable practices, nurturing environmental consciousness among graduates and instilling a commitment to sustainability principles (Azimuddin, 2023; Boyd Dionysius, 2023; Kahirol and Nor Lisa, 2020).
- b) Rural Skills Development via TVET: Tailored specifically for rural communities, this initiative strives to democratize access to TVET opportunities. Its extension into rural areas aims to uplift livelihoods, narrowing the urban-rural skills divide and fostering socio-economic development (Geofrey, 2023).
- c) Artificial Intelligence Integration in TVET: Acknowledging the mounting relevance of AI, this initiative endeavors to infuse AI education into

TVET curricula. Equipping graduates with AI competencies anticipate preparing them adequately for the evolving demands of tomorrow's workforce (Asri, 2023).

- d) TVET for Food Security: With a focus on the agriculture sector, this initiative creates avenues within TVET for individuals engaged in farming and related fields. By refining agricultural skills through TVET, the aim is to fortify food security and bolster the competence of the agricultural workforce (Norfaine, 2023).
- e) Digitalization in TVET: Recognizing the pivotal role of digital technologies, this initiative prioritizes the integration of digital literacy and technological advancements within TVET programs. Equipping graduates with digital competencies align with the objective of preparing them for the rapidly evolving digital economy (Arthur, 2023).
- f) Lecturer Competency Enhancement: Acknowledging the pivotal role of educators, this initiative seeks to enhance TVET lecturer competencies significantly. Elevating their teaching abilities and subject-matter expertise aims to elevate the overall quality of TVET programs, ensuring students receive an exceptional standard of education (The Asia Foundation, 2022).

The Asia Foundation (2022), in their research, identified five focus areas that affect the development of TVET toward achieving future skills development and the economic growth of nations. These areas include Governance, Industry, Quality Assurance, Funding, and Branding. Several suggestions and improvements in these areas are as follows:

- a) Governance: The TVET ecosystem can be enhanced through a comprehensive audit across ministries to streamline governance systems, aiming to simplify the institutional framework and focus on Malaysia's skills development aligned with national socio-economic goals. This involves strategic collaboration among ministries and industries, facilitated by the newly formed National TVET Council (MTVET), while granting states, districts, and Economic Corridors shared responsibilities and increased autonomy. Encouraging partnerships through a holistic approach across government and society further strengthens the TVET ecosystem, emphasizing the importance of inter-ministry data sharing for informed decision-making.
- b) Industry: Accord industry with a prominent role in steering the national TVET agenda, not just participating in collaboration. Empowerment and incentives should be provided to TVET institutions to actively engage with stakeholders, particularly industry partners. Encouraging innovative methods to broaden industry partnerships beyond traditional internships and curriculum development is crucial, incorporating elements like student mentorship, project-based learning, and guest lectures among others.
- c) Quality Assurance: To boost the quality and

recognition of TVET, implementing a unified quality assurance system as proposed in the 11th Malaysian Plan's mid-term review is crucial. This system, detailed in the Code of Practice for TVET Programme Accreditation (COPTPA), aims to elevate graduate quality and integrate TVET pathways akin to academic routes. Additionally, conducting a comprehensive TVET provider rating exercise serves to improve overall management and offer transparent feedback on quality to the public. Plans for reviewing approved TVET courses with industry input are underway, although the specific review tool, such as the balanced scorecard, has yet to be released. Ensuring course alignment with industry needs through periodic audit reviews of select TVET providers remains a priority. To attract and retain skilled trainers within TVET institutions, a revamp of remuneration structures and training opportunities is essential. Furthermore, bolstering the capacity of TVET providers necessitates strategies, leadership development, organizational restructuring, and personnel training to effectively implement these changes.

- d) **Funding:** Consider implementing an integrated TVET system that harmonizes roles between industry and government, ensuring cost-effectiveness and relevance. Utilize funding mechanisms to align programs with national priorities, particularly in emerging and IR 4.0 technologies. Introduce performance-based funding from the government to encourage TVET providers to be results-oriented and foster collaboration with local communities and industries. Employ fund-matching and similar schemes to encourage engagement among all stakeholders, enhancing the relevance and efficiency of TVET programs. Additionally, intensify efforts to collect loan repayments from graduated students who benefited from *Perbadanan Tabung Pembangunan Kemahiran* (PTPK) loans during their studies.
- e) **Branding:** To make TVET a preferred educational pathway, strategic national branding efforts are essential, targeting specific groups like students, parents, and industry stakeholders. Emphasizing TVET's role as an entrepreneur incubator will attract high-caliber students to these programs. Promoting collaborative community projects within TVET institutes fosters local connections and enhances the perception of TVET. Additionally, showcasing TVET trainees' involvement in national and international skills competitions through diverse media channels will elevate the image of TVET, inspiring more youths to enrol in these programs.

VI. DISCUSSION AND RECOMMENDATION

In envisioning the future of TVET in Malaysia, a comprehensive strategy unfolds, converging key initiatives pivotal for talent development. The seamless integration of Green TVET mirrors Malaysia's commitment to global sustainability objectives, instilling environmental education

deeply within TVET programs. The integration of Green TVET aligns seamlessly with Malaysia's commitment to global sustainability objectives, emphasizing environmental education within TVET programs. This not only nurtures an eco-conscious mindset among graduates but also instills a commitment to sustainable practices, crucial for Malaysia's role in environmental stewardship.

Additionally, the focus on Rural Skills Development underscores the necessity of democratizing access to TVET opportunities, particularly tailored for rural communities. This extension aims not only to uplift livelihoods but also to narrow the urban-rural skills divide, contributing significantly to socio-economic development.

Recognizing the mounting relevance of Artificial Intelligence (AI), the initiative to integrate AI education into TVET curricula is a strategic move. This anticipates the preparation of graduates for the dynamic demands of Malaysia's evolving workforce, ensuring they are well-versed in AI competencies. Simultaneously, the emphasis on TVET for Food Security, with a specific focus on the agriculture sector, aligns with Malaysia's commitment to ensuring a sustainable and secure food supply. Refining agricultural skills through TVET is crucial for fortifying food security and enhancing the competence of the agricultural workforce, addressing a key aspect of national resilience.

The prioritization of Digitalization in TVET acknowledges the pivotal role of digital technologies in Malaysia's economic trajectory. Integrating digital literacy and technological advancements into TVET programs ensures that graduates are well-prepared for the rapidly evolving digital economy, contributing to the nation's digital transformation goals. Equally crucial is the initiative for Lecturer Competency Enhancement, recognizing the pivotal role educators play in the TVET ecosystem. Elevating their teaching abilities and subject-matter expertise contributes significantly to the overall quality of TVET programs, ensuring that students receive an exceptional standard of education aligned with Malaysia's aspirations for educational excellence.

The TVET ecosystem's enhancement is further envisioned through a comprehensive audit across ministries, aimed at streamlining governance systems. This audit seeks to simplify the institutional framework, directing a laser focus on Malaysia's skills development, meticulously aligned with national socio-economic goals. Facilitated by the newly formed National TVET Council (MTVET), strategic collaboration among ministries and industries is envisaged, with shared responsibilities and increased autonomy granted to states, districts, and Economic Corridors. The holistic approach to partnerships across government and society stands as a pivotal strategy, emphasizing the importance of inter-ministry data sharing for informed decision-making.

In the domain of industry collaboration, an imperative shift is proposed, positioning industry not merely as collaborators but as key drivers steering the national TVET agenda. Empowerment and incentives are deemed essential for TVET institutions to actively engage with stakeholders, particularly industry partners. Encouraging innovative methods to broaden industry partnerships beyond

conventional internships and curriculum development is highlighted. Elements such as student mentorship, project-based learning, and guest lectures are underscored as crucial components for fostering dynamic collaborations.

Quality Assurance emerges as a linchpin in bolstering the quality and recognition of TVET. The implementation of a unified quality assurance system, is deemed crucial. The Code of Practice for TVET Programme Accreditation (COPTPA) serves as the detailed framework for this system, aiming to elevate graduate quality and integrate TVET pathways akin to academic routes. The comprehensive TVET provider rating exercise is envisioned to enhance overall management and offer transparent feedback on quality to the public. The revamping of remuneration structures and training opportunities is highlighted as essential for attracting and retaining skilled trainers within TVET institutions.

In the realm of funding, consider creating a unified system that brings together industry and government roles for TVET. This helps make it both cost-effective and relevant. Use funding methods to match programs with what the country needs, especially in new and IR 4.0 technologies. The government can give funding based on how well TVET providers achieve results. This encourages them to work closely with local communities and industries. Encourage everyone involved to contribute funds, matching what each puts in to make TVET programs more effective.

In the context of branding, strategic national efforts are deemed essential to make TVET a preferred educational pathway. This necessitates targeted initiatives aimed at specific groups such as students, parents, and industry stakeholders. The emphasis on TVET's role as an entrepreneur incubator is envisioned to attract high-caliber students to these programs. Promoting collaborative community projects within TVET institutes is underscored as a strategy to foster local connections and enhance the perception of TVET. Furthermore, showcasing TVET trainees' involvement in national and international skills competitions through diverse media channels is identified as a potent strategy to elevate the image of TVET, inspiring more youths to enrol in these programs.

This comprehensive and integrated framework envisions a transformative future for Malaysian TVET, wherein sustainability, skill development, industry collaboration, quality assurance, funding efficiency, and strategic branding collectively shape a dynamic and forward-thinking educational landscape. Figure 8 depicted TVET Future Skills Framework towards the Malaysian future talent development

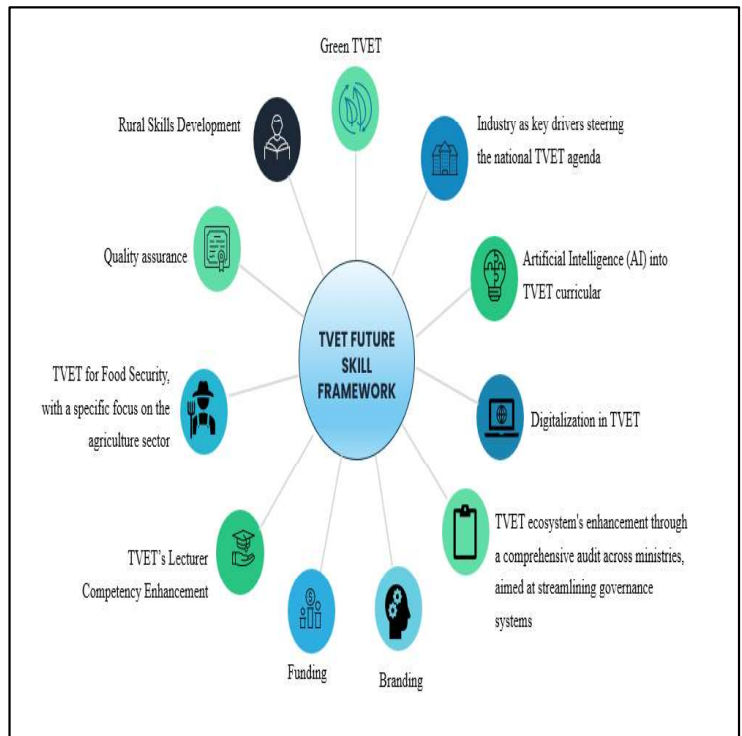


Figure 8 TVET Transformation Framework

Based on the TVET Transformation Plan outlined above, several strategies have been suggested for the future development of skills in Malaysia, including:

- a) Green TVET Integration:
 - Develop specialized modules that integrate environmental education into TVET programs.
 - Collaborate with industries focused on sustainability (for example: industry in solar panel) to create real-world projects and internships for students.
 - Establish partnerships with environmental organizations for practical training and awareness programs.
- b) Rural Skills Development:
 - Tailor TVET programs to address the unique needs of rural communities.
 - Implement mobile or satellite TVET centers to ensure accessibility in remote areas.
 - Offer incentives for industry partnerships to provide mentorship and training opportunities in rural regions.
- c) AI Education Integration:
 - Design AI-focused curriculum modules within TVET programs to equip graduates with AI skills.
 - Foster partnerships with AI industry leaders for internships, workshops, and AI-driven projects.
 - Train TVET educators to ensure proficient delivery of AI-related courses.
- d) TVET for Food Security (Agricultural Focus):
 - Develop specialized tracks within TVET for agricultural skills enhancement.
 - Collaborate with agricultural industries for hands-on training and technology adoption.

- Establish research partnerships to innovate sustainable agricultural practices.
- e) Digitalization in TVET:
 - Introduce digital literacy programs and incorporate emerging technologies into TVET courses.
 - Provide access to cutting-edge digital tools and software relevant to industry demands.
 - Continuous training for educators to stay updated with digital advancements.
- f) Lecturer Competency Enhancement:
 - Offer professional development courses and workshops for TVET educators.
 - Facilitate knowledge-sharing platforms among educators to improve teaching methodologies.
 - Recognize and reward exemplary educators to motivate others.
- g) Governance and Collaboration:
 - Conduct a comprehensive audit to streamline governance systems for efficient skill development.
 - Foster collaboration among ministries, industries, and the National TVET Council for aligned strategies.
 - Encourage data sharing for informed decision-making and resource allocation.
- h) Industry Collaboration Enhancement:
 - Incentivize TVET institutions to engage in dynamic collaborations beyond conventional partnerships.
 - Promote industry mentorship programs, project-based learning, and guest lectures.
 - Create platforms for continuous dialogue and feedback between industry and TVET institutions.
- i) Quality Assurance Implementation:
 - Establish a unified quality assurance system using COPTPA framework for accreditation.
 - Conduct comprehensive TVET provider rating exercises for transparency and improvement.
 - Revamp remuneration structures to attract and retain skilled trainers within TVET institutions.
- j) Funding Efficiency:
 - Create a unified funding system involving both government and industry contributions.
 - Align funding with the country's needs, especially in IR 4.0 technologies.
 - Encourage results-driven funding to promote effective partnerships with industries and communities.
- k) Strategic Branding and Promotion:
 - Develop targeted campaigns to promote TVET among students, parents, and industry stakeholders.
 - Highlight TVET's role as an entrepreneur incubator and showcase success stories.
 - Showcase TVET trainees' achievements in national and international skills competitions

through various media channels.

This comprehensive plan encompasses multiple facets of skills development, aiming to create a holistic and dynamic educational landscape in Malaysia's TVET sector.

VII. CONCLUSION

Drawing from the transformative potential outlined in the TVET Future Skills Framework, it's evident that TVET stands as an indispensable pillar within any nation's educational framework, crucial for its journey toward industrialization. Countries like Korea and Japan have underscored the pivotal role of robust TVET programs in driving sustained economic growth, showcasing the proficiency attained through such initiatives.

For Malaysia to mirror the success of these leading economies, a profound belief in the potency of TVET is imperative. It's crucial to shift the prevailing negative perceptions surrounding TVET, amplifying our focus on these programs to attract more youth. This involves not only encouraging participation but also fostering an environment where employers genuinely recognize and value TVET qualifications.

Moreover, TVET is undeniably pivotal for Malaysia's future talent development. By nurturing skilled professionals through comprehensive TVET initiatives, Malaysia can establish itself as a competitive and innovative global economy. Aligning TVET with technological advancements and industry-relevant skills training ensures our workforce remains adept in navigating the complexities of evolving industries.

However, the crux of success lies in the collective commitment of all stakeholders involved in shaping the nation's human resources. Building a robust TVET ecosystem isn't just about meeting current needs; it's an investment in the future talent pool that will drive Malaysia's competitiveness on the global stage. Through a unified commitment to TVET, Malaysia can chart a course toward a skilled, innovative, and resilient workforce, propelling the nation to unprecedented levels of economic success.

REFERENCES

- Affero, I., and Hassan, R. (2013). Issues and Challenges of Technical and Vocational Education & Training in Malaysia for Knowledge Worker Driven. *National Conference on Engineering Technology*. doi: 10.13140/2.1.4555.2961
- Ag. Asri, Ag. I. (2023). Artificial Intelligence (AI) in TVET. *Sabah TVET Symposium 2023*.
- Ahmad, N. (2021). Majlis TVET Negara: Mandat Baharu Agenda Pemerkasaan TVET. Retrieved from: <https://www.facebook.com/DrNorainiAhmad/posts/269956344493044>
- Ainull, N. A. R., Muhammad Khair, N., and Mohd Faisal, A. K. (2022). Digital Learning in Technical and Vocational Education and Training (TVET) in Public University, Malaysia. *Journal of Technical Education and Training*, Vol.14, No.3, pp. 49-59. Retrieved from: <https://doi.org/10.30880/jtet.2022.14.03.005>

- Alagaraja, M., Kotamraju, P. & Kim, S. (2014). A Conceptual Framework for Examining HRD and NHRD Linkage and Outcomes: Review of TVET Literature. *European Journal of Training and Development*, 38, pp. 265-285. Retrieved from: <http://www.is2015.org/wp-content/uploads/2015/01/HRD-Article2014.pdf>
- Amedome, S. and Fiagbe, Y. (2013). Challenges Facing Technical and Vocational Education in Ghana. *International Journal of Scientific & Technology Research*, 2(6), 253-255.
- Arthur, K. R. (2023). Digitalization of TVET. *Sabah TVET Symposium 2023*.
- Ashari, Z. H. M., & Rasul, M. S. (2014). Determining the issues and concern in Malaysia's TVET agency-industry engagement. *Proceedings of The 10th Asian Academic Society for Vocational Education and Training (AASVET 2014) Conference: Towards A New Stage of VET in Asian Countries*, 1-7.
- Asian Development Bank (2017). Odisha Skill Development Project: Report and Recommendation of the President. Retrieved from: <https://www.adb.org/projects/documents/ind-46462-003-rp>.
- Azimuddin, B. (2023). Green TVET for the Development of Sabah Maju Jaya. *Sabah TVET Symposium 2023*.
- Aziz, H. (2019). Getting Industry to Lead TVET. *New Straits Time*. Retrieved from: <https://www.nst.com.my/education/2019/10/526383/getting-industry-lead-tvet>
- Azzoni, L., & Arbizu, F. (2013). TVET and skills development in EU development cooperation 2012/3080551, final report (p. 14). European Commission.
- Banking (2023). Retrieved from: <https://www.thestar.com.my/business/business-news/2023/06/28/malaysia-needs-future-skills-framework-for-talent-development-bank-negara>
- Boyd Dionysius, J. (2023). The Future of Green TVET in the Development of Green Technology & Renewable Energy in Sabah. *Sabah TVET Symposium 2023*.
- Champa (2023). Employees in Malaysia Urged to Adopt Lifelong Learning Goal. Retrieved from: <https://hrmasia.com/employees-in-malaysia-urged-to-adopt-lifelong-learning-goal/>
- Cheong, K. C., and Lee, K. H. (2016). Malaysia's Education Crisis – Can TVET help? *Malaysian Journal of Economic Studies*, 53(1), 115-134. Retrieved from: <https://mjes.um.edu.my/index.php/MJES/article/download/2782/969/>
- Elfert, M. (2019). Lifelong learning in Sustainable Development Goal 4: What does it mean for UNESCO's rights-based approach to adult learning and education? *International Review of Education*, 65(4), 537-556.
- EunJin Ahn and Hyun Kang (2018). Introduction to Systematic Review and Meta-Analysis. *Korean Journal of Anesthesiology (Kja)*. Doi: 10.4097/kjae.2018.71.2.103. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5903119/>
- Fauwaz, A. A. (2023). TVET in Malaysia: Current Situation, Challenges and Recommendations. *PENANG INSTITUTE ISSUES*, 06 Jan 2023
- Geoffrey, H. T. (2023). How to Develop Rural Skills Using TVET for the Interior of Sabah. *Sabah TVET Symposium 2023*.
- Hajar Halili, S. (2019). Technological Advancements in Education 4.0. *The Online Journal of Distance Education and e-Learning*, 7, 1, 63-69.
- Hamid, H. B. A., Piahat, T. Bin, Haris, N. A. L. A., & Hassan, M. F. (2023). Shades of Gray TVET in Malaysia: Issues and Challenges. *International Journal of Academic Research in Business and Social Sciences*, 13(6), 2152 – 2167.
- International Labour Organization (2003). Technical and Vocational Education and Training for the Twenty-First Century: UNESCO Recommendations. France: UNESCO, 2003
- Ismail, A., and 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*, Vol.19, pp. 7-11.
- Ismail, K., Mohd Nopiah, Z., and Mohd Sattar, R. (2018). Challenges Faced by Vocational Teachers in Public Skills Training Institutions: A reality in Malaysia. *Journal of Technical Education and Training (JTET)*, Vol. 10, pp. 13-27. Retrieved from: <https://doi.org/10.30880/jtet.2018.10.02.002np>
- Kahiro. M. S., and Nor Lisa, S. (2020). Reforming Technical and Vocational Education and Training (TVET) on Workplace Learning and Skills Development. *International Journal of Recent Technology and Engineering (IHRTE)*. ISSN: 2277-3878, Vol. 8, Issues 5
- Kementerian Sumber Manusia, Institut Maklumat & Analisis Pasaran Buruh (ILMIA) (2018). *Kajian Pembangunan Pelan Induk Kebangsaan Latihan Teknikal dan Vokasional (TVET) Ke Arah Negara Maju dan Halatuju Sehingga Tahun 2050*. Cyberjaya.
- Mahuyu, J., and Makochekanwa, A. (2020). Perspectives of Parents Towards Technical and Vocational Education and Training (TVET) in Zimbabwe. *Advances in Politics and Economic*, 3, pp. 1-7. Retrieved from: <https://doi.org/10.22158/ape.v3n4p1>
<https://pdfs.semanticscholar.org/be81/0504cb93d3455acb67dd46acb179d638ec05.pdf>
- Malaysia Productivity Corporation (2022). *Productivity Report 2022*. Retrieved from: <https://irp.cdn-website.com/9c99ef26/files/uploaded/PRODUCTIVITY%20REPORT%202022-460a7ae2.pdf>
- Malaysian Investment Development Authority (MIDA), (2023). *TVET for Sustainable Talent Development*. Retrieved from: [TVET for Sustainable Talent Development - MIDA | Malaysian Investment Development Authority](https://www.mida.gov.my/mida/~/media/Files/Images/TVET-for-Sustainable-Talent-Development-2023.pdf)
- Ming Hong, C., Keong Ch'ng, C., Nazirah Roslan, T. R. (2021). Technical and Vocational Education and Training: Malaysia's Current Scenario and Barriers. *e-Proceedings of the 2nd Young Researchers' Quantitative Symposium*. Eisbn 978-967-2276-41-8

- Ministry of Education Malaysia (2013). Malaysia Education Blueprint 2013-2025.
- Ministry of Education Malaysia (2018). TVET 4.0 (2018-2025) Framework.
- Ministry of Higher Education (2017). Technical Vocational Education & Training (TVET) in Malaysia: Selected Works. ISBN 978-967-14585-1-8
- Ministry of Higher Education Malaysia (MOHE). (2018). Framing Malaysian Higher Education 4.0. Future-Proof Talents. Putrajaya: Department of Higher Education Malaysia. Retrieved from: <http://mdps.upm.edu.my/wp-content/uploads/2019/05/MOHE-3-1.pdf>
- Muthiah, W. (2022). Making TVET the Top Choice. The Star Online. Retrieved from: <https://www.thestar.com.my/news/nation/2022/06/21/making-tvet-the-top-choice>
- National Audit Department (2021). Laporan Ketua Audit Negara Persekutuan 2019 Siri 2. Retrieved from: https://www.audit.gov.my/index.php?option=com_content_&view=category&id=81&Itemid=219&lang=ms.
- Noorazman, A., Tuan, A. T. A., Affero, I., Mohd, H. A., & Siti, N. F. M. N. (2017). Kerangka Pembelajaran Berasaskan Proses Kerja Kurikulum Standard Kolej Vokasional (KSKV) Diploma Vokasional Malaysia. Batu Pahat: Universiti Tun Hussein Onn Malaysia
- Norfaine, S. (2023). TVET Development for Food Security. *Sabah TVET Symposium 2023*.
- Omar, M. K., Ismail, N., Rauf, M. A., and Puad, M. H. M. (2020). Factors on Deciding TVET for First Choice Educational Journey Among Pre-Secondary School Students. *European Journal of Molecular & Clinical Medicine*, 7, pp. 609-622
- Paryono (2017). The Importance of TVET and its Contribution to Sustainable Development. *AIP Conference Proceedings*, Vol.1887, pp. 1-14. Retrieved from: <https://doi.org/10.1063/1.5003559>
- Ramlee, M. (2017). Skills Training and Vocational Education in Malaysia. *Education in the Asia-Pacific Region: Issues, Concerns and Prospects*, 3, pp. 137-153. Singapore: Springer Nature.
- Robalino, D., and Almeida, R. (2012). The Right Skills for the Right Job? Rethinking Training Policies for Workers. (11-48). World Bank.
- Shauqi, W. (2023). Budget 2024: Malaysia Ramp Up TVET Education and Skill Enhancement. The Malaysian Reserve. Retrieved from: <https://themalaysianreserve.com/2023/10/14/budget-2024-malaysia-ramps-up-tvet-education-and-skill-enhancement/>
- Shuib, M. (2019). Developing Future-Proof Graduates. In: *Anecdotes of Academia*. Retrieved from: <https://medium.com/anecdotes-of-academia/developing-future-proof-graduates-730797b808d>
- Sofea, A. (2022). What TVET Needs is Good Dose of Talent Show. Institute of Strategic and International Studies (ISIS) Malaysia. Retrieved from: <https://www.isis.org.my/2022/05/26/what-tvet-needs-is-good-dose-of-talent-show/>
- Syuhada, Y. (2023). Strategic Planning to Transform Malaysian TVET Students into Future Ready Professionals. Issue 20. Retrieved from: www.tvet-online.asia
- The Asia Foundation (2022). Recommendations Towards Improving Technical and Vocational Education and Training in Malaysia. Retrieved from: <https://asiafoundation.org/publication/recommendations-towards-improving-technical-and-vocational-education-and-training-in-malaysia>
- Tripney, J., Hombrados, J., Newman, M., Hovish, K., Brown, C., Steinka Fry, & Wilkey, E. (2013). Technical and Vocational Education and Training (TVET) Interventions to Improve the Employability and Employment of Young People in Low and Middle Income Countries: A Systematic Review. *Cambell Systematic Review*, 9:1, 1-127.
- Twelfth Malaysia Plan, 2021-2025. A Prosperous, Inclusive, Sustainable Malaysia, RMK12 (2021).
- UNESCO (2017). Towards Quality Assurance of Technical and Vocational Education and Training. ISBN: 978-92-9223581-9
- Wheeler, L. (2017). TVET and the UNESCO Global Network of Learning Cities: relevance for countries in the Middle East. *International Journal of Training Research*, 15(3), 245–254.
- Yeap, C. F., Suhaimi, N., Khalid, M., and Nasir, 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, pp. 1818-1839.
- Zelege, T. G. (2018). The Social Perception of Technical and Vocational Education and Training in Ethiopia: A Critical Review. *International Journal of Research Publications*, 3(1). doi: 100315201882