



Effort of Politeknik Malaysia as TVET institute in Attaining Sustainable Development Goals (SDGs) Through Twelfth Malaysia Plan

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Abstract

The introduction and accomplishment of Sustainable Development Goals (SDGs) has been a top priority in Malaysia. SDGs consists of seventeen goals which offers sustainable and good opportunity to reinvigorate in many sectors. Importance of SDGs is well reflected through the alignment of SDGs in the recent five-year national development plans, The Twelfth Malaysia Plan 2021-2025 (Twelfth Plan). Equipped with three themes, reinforced by four policy enablers and fourteen game changers, Twelfth Plan intends to solve current national issues besides rejuvenating Malaysia socioeconomic especially from the challenging period caused by Covid-19 pandemic. Based on Game Changer X stated in the Policy Enabler 1, this paper aims to focus on the role of Politeknik Malaysia as a TVET institute to be an effective tool in producing skilled human resources that can ultimately drive Malaysia to attain sustainable development. Based on this state of affairs, it was found that there are four common goals which can produce a healthy integration between SDGs, Twelfth Plan and Politeknik Malaysia. Through the integration, Politeknik Malaysia is hoped to update their outline and alter their strategy to demonstrate their significant contribution towards building a successful nation.

Keywords: - Sustainable Development Goals (SDGs), Technical and Vocational Education and Training (TVET), Politeknik Malaysia, Fourth Industrial Revolution (IR4.0)

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1. Introduction

Sustainable Development Goals (SDGs) is one of the UN's 2030 agenda, consisting five crucial dimensions; People, Prosperity, Planet, Partnership and Peace (5P). The 2030 agenda envisions unequivocally humankind rights which mainly to eradicate poverty, create job opportunities, access to quality education at all levels, health coverage, gender equality achievement, women and girls empowerment and environmental balance (Canada, 2023). SDGs progressed from the Millennium Development Goals (MDGs), covering all outstanding objectives and taking into account new difficulties while taking advantage of lessons learned during the MDGs'

execution (Halkos & Gkampoura, 2021). Consisting 17 goals, SDGs offer an ambitious revolutionary action plan that addresses major issues pertaining to the socioeconomic and environmental facets of contemporary civilizations. SDGs framework plays a major influence in The Twelfth Malaysia Plan 2021-2025 (Twelfth Plan) where the priorities were created with the goal of "A Prosperous, Inclusive, Sustainable Malaysia" and based on the SDG's "leaving no one behind" theme. Twelfth Plan acts as a roadmap to direct the nation's investment together with the development plans and to track their accomplishment progress towards the designated goals within the 5 years time frame (12th Malaysian Plan, 2021). This comprehensive roadmap is expected to

overcome numerous obstacles, including prioritizing objectives and targets, customizing national strategies and policies, managing trade-offs, and securing enough funding to support the shift to more sustainable development agendas. The acquisition of knowledge and abilities to support development is crucial for positive growth which can be achieved through proper education only.

McGrath et al. and Sousa et al. denoted that education is a type of learning in which a group of people's knowledge, skills, and habits are passed down through teaching, training, or research from one generation to the next. Since it is a significant investment in human development, education has great impact on productivity and growth over the long term. (McGrath et al., 2018)(Sousa et al., 2022). Peaceful environment, sustainable development, and nation-building are seen as benefits of education. Compared to their peers who lack of proper education, children and adolescents who can read, write and count, are more likely to have a better future. Besides that, education has always been the major contributor to economic growth, income distribution, political stability, increased equality of opportunity, human resource skill development, improved health, and low crime rates (Ojiambo, 2009). Globalization necessitates that the world's population quickly adapt to new technologies and learn to use them. Education has an impact on sustainable development that extends beyond developing regions; but the entire world as a whole. The goal of SDG 4 is to provide everyone with an education that will help them improve their lives and the future of their communities (Forhad et al., 2022) (Kipli & Khairani, 2020).

The increased focus on Technical and Vocational Education and Training (TVET) in recent years are reflected via the prominence in the 11th and 12th Malaysian Plans (2016-2020 and 2021-2025, respectively) (Aziz & Subramaniam, 2023). Being touted as game changer, TVET which is the abecedarian means for technically accustoming the youth who'll steer the SDGs programmes towards eradicating poverty, enhancing food security, encouraging gender commission, perfecting quality of life, and sustainable progress (Ogwo, 2018). Strength of TVET institutions depends mostly on the practice of psychomotor skills that are competent with the current needs of industry in order to produce skillful workforce (Bakri & Zakaria, 2018). Recently on February 2023, the future about TVET issues was addressed by Prime Minister of Malaysia, Datuk Seri Anwar Ibrahim during a press met. Few issues were defined such as talent mismatch, unsatisfactory facilities and existing training that is not required by the industry. Immediate steps were proposed especially establishing better partnership involving the private and government agencies to empower TVET programs. It is important to meet the needs of the industry as well as well as preparing TVET students for a suitable jobs with reasonable income (Editorial, 2023). If these issues are not solved, it will cause controversy over the role of TVET in meeting

sustainable development goals (Editorial, 2023). As a TVET institute under Ministry of Higher Education Malaysia, Politeknik Malaysia is of the post-secondary education institute choice for Sijil Pelajaran Malaysia (SPM) graduates for those who are interested in technology and vocational skills-based studies. Politeknik Malaysia has 6 strategic cores where each of them focuses on the important context of National Higher Education. The 6 strategies are as follows; 1) produce quality TVET graduates, 2) strengthen responsive and sustainable governance, 3) enrich talent 4), led the education system through TVET4.0, 5) Strengthen industry and community collaboration and 6) cultivate applied research and innovation.

As far as the authors' knowledge, there is no study conducted in establishing a significant relationship between SDGs, Twelfth Malaysian Plan and Politeknik Malaysia. This review provides insight about the evolution, importance, impact and role of Politeknik Malaysia in attaining SDGs, thus helping in achieving Twelfth Malaysia Plan.

2. Politeknik Malaysia as TVET institute

As mentioned in the Malaysia Education Blueprint 2015-2025 (Higher Education), the Malaysian government has put immense effort in building up the TVET framework and to increase enrolment of students in TVET based institute (Wei & Jamil, 2019). The country's TVET began with the establishment of the Treacher Technical School (named after Sir William Treacher, the Resident General) managed by the Public Works Department Federated Malay States in 1905. After that, this technical school was taken over by the Education Department from 1931 until 1964. During that period, Technical and Vocational Education Division under Ministry Pelajaran Malaysia was established with the responsible of promoting technical education and vocational. In 1995, the Polytechnic Management Division under the supervision of the Technical Education Department (Jabatan Pendidikan Teknikal or JPTek) is responsible for managing polytechnics.

Polytechnic Education was first introduced in Malaysia through the United Nations Development Plan United in 1969 and was further strengthened through an agreement by the cabinet in the Education Plan Implementation (1979) and the National Industrial Plan in 1985-1995. At the year 1991, the Malaysian cabinet has decided to increase the number of polytechnics and graduate lists to meet the needs of semi-professional personnel in the field of engineering, trade and services. The first polytechnic established in Malaysia was Politeknik Ungku Omar, Ipoh, Perak Darul Ridzuan. The vision of Politeknik Malaysia is to be the leading-edge TVET institution and the missions are as follows; 1) To provide wide access to quality and recognized TVET programs, 2) To empower communities through lifelong learning, 3) To develop holistic, entrepreneurial and balanced graduates and 4) To capitalize on a smart

partnership with stakeholders. (Ministry of Education Malaysia, 2018). The current locations of 36 polytechnics in Malaysia are shown in Fig.1.

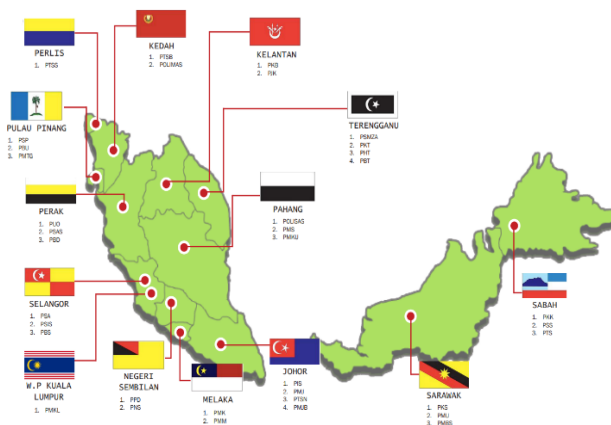


Fig. 1. Polytechnics in Malaysia

The Community Colleges were established on 5 July 2000 at each parliamentary constituency. This is intended to give alternative route to improve skills and techniques for high school graduates besides to improve the socio-economic level of the local community through short courses, certificate level in engineering, technology and services as well as a special skills certificate for students with disabilities. Community college begins operating with 12 pilot colleges in 2001 under the responsibility of JPTEK. In order to reunite the role of Polytechnics and Community Colleges as TVET institute, Polytechnics and Community Colleges were merged under one department on 24 March 2017. The new organizational structure of the Department of Polytechnic and Community College Education (also known as Jabatan Pendidikan Politeknik dan Kolej Komuniti - JPPKK) was approved by the Public Service Department (JPA) on 23 February 2018. Thus, the Polytechnic and Community College Strategic Plan (2018 – 2025) was developed by JPPKK to transform TVET in the national higher education system through strategic initiatives.

The implementation period of the Polytechnic and Community College Strategic Plan (2018 – 2025) is divided into two phases, namely: Phase I (2018 – 2020): Driving System Upgrades and Phase II (2021 – 2025): Moving Towards Excellence. The Strategic Plan consists of 6 core strategies which are to produce quality TVET graduates, strengthen responsive and sustainable governance, enriching talent, leading the education system through TVET 4.0, strengthen collaboration between industry - community and cultivating applied research and innovation (JPPKK, 2021). At present, Politeknik Malaysia offers 8 degrees, 77 diplomas, 2 pre-diplomas and 5 special skills certificate programs with almost 93.7% employability success rate. Based on the report from Economic Planning Unit Prime Minister's Department, TVET in Malaysia is delivered by various institutes from government and private sectors as

illustrated in Fig.2.

Public training institutions are under ministries namely the Ministry of Human Resource (MoHR), Ministry of Education (MoE), Ministry of Youth and Sports (MoYS), Ministry of Regional and Rural Development (MoRRD), Ministry of Agriculture and Agro-Based Industry (MoA), Ministry of Works (MoW) and Ministry of Defence (MINDEF). Recently JPPKK was reassigned under Ministry of Higher Education (MoHE) to conduct TVET programmes with varying quality and standards, parallel to public universities (Economic Planning Unit & Prime Minister's Department, 2015). Besides that, Politeknik Malaysia acts as a provider of skilled worker to meet industry needs besides enabling the students to further their studies in undergraduate degree studies.

3. Sustainable Development Goals (SDGs) and Twelfth Malaysia Plan

Sustainable Development Goals (SDGs) was introduced by the United Nations (UN) worldwide in 2015. Agenda of SDG is to transform the world via by ensuring human well-being, economic prosperity, ending poverty, and environmental protection by the year 2030. Implementation of SDG requires the collaboration of both developing and developed countries (The United Nations General Assembly, 2023). SDGs was evolved from the Millennium Development Goals (MDGs), focusing on all the unfinished agendas of MDGs. MDGs consist of 8 Goals only and focused with 21 targets. Meanwhile, SDGs include 17 Goals with 169 targets, mainly targeted to continue the pending agendas of MDGs, utilizing the experience gained during the implementation of the MDGs, establishing global partnership, sustaining the momentum and taking into account about additional challenges such as inclusiveness, equity, and urbanization (Kumar et al., 2016). The goals under SDGs are as follows; GOAL 1: No Poverty, GOAL 2: Zero Hunger, GOAL 3: Good Health and Well-being, GOAL 4: Quality Education, GOAL 5: Gender Equality, GOAL 6: Clean Water and Sanitation, GOAL 7: Affordable and Clean Energy, GOAL 8: Decent Work and Economic Growth, GOAL 9: Industry, Innovation and Infrastructure, GOAL 10: Reduced Inequality, GOAL 11: Sustainable Cities and Communities, GOAL 12: Responsible Consumption and Production, GOAL 13: Climate Action, GOAL 14: Life Below Water, GOAL 15: Life on Land, GOAL 16: Peace and Justice Strong Institutions and GOAL 17: Partnerships to achieve the Goal.

SDGs is likely to show a pivotal role in 5 different dimensions, namely the People, Planet, Prosperity, Peace and Partnership over the next 15 years (2016 – 2030) as shown in Fig.3 (Economy, 2023). The priorities of the Twelfth Malaysia Plan were developed with the objective of 'A Prosperous, Inclusive, Sustainable Malaysia' and based on SDG's principle of "leaving no one behind". Besides that, the Twelfth Malaysia Plan stresses that SDGs should be implemented from the local level in order to benefit all the Malaysians. Introduced at the year 1965,

The Malaysia Plan (or known as Rancangan Malaysia) is a five-year development plan which assimilate government policies and strategies, guiding the government to achieve anticipated economic and socioeconomic goals. Currently, Malaysia is in the Twelfth Malaysia Plan 2021-2025 (Twelfth Plan) or

known as Rancangan Malaysia Keduabelas 2021-2025, emphasizing on three key themes and underpinned by four catalytic policy enablers as shown in Fig.4. The role of these policy enablers is to form the foundation and building blocks of Twelfth Plan (INTAN, 2022).

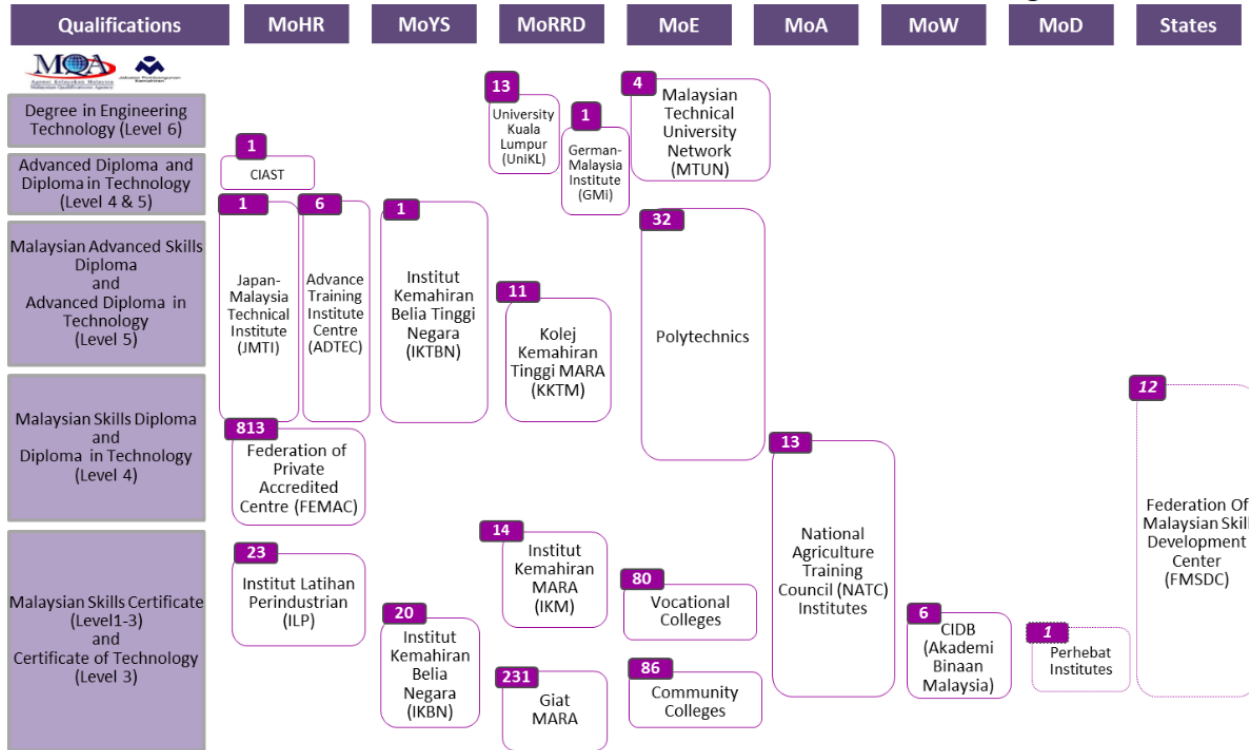


Fig. 2. TVET framework in Malaysia (Economic Planning Unit & Prime Minister’s Department, 2015)



Fig. 3. Seventeen Goals in Sustainable Development Goals (Economy, 2023)

These themes and policy enablers will be supported by fourteen Game Changers. Each Game Changers represent bold and innovative actions to shift mindsets and change the approach to national development. The list of 14 Game Changers is as follows:

- i. Game Changer I: Imperatives for Reform and Transformation
- ii. Game Changer II: Catalysing Strategic and High Impact Industries to Boost Economic Growth

- iii. Game Changer III: Transforming Micro, Small and Medium Enterprises as the New Driver of Growth
- iv. Game Changer IV: Enhancing National Security and Unity for Nation-Building
- v. Game Changer V: Revitalising the Healthcare System in Ensuring a Healthy and Productive Nation
- vi. Game Changer VI: Transforming the Approach in Eradicating Hardcore Poverty
- vii. Game Changer VII: Multiplying Growth in Less Developed States especially Sabah and Sarawak to Reduce Development Gap
- viii. Game Changer VIII: Embracing the Circular Economy
- ix. Game Changer IX: Accelerating Adoption of Integrated Water Resources Management
- x. Game Changer X: Improving TVET Ecosystem to Produce Future-Ready Talent
- xi. Game Changer XI: Enhancing Digital Connectivity for Inclusive Development
- xii. Game Changer XII: Aligning Research and Development towards Commercialisation, Wealth Generation and Economic Growth
- xiii. Game Changer XIII: Transforming the Logistics Ecosystem for Greater Efficiency
- xiv. Game Changer XIV: Transforming the Public Service through the Whole-of-Government Approach

4.0 (IR 4.0) by providing digital economy enabled economy, intensifying Research, Development, Commercialization and Innovation (R&D&C&I) as well as developing essential talent (12th Malaysian Plan, 2021). However, Economic Planning Unit of The Malaysian Government has highlighted many tenacious issues in the labour market and education sector. Some of the issues are low percentage of compensation of employees, incompetent labour market, limited access to quality education and weaknesses in the governance of educational institutions along. In addition, pandemic COVID 19 has also played a major role in creating new norms in work environment and business operation, besides increasing unemployment rate. Hence, the Twelfth Plan focuses on restoring the labour market, education and training through the implementation of Policy Enabler 1 (Developing Future Talent). Among the key initiatives for realigning and restrengthening labour market is by endorsing reasonable compensation for employees such as salary, wage, benefits, bonuses, paid leave, pension funds, and stock options. In addition, enriching the quality of education especially through leveraging emerging technologies based on IR4.0 are expected to improve the downside in education and training system. Policy Enabler 1 can be achieved with the support of Game Changer X, which is to improve TVET ecosystem to produce future-ready talent that can better meet the industry demand. Malaysia will be able to champion the adoption of IR4.0 with the accessibility of skilled technical workers in abundance as an imperative loophole in the existing TVET system could be reduced (Latif & Saari, 2023) (Ishar et al., 2020)(Wafi et al., 2023). To achieve this, TVET institutes should make sure their graduates to be future-ready talent through these strategies:

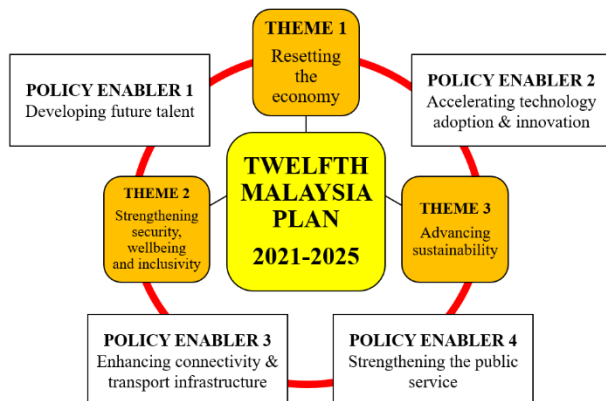


Fig. 4. Twelfth Malaysia Plan (2021-2025)

4. Impact of Twelfth Malaysia Plan on TVET

The formulation of the Twelfth Plan was very critical since the Coronavirus disease (COVID 19) pandemic has altered commercial operations, how people interact and created inequalities in socioeconomic at global level (The Ministry of Economy, 2023). Therefore, The Twelfth Plan is a major national agenda to restore the economic stability as well as holistically regenerate and revive national economic, which will generate higher productivity growth, especially after the COVID 19. Henceforth, for better labour market conditions, most focus must be aligned with Fourth Industrial Revolution

- i. Enhancing the method and quality of delivery and training of TVET through improvement in accreditation, recognition and certification from authorized bodies such as Malaysia Board of Technologists (MBOT), Engineering Technology Accreditation Council (ETAC) and Asia Pacific Accreditation and Certification Commission (APACC). Besides these, The Human Resources Ministry's Department of Skills Development and Education Ministry's Malaysian Qualifications Agency (MQA) accredits the skills sectors and the vocational academic, respectively.
- ii. Introduction of ranking system among TVET institutions to assist the allocation of fundings which will be determined based on employability, wage levels of graduates, industrial engagement and the implementation of social works (such as Corporate Social Responsibility related activities ~ CSR) in rural areas.

A strong TVET ecosystem will act as a vital accelerator for the nation's socioeconomic development, enabling Malaysia to effectively solve enduring concerns such as relying solely on foreign labour, low compensation for employees, and poor student

performance. As part of the emerging technologies, artificial intelligence, virtual reality, and augmented reality will soon leverage the traditional hands-on teaching and learning methods. These applies on laboratory research and development too. These adoption can raise the people's standard of living through flexible labour market like gig workers (Economic Planning Unit of The Malaysian Government, 2021).

TVET demonstrate crucial role in human resource development of a nation by incorporating technologies, sciences, practical skills, attitudes, understanding and knowledge related to current or upcoming occupations in various sectors (Islam, 2021) (Rajadurai et al., 2018). TVET institutions are required to produce high-quality workforce with the exposure of the latest technology to accommodate the request from high-value competing manufacturers (Sulaiman & Salleh, 2016) (Yaakob, 2017). Despite consisting of different vocational programs, IR4.0 pushes the TVET institutions to revise their academic curriculum based on the latest needs of industry for a unanimous goal which is significantly contributing to the national development through progressive economic progress (Ra et al., 2019). Combining formal, informal and non-formal learning, TVET is highly regarded to provide required knowledge and skills which are the value-added components for technical graduate marketability especially in middle-income countries such as Malaysia (Rajadurai et al., 2018). These findings were also highlighted by the Prime Minister of Malaysia, Dato'Seri Anwar Ibrahim where he stressed about the importance of TVET in nation development and the willingness of government to allocate more fundings to uplift TVET in Malaysia (RTM, 2023). Hence Politeknik Malaysia as part of TVET institutes also need to be alert, up-to-date and emerge as a competitive body for the benefit of the students. In other words, TVET-providing educational institutions, such polytechnics should meet the demand of global community by embedding youths with hands-on skills and job readiness through schooling and vocational training (D Cavanagh, G Shaw, 2013) (Victoria Levin et al., 2021). Forhad et al. also agreed in their studies that TVET has the highest ability to ameliorate the rate of employability, efficiency, and incomes of graduates (Forhad et al., 2022). More importantly, polytechnics could impart the proper mindset and attitude among trainees and the future workforce yet appropriate policies and skill-building initiatives need to be strengthened (UNESCO-UNEVOC, 2023).

5. Effort of Politeknik Malaysia in attaining the SDGs

Politeknik Malaysia acts as a TVET provider in Malaysia under the administration of JPPKK which is managed directly by Malaysian Higher Education Ministry (MOHE) as mentioned before. With the education goals of providing TVET graduates who are holistic, competent and capable of contributing to national

development, Politeknik Malaysia is considered one of the leading TVET institute with various recognition from national and international bodies (JPPKK, 2023). The Twelfth Plan's education and training sector strategies include a number of goals for TVET impact, but Politeknik Malaysia's role and effort in achieving the SDGs are still largely unknown and unmentioned.

Nevertheless, Politeknik Malaysia has embarked into proactive commitment in ensuring the achievement of SDG through the launching of POLYGreen Blueprint Polytechnic Malaysia 2015-2020 (BPPM 2015-2020) on 1 April 2015 at Politeknik Merlimau Melaka. BPPM 2015-2020 is a guideline for green practices implementation with the intention of making polytechnic as a superior, excellent and sustainable institution in accordance with its role as a leader in TVET in Malaysia. One of the latest actions done by JPPKK was transforming BPPM 2015-2020 to Blueprint SmartGreen Polytechnic Community College 2021-2026 (BSGPC 2021-2026). BPPM 2015-2020 stresses more towards green technology and contains ten Focus Areas, meanwhile BSGPC 2021-2026 has wider, comprehensive coverage by emphasizing all 17 SDGs contained with seven (7) Areas Focus (JPPKK, 2020).

As a TVET institute, Politeknik Malaysia stands strong at a critical position as a fundamental pillar in addressing knowledge and skills challenges to achieve SDGs through Twelfth Plan as shown in Fig.5. According to the report published by the Commonwealth of Learning, it shows that all seventeen goals in SDGs can be attained through the competencies of TVET itself (Learning, 2022). They also discussed about the role of TVET programs, people engagement, additional skills needed and the best practice with appropriate awareness to assist the success of each goal.

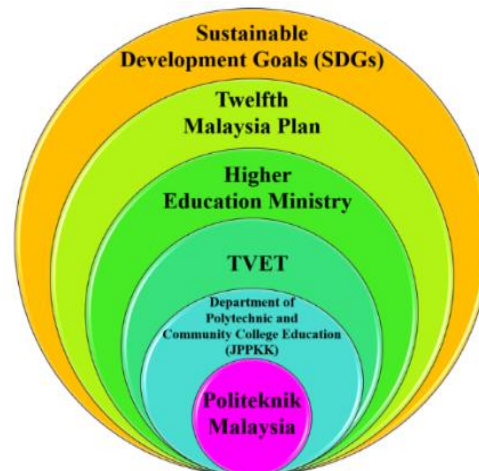


Fig. 5. Position of Politeknik Malaysia in attaining SDGs

This demonstrates that with a proper education system especially polytechnics, the future of any nation can be upgraded as long as the emerging technologies are complied and made-easy-to-access to all levels of human – from government, industries, schools until normal citizens. Anyhow, the present study focuses on the

possible common goals which can interlink TVET, SDGs and Twelfth Plan (Policy Enabler 1 and Game Changer X) with an expectation for decent job creation and economic development. Fig.6 summarizes the relationship which exhibits integration, thus revealing the potential goals between SDGs, Twelfth Plan and Politeknik Malaysia.

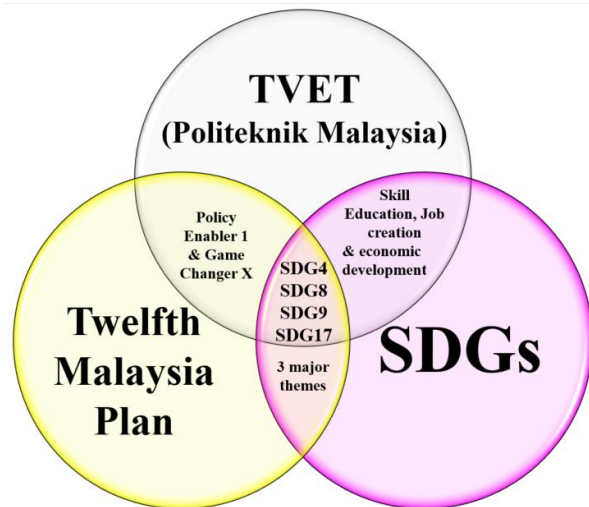


Fig. 6. Mapping between SDGs, 12th Malaysian Plan and Politeknik Malaysia

Based on the integration defined in Fig.4, Fig.5 and Fig.6, the identified potential common goals are SDG 4 (quality education), SDG 8 (decent work and economic growth), SDG 9 (innovation and infrastructure) and SDG17 (partnerships) due to their close relationship with TVET. These findings are also aligned with the report from Bang et al. (Bang & Park, 2021). As stated earlier, the syllabus of polytechnics is based on skills-based education and enhanced with the application of emerging technologies. Besides that, the syllabus and courses of each polytechnic are well monitored by selected industrial panels who ensures that the course outline, skills delivery, machines and laboratory works are at topnotch.

SDG 4 ensures inclusive, equitable quality education and promotes lifelong learning opportunities for all. The target is to increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship. Remarkably, SDG 8 displays interlinks with SDG 4 where SDG 8 promotes sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. For example, if a Green Technology based company has a job vacancy for Solar panel installation (SDG 8 compliance via decent job opportunity), any graduates with Diploma in Electrical Engineering (Green Energy) qualification can easily fill the job requirement as they are well exposed with a necessary technical education (SDG 4 compliance via equitable quality education and skills). Besides that, Politeknik Malaysia also involved in promoting local business through social innovation projects such as research work and collaborating with local food

manufacturers (Tempeh and Trigona Honey) which is SDG 8 compliant (Ismail, 2011). These can be applied in all the courses offered by Politeknik Malaysia such as Diploma in Food Service Halal Practice, Diploma in Urban and Regional Planning or International Business Diploma as it can provide life long learnings.

On the other hand, SDG 9 emphasizes in building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation such as IoT, Big Data, AI or development of electric vehicles (EV). These innovations will shift the market toward new smart technologies, thus increases the demand for the workforce with smart application development skills. To fulfil the demand, Politeknik Malaysia graduates are not only exposed with latest technology related syllabus but also had the opportunities to involve in many skills related competition such as FIRA RoboWorld Cup and WorldSkills Malaysia Belia (WSMB). Nevertheless, the impact of Covid-19 pandemic has forced rapid technological changes to the TVET system. All students and also educators are literally forced to be involved in hybrid or online based education, hence shifting the education style with the intense application of online infrastructures such as Zoom, MsTeams, Google Meet, cloud storage and Skype. Besides that, SDG 9 also targets on enhancing research and upgrading industrial technologies. Knowledge and skills related to emerging technologies are enhanced systematically through the expenditure from the ministry for researchers. With the findings, Malaysia will not only profit in terms of technology development, but also improvement in terms of humanity, culture, and society. R&D&C&I unit in JPPKK plays a key role that covers basic research, applied research, and experimental development for the benefit of the academicians and students by offering TVET Applied Research Grant Scheme (T-ARGS). T-ARGS provides a vast opportunity to members of Politeknik Malaysia to conduct beneficial researches for the community.

SDG 17 encourages and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships in order to achieve significant goals (Ritchie et al., 2018). Politeknik Malaysia has developed strong and close partnerships with industries, government agencies and other academic centers through successful collaboration in R&D which also consists of specific technology groups, industrial projects, funded research projects and consultancy projects. Besides establishing a work-integrated environment for the students, these partnerships are advantageous through sponsoring student internships, curriculum development and workforce training through competent workshops. One of an international partnership is with The Federation of International Sports Association (FIRA) through the annual participation of Politeknik Malaysia in the FIRA RoboWorld Cup. The goal of this collaboration is to use robotic sports as benchmark for state-of-the-art research in robotics which includes autonomous flying robots,

robotics research and urban search with rescue robots which prepare the graduates towards IR4.0. This strategic partnership serves as the main platform for sharing knowledge, carrying out collaborative activities, implementing corporate social responsibility (CSR) programs and conducting research, publication, and consultation.

SDG 4, SDG 8, SDG9 and SDG17 have the common that can be related to all courses in Politeknik which will assist in accomplishing the SDGs and Twelfth Malaysia Plan. Anyhow, other SDGs will not be neglected. Beside the potential common SDGs discussed above, there are still many courses in Politeknik which can contribute specifically to others SDGs. For example, Diploma in Environment Engineering offered by Politeknik Sultan Idris Shah can be related to SDG 13 together with SDG 4, SDG 8, SDG7 and SDG17 as this course is correlated with pollution, control, laws and quality maintenance of environment.

Basically, this research paper also calls for rethinking new approaches and improve current models in use. With this, Politeknik Malaysia is expected to embrace new or to update TVET frameworks that offer SDGs-oriented syllabus and gives good influence towards the marketability of technical graduates.

6. Conclusion

This paper has attempted to exhibit the reinvigoration of TVET system in achieving SDGs. This is greatly needed, since the principles and practices of SDG are important not only in accomplishing the Twelfth Malaysia Plan, but they are essential for the well-being of academician, staffs and graduates of Politeknik Malaysia. This study sought to examine how the SDGs were being implemented at every level and to urge TVET policymakers to give priority in embed SDGs in the curriculum. In this context, few suggestions can be taken note by the ministry especially JPPKK such as:

- i. increasing the interdisciplinary and transdisciplinary among different courses such integrating knowledge of IOT with agriculture, hotel management or food technology courses offered by Politeknik Malaysia.
- ii. to further develop local-level relationship with small & medium enterprise (SME) to properly recognize and manage the influences of local companies on sustainability.
- iii. to bring research closer to community through student – society engagement via the final year student’s project.

Moreover, collaboration, focus on research, networking and keeping up with emerging technologies reinvigorate the role of Politeknik Malaysia to represent TVET institute in attaining the SDGs and Twelfth Malaysia Plan. Achieving SDGs through TVET is a long-term process which entails preservation of environment, implementation of IR4.0 concept, capital investment, mindset changes, social equity, integration of SDGs into

existing TVET governance structures and allowing an abundance of R&D&C&I opportunity among the members.

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