United Nations
Educational, Scientific and
Cultural Organization

Sub-Education Policy Review Report: Technical and Vocational Education and Training (TVET)

Brunei Darussalam
Indonesia
Malaysia
Philippines
Timor-Leste

Contents

Acknowledgements

This Sub-Education Policy Review Report on Technical and Vocational Education Training (TVET) would not been possible without the kind and continuous support from the UNESCO Jakarta Office. In the preparation of this report, we are highly indebted to the Education Director Generals, National Consultants, Technical Directors, Education Specialists, Policy Experts as well as other educational stakeholders from all the five cluster countries; Brunei Darussalam, Indonesia, Malaysia, Philippines, and Timor-Leste who were involved in data collection procedures in all five thematic areas. It is impossible to mention them here by name, but this report would not been possible without their cooperation and participation. I would also like to express my special gratitude and thanks to the Universiti Kebangsaan Malaysia team coordinated and led by Prof. Dr. Mohd Nizam Mohd Said, together with Prof. Dr. Kamisah Osman, Prof. Dr. Lilia Halim, Dr. Lee Tien Tien and Mr. Azizi Alias for their continuous, conscientious and effective work through the whole period of this project. Their personal involvement and dedication were a precondition for completing this report in expected time and shape. Thank you very much.

Dr Mee Young Choi
Head of Education
UNESCO Jakarta.

Executive Summary

Technical and Vocational Education and Training (TVET) is an important part of the education system with the aim of developing skilled workers for a country. For developing countries, including the member states of UNESCO Jakarta namely Brunei Darussalam, Indonesia, Malaysia, Philippines and Timor- Leste; consider TVET as the panacea for economic development and unemployment reduction. SDG4 reinforces the role of TVET to ensure no one is left behind and at the same time contribute to the wellbeing of the nation. Such aspiration is met by providing accessibility of quality TVET education to ALL through a) progressively providing free TVET education and b) ensuring youths who are in the formal or out of the formal education system gain current work-based competencies and the competencies needed in the future. Hence, in achieving SDG4, TVET is offered as a lifelong learning process.

This report presents the education policy review on TVET in relation to the key question: How TVET policy and interventions, of the five cluster countries, are able to meet and achieve SDG 4? This review draws upon UNESCO reports pertaining to TVET policies and initiatives. In addition, a systematic review of empirical studies on TVET (2016-2020) identified from related and major databases (SCOPUS, ERIC and WoS) is conducted. In addition, empirical data was obtained from the implementers and policy makers through a survey questionnaire. The UNSECO reports, review of empirical studies and empirical data are analysed based on the SDG4 and its targets pertaining to TVET. The targets to be attained by 2030 focus on themes that aligns the objectives on TVET towards a) enhancing the participation rates of youth and adolescents in formal and non-formal training, b) providing quality programmes for skills development that meet the industrial needs now and in the future – where to some extend are able to create own jobs and c) enhancing the participation of ALL regardless of sex, age, persons with disabilities, indigenous peoples and children in vulnerable situations.

The key findings from the review are 1) TVET policies are related to each country's national development goals with financing for TVET from various stakeholders, 2) the curriculum of TVET are practical oriented but also focusses on developing the soft skills needed for decent jobs and not only employment in the technical fields, and 3) enhancing the Public and Private Partnership towards providing TVET that meets the industrial needs. Each member state country has put in placed national accreditation for technical education and vocational training as a means to ensure that quality graduates of TVET are able to meet the industrial needs, obtain decent and create own jobs. Nevertheless, all five cluster countries, experienced challenges in implementing the policies that might hinder the acceleration in meeting SDG4 in relation to TVET. Common challenges revolve around mainly on lack of infrastructure, equipment and quality programs and instructors. TVET education and TVET career has been shown to be the last choice for students. Skills identified for industry 4.0 have not been addressed by the TVET programs to ensure capacity growth of youths to be ready for the industry. The review revealed an interesting trend in TVET implementation in the areas of its impacts, implementation status and constraints to the successful implementation. TVET, in the Ministry of Higher Education (MOHE), could advocate a broad range of industry participation opportunities to encourage a range of manufacturers to be involved in preparing highly skilled workers for their industry. These will involve joint projects with training institutions designed to prepare colleges and students with the most up-to - date knowledge and skills needed for global economy work. Given that there are gaps in current technical skills with the technical skills needed for IR 4.0, it is recommended that TVET institutions restructure the learning process of the software, getting to know network structures so as to master big data technologies.

As a conclusion, TVET policies and interventions are put in place by all five countries, and it meets to some extent, the targets of SDG 4. However, review have highlighted aspects of the policies and its initiatives that could be continuously improved. Another particular gap namely the inclusivity component of SDG4 namely embracing the marginalised communities for TVET, needs more attention either through more studies on the issue or developing TVET policies and initiatives addressing the equity issue, especially beyond COVID-19.

List of Abbreviations

11MP	11th Malaysian Development Plan
ADB	Asian Development Bank
AEC	ASEAN Economic Community
ANAAA	National Agency for Academic Assessment and Accreditation
APACC	Asia Pacific Accreditation and Certification Commission
BDNAC	Brunei Darussalam National Accreditation Agency
BDTVEC	Brunei Darussalam Technical and Vocational Education Council
BLK	National training centres
BPS	Private Education Sector
BPTV	*Bahagian Pendidikan Teknikal dan Vokasional*
CATs	Competency Assessment Tools
CBA	Competency Based Assessment
CEOPs	Centres for Employment and Professional Guidance
DA	Department of Agriculture
DILG	Department of Interior and Local Government
DIV	Diploma IV
DSD	Department of Skills Development
DSWD	Department of Social Welfare and Development
DTVE	Directorate of Technical and Vocational Education
EAS TVET QAF	East Asia Summit TVET Quality Assurance Framework
EFA	Education for All
EICF	Energy Industry Competency Framework
EIDPMO	Energy and Industry Department at the Prime Minister's Office
EIQA	Energy Industry Quality Assurance
ETP	Economic Transformation Program
GAA	General Appropriations Act
GEM	Global Statistics Entrepreneurship Monitor
HEIs	Higher Education Institutions
HLIs	higher learning institutes
HRDC	Human Resources Development Council
HRDF	Human Resources Development Fund
HRMD-AS	Human Resource Management Division – Administrative Services
IAC	Industry Advisory Council
INDMO	National Institute for Labour Force Development
IR4.0	Industrial Revolution 4.0
ITIs	Industrial Training Institutes
JPTVET	Technical and Vocational Education and Training Enhancement Committee
KPIs	Key Performance Indicators
KSAP	Knowledge, skills, abilities, and personalities
KV	Vocational College
LGU	Local Government Units
LMICs	low- and middle-income countries
LMIS	Labour Market Information System
MARA	*Majlis Amanah Rakyat*
MBOT	Malaysia Board of Technologists
m-DPBL	Multimedia in the Direct Problem-Based Learning
MoE	Ministry of Education
MoE	Ministry of Education
MoEC	Ministry of Education and Culture

MoH	Ministry of Health
MOHE	Ministry of Higher Education
MOHR	Ministry of Human Resource
MoMT	Ministry of Manpower and Transmigration
MoRTHE	Ministry of Research Technology and Higher Education
MQA	Malaysian Qualification Agency
MQF	Malaysian Qualification Framework
MSCS	Malaysian Skills Certification System
MTUN	Community Colleges and Malaysian Technical University Network
NEPU	National Economic Planning Unit
NESP	National Education Strategic Plan
NKEA	National Key Economic Area
NOSS	National Occupational Skills Standards
NQF	National Qualification Framework
NTTA	National TVET Trainers Academy
NVTC	National Vocational Training Council
OFWs	Overseas Filipino workers
PLPG	Training of the Teachers
PPG	Teacher Professional Education
PPP	Public-Private-Partnerships
PPPM	Malaysia Education Blueprint
PTCACS	Philippine TVET Competency Assessment and Certification System
PTTQF	Philippine TVET Trainers' Qualification Framework
PWC	Price Waterhouse Coopers
RTOs	Registered Training Organizations
S1	Undergraduate Degree
SDFC	Skills Development Fund Corporation
SEPFOPE	Secretariat of State for Vocational Training and Employment Policy
SKKNI	*Standar Kompetensi Kerja Nasional Indonesia*
SMI	Small and Medium Industries
SMK	Revitalizing TVET
SPN21	*Sistem Pendidikan Negara Abad Ke-21*
TAFE	Technical and Further Education
TESDA	Technical Education and Skills Development Authority
TM	Trainers' Methodology
TRs	Training Regulations
TUK	*Tempat Uji Kompetensi*
TVET	Technical and Vocational Education and Training
TVIs	Technical and Vocational Institutions
TVL	Technical Vocational Livelihood
UNESCO	United Nations Organisation for Education, Science and Culture

List of Tables

List of Figures

1.0 Introduction

Technical and Vocational Education and Training (TVET) is designed to provide a population with knowledge and skills that will allow them to successfully secure and retain their jobs. TVET is seen as a mixture of formal, informal, and non-formal learning that provides youths the knowledge and skills they require for employment. According to the United Nations Organisation for Education, Science and Culture (UNESCO), TVET is considered a value-added portion of a general education that integrates technology, sciences, practical skills, attitudes, understanding, and information relating to employment in different economic and social sectors. TVET organizations are big 'workplace suppliers' that will be in the workforce for who will be in the forefront in dealing directly with sustainable issues (Paryono, 2017).

TVET has always been seeing as a catalyst in the national development plans of industrialized nations. It has been shown that TVET in industrialised countries was able to enhance the country's economic development, industrial expansion, and competitiveness. As a result, developed countries adopt the view that TVET is able to assist non-academically inclined individual to secure a job as a semi- or full-skilled worker in a particular career. Rapid developments in the economy and manufacturing processes demonstrate the need for highly skilled professionals with appropriate employability skills to meet the demands of the dynamic labour market of today. Furthermore, it provides a person with essential thinking skills, plus practical skills required to reach the job market.

Employers around the world are searching for highly qualified workers who can adapt to rising workplace diverse needs. This suggests that prospective workers need to go beyond obtaining specialized knowledge for any work and acquire generic or employability skills instead (Gibb, 2004). They must continuously develop knowledge, skills and learning capabilities in order to respond to changing business activities and conditions on the labour market. A central issue about labour market initiatives, particularly those providing TVET incentives, is whether job creation is supplementary. There are adjustments in the net employment rate which are of primary concern to organizations at policy level.

2.0 Policy in TVET

Following a decline in interest from the mid-1990s to the mid-2000s, technical and vocational education and training (TVET) has returned to the agenda of governments and donor agencies internationally, particularly in sub-Saharan Africa and South Asia (King & Palmer, 2010). Political and political communities in many low- and middle-income countries (LMICs) remain attracted by the supposed connection between TVET and a reduction in unemployment, by equipping people with relevant knowledge and skills to respond to job opportunities (see, for example, African Union, 2007). The United Nations Educational, Scientific and Cultural Organization (UNESCO) is one of those that highlights the political significance now attached to higher-order skills and their central position in the global information economy, especially in terms of poverty reduction, economic growth and social stability (UNESCO, 2010a). This change in priorities is evident in the 2012 Global Monitoring Report on Education for All (EFA), which reinforces the emphasis on TVET and skills development which could provide opportunities for marginalized groups (UNESCO, 2012).

TVET has been a crucial investment sector in developing countries and several programs have been put in place to address unemployment problems and boost economic development. However, it is pertinent to note that TVET institutions are faced with the challenges of not responding to the ever-changing skills demands of the economy, which therefore requires the impartation of the knowledge of desired skills to prospective graduates as many graduates rarely possess the required

skills to succeed in the workplace (Nanda, 2010). As a result, industries face challenges acquiring employees with competent soft skills such as communication skills, problem-solving skills, organizational skills, and interpersonal skills (Sodipo,2014; Atsumbe et al.,2008). The need to reduce the current gap in skills requires an increase in the workforce of the 21st century who are trained in a global, dynamic and technical workplace. Teachers responsible for the teaching and preparing of potential technical college graduates should relook into their teaching methods to address the needs of the 21st-century knowledge-based economy.

2.1 Brunei Darussalam

Reforms in Brunei Darussalam focus on a few areas including aligning TVET programmes and curricula with industry needs to increase their relevance. Industry stakeholders are invited to develop the National Occupational Skills Standards (NOSS) and support the formulation of the TVET curriculum through the process of DACUM ('Developing a curriculum'11). Brunei also focuses on increasing apprenticeship courses by working closely with industries and promoting a dual education system. In addition, a new system for the recruitment of TVET teachers that emphasises the importance of industry experience is also in progress.

Brunei Vision 2035 (Wawasan Brunei 2035) policy (Figure 1) introduced on 2007 aims to transform Brunei Darussalam by 2035 as a nation widely recognised for the accomplishment of its educated and highly skilled people as measured by the highest international standards; a quality of life that is amongst the top 10 nations in the world and yet dynamic and sustainable economy with income per capita within the top 10 countries in the world. This is followed by SPN21 (Sistem Pendidikan Negara Abad Ke-21) in 2009 which emphasizes on re-evaluating and re-assessing the education structure, the curriculum assessment and the technical education in Brunei Darussalam. Its goal is to reposition TVET as an alternative post-secondary education capable of producing highly skilled workers in line with the needs of the industry (TVET Brunei, UNESCO 2018).

Brunei Vision 2035 (Wawasan Brunei 2035)
Transform Brunei Darussalam by 2035 as a nation widely recognised for the accomplishment of its educated and highly skilled people as measured by the highest international standards
SPN21 (Sistem Pendidikan Negara Abad Ke-21)
Reposition TVET as an alternative post-secondary education capable of producing highly skilled workers in line with the needs of the industry

Figure 1. TVET Policies in Brunei Darussalam

2.2 Indonesia

Current trends, policies, and practices with regard to TVET in Indonesia emphasis on various aspects: a) Revitalizing TVET (SMK), b) Shifting the vocational education paradigm, increasing more practical skills than theoretical knowledge, c) Prioritising skills development in economically vibrant occupations, d) Shifting the enrolment share of general education to vocational education, e) Strengthening digital literacy, f) Improving the TVET quality through Public-Private-Partnership by fostering cooperation between TVET institutions and industrial partners, g) Improving teachers' quality through training and certification and h) finally promoting entrepreneurial skills.

A few policies (Figure 2) have been revised and introduced to promote TVET education which includes Manpower Act No. 13/2003 regulates the national vocational training system, ensuring that the preparation for work is in accordance with demands from the labour market. Then, Decree No 38/2013 introduced the establishment of accreditation bodies to ensure accreditation standards of TVET providers. Accordingly, National Industry Development Plan 2015-2035 focuses on the development of human resources by facilitating competency testing centres (Tempat Uji Kompetensi/TUK), human resources certification centres, and Indonesian National Work Competency Standards (Standar Kompetensi Kerja Nasional Indonesia/SKKNI) in the field of education. This is also aimed at developing a people-based economy and enabling small and medium industries (SMI) to be a main source of employment, productivity, and economic growth between 2025-2035.

Recently, Presidential Instruction Number 9/2016- The Presidential Instruction on 'Revitalizing TVET' in the framework of Improving the Quality and Competitiveness of Indonesian Human Resources' aims at improving vocational education and enabling learners to be more competitive in the global labour markets. In ensuring that vocational education is responsive to the labour market needs, the Ministry of Education and Culture (MoEC) is now directing secondary vocational schools to focus on six priority areas, namely tourism, maritime programmes, food security, creative industries, energy, and construction (TVET Indonesia, UNESCO 2020).

Manpower Act No. 13/2003
Regulates the national vocational training system
Decree No 38/2013
Ensure accreditation standards of TVET providers
National Industry Development Plan 2015-2035
Facilitating competency testing centres, human resources certification centres, and Indonesian National Work Competency Standards
Presidential Instruction Number 9/2016
Improving vocational education and enabling learners to be more competitive in the global labour markets

Figure 2. TVET Policies in Indonesia

In Indonesia, a range of Ministries are responsible for TVET. However, the most prominent ones include the Ministry of Education and Culture, the Ministry of Research Technology and Higher Education (MoRTHE) and the Ministry of Manpower and Transmigration (MoMT). The Ministry of Education and Culture is responsible for planning and implementing educational services at primary and secondary levels. It carries out its functions through the Directorate of Technical and Vocational Education (DTVE) along with the help of central sub-units. Central sub-units include the General Secretariat, the National Institute for Educational Research and Development, the General Inspectorate, the General Directorate of Basic and Secondary Education, the General Directorate of Higher Education, the General Directorate of Non-formal and Informal Education, and the General Directorate for Quality Improvement of Teachers and Education Personnel. The Ministry of Research Technology and Higher Education is responsible for vocational education at the tertiary level, i.e. polytechnics. Meanwhile, the Ministry of Manpower and Transmigration is responsible for national training centres (BLK) that prepare citizens, especially school leavers, for the world of work stipulated by the Law on National Education No. 20 of 2003.

2.3 Malaysia

TVET in Malaysia is geared towards increasing skilled human capital by providing quality education and training that is responsive to labour market needs and provides resources for further education or entrepreneurial pursuits. The key impetus of the Malaysian TVET strategy as outlined in the 11th Malaysian Development Plan 2016-2020 (11MP), includes improving the efficiency of the labour market to accelerate economic growth, transforming TVET to meet industry demand; strengthening lifelong learning for skills enhancement; and improving the quality of the education system for better student outcomes and institutional excellence.

In this context, TVET is identified as a game changer in how Malaysia produces skilled talent. Shift 4 of The Malaysia Education Blueprint 2015-2025 (Higher Education) outlines TVET as an important pathway for vocational education and skills development, and lifelong learning. The strategies and corresponding initiatives (Figure 3) in support of the Education Blueprint, are consistent with UNESCO's Recommendations on TVET and include:

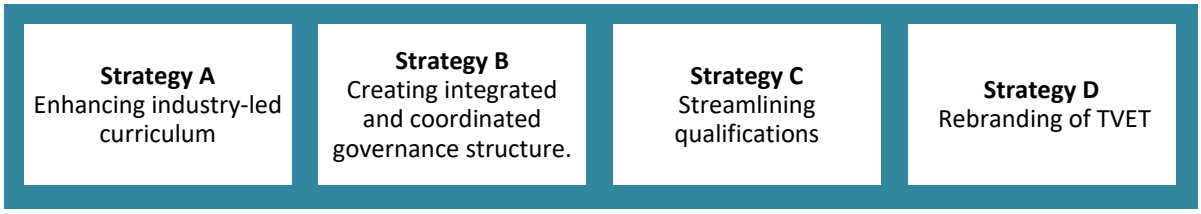


Figure 3. TVET strategies in Higher Education Blueprint (2015-2025)

Malaysia is currently implementing certain reforms to its TVET system. The Technical and Vocational Education and Training Enhancement Committee (JPTVET) focuses, among others, on the issues of TVET such as alignment, articulation, funding, and employability. It also includes Vocational College (KV), Polytechnics, Community Colleges and Malaysian Technical University Network (MTUN) articulation plans. As part of the 11MP, a TVET Masterplan Study on the demand and supply of human capital requirements was conducted by Ministry of Human Resource (MOHR) and Price Waterhouse Coopers (PWC), a professional services firm that carries out audit and assurance as well as tax and consulting services. It is expected to look at the industry engagement model, the TVET financing model, matching demand to supply, strategic collaboration among TVET providers and efforts to achieve a high percentage of skilled workforce by 2020.

Meanwhile, Malaysia Board of Technologists (Act 768/2015) established the Malaysia Board of Technologists (MBOT), a specialized body that registers and recognizes Professional Technologists as well as Certified Technicians as professionals. MBOT expands its function vertically and horizontally. The focus is on technology-based professions that cut across discipline based on conceptual design to a realized technology and covers from technicians (with SKM/Diploma Level) up to technologists (Bachelor's Degree level and above) (TVET Malaysia, UNESCO, 2019).

In Malaysian context, implementation of the Vocational Education Transformation Plan divided into the phase of surge (2011-2013), the phase of improvement (2014-2016) and the phasing phase (2017-2020) has led to a major change to the education system in Vocational Secondary Schools has been transformed into Vocational College (KV) (KPM, 2011) (Figure 4). Transformation in 71 KV's has led to changes including curriculum structure, co-curriculum, working time, assessment system, student recruitment process, infrastructure, level of study, human resources, administrative system, and 5S system (BPTV, 2012).

11th Malaysian Development Plan 2016-2020
Transforming TVET to meet industry demands
Shift 4 of The Malaysia Education Blueprint 2015-2025 (Higher Education)
Outlines TVET as an important pathway for vocational education and skills development
Malaysia Board of Technologists (Act 768/2015)
The focus is on technology-based professions that cut across discipline based from conceptual design
Vocational Education Transformation Plan phase of surge (2011-2013), the phase of improvement (2014-2016) and the phasing phase (2017-2020)
Transformation in 71 KV's has led to changes in curriculum structure, co-curriculum, working time, assessment system, student recruitment process, infrastructure, level of study, human resources, administrative system, 5S system, and more
Polytechnic Transformation Plan
Create new capacity in the creation of the nation's human capital to meet the current economic model needs that are focused on innovation and creativity

Figure 4. TVET Policies in Malaysia

In addition, Malaysian policy makers have included entrepreneurship in TVET 's curriculum. The primary objective of every program of technical education and vocational training is to produce enough people with the right skills to fulfil labour market demands. Both technical education and vocational training programs face the task of balancing the students ' skills, expertise and attitudes of the students of the system to the needs of the labour market. It seeks to establish competent and self-reliant people in Malaysia to contribute to the country's economic and social growth, by developing and leveraging new job opportunities (Mohammad et al., 2019). It in effect strengthens all Malaysians' livelihoods by cutting poverty profoundly and sustainably.

Therefore, in line with the First Thrust of Malaysia Education Blueprint 2015-2025 (Higher Education), it needs to match local needs along with global appeal to build an education system capable of producing integrated, healthy, and entrepreneurial individuals who would become job creators. The goal of the Polytechnic Transformation Plan was to create new capacity in the creation of the nation's human capital to meet the current economic model needs that are focused on innovation and creativity. This is in line with the National Mission's Second Thrust, which is to improve awareness and innovation capacity while fostering 'first-class mindset' (Ali et al., 2017).

In addition, Malaysia is seeking to increase student participation in TVET to support the Government 's search for more medium- and high-skilled jobs under the Economic Transformation Program (ETP). This business now accounts for just 25% of the labour force (Eleventh Malaysian Plan, 2016 –2020). Malaysia Education Blueprint 2015-2025 (Higher Education) stresses that Malaysia needs students who can effectively overcome complex problems such as global warming, economic crises and others. Graduates therefore required not only the right skills and technological experience but also the capacity to make ethical decisions and the ability to cope with rapid change. The 2012

McKinsey Study, Education to Employment, showed that over 70 percent of universities believe that they have adequately prepared students for the workplace. However, only 40 percent of employers' belief students are sufficiently prepared for the workplace.

2.4 Philippines

The overarching short-term and long-term objective of Technical and Vocational Education and Training (TVET) in the Philippines is to ensure national development through accelerated human capital development by providing lifelong learning opportunities for all. The following key documents help guide the development of TVET in the Philippines (Figure 5).

RA 10647 – The Ladderized Education Act/2014
The law allows TVET graduates to proceed to college to pursue a degree without having to take the course programme all over. Units shall be credited from a technical or vocational course to a college degree programme.
RA 10931 – The Universal Access to Quality Tertiary Education Act
The Universal Access to Quality Tertiary Education Act provides free tuition and other school fees in state and local universities and colleges as well as state-run technical-vocational institutions.
RA 10968 – The Philippine Qualifications Framework (PQF) Act/2017
The law establishes the PQF which shall describe the levels of educational qualifications and set the standards for qualification outcomes.
National Technical Education and Skills Development Plan (NTESDP) 2018-2022
Aims to mobilize, galvanize and strengthen the TVET Sector

Figure 5. TVET Policies in Philippines

TVET in the Philippines will follow a two-pronged approach: TVET for Global competitiveness and Workforce Job-Readiness, and TVET for Social Equity. Firstly, TVET for global competitiveness seeks to ensure that the training regulations, curriculum, and school facilities and equipment comply with global standards. The targeted beneficiaries include workers that need skills upgrading, students of higher-level qualifications, overseas Filipino workers, and the unemployed. Similarly, TVET can prepare senior high students under the Technical Vocational Livelihood (TVL) track. Grade 10 graduates who fail to complete senior high, as well as out-of-school youth are also targeted for workforce job-readiness by providing them with the required competencies to prepare them for the world of work. Secondly, TVET shall provide social equity. This is based on the universal principle of social inclusion, and places people, particularly those who are socially excluded and displaced (such as informal workers, indigenous peoples, farmers, fishers, drug dependents, rebel returnees' persons with disabilities, displaced Overseas Filipino workers (OFWs) with low-level skills, victims of abuse, human trafficking, and disasters) into the mainstream of society (TVET Philippines, UNESCO,2019).

2.5 Timor-Leste

Various strategies and policy documents guide the TVET and skills development as shown in Figure 6.

Timor-Leste Strategic Development Plan 2011-30
Consists of short, middle and long-term plans with the focus of a) developing TVET plan, b) implementing related training, centres and policies to enable the realization of the development plan and c) quality graduates produced for social and economic structure of Timor-Leste respectively
The National Technical and Vocational Education and Training Plan 2011-2030
The TVET plan aligns its objectives with the Timor-Leste Strategic Development Plan
National Education Strategic Plan (NESP) 2017-2030
In relation to TVET, NESP targets 60% of the school age population enrol in secondary technical schools
National Employment Strategy 2011-2030
TVET is a strategic area in the NES with the ultimate aim to create quality jobs and decent work

Figure 6. TVET Policies in Timor-Leste

TVET programmes in Timor-Leste provide flexible pathways for various types of learners. Those who are follow the TVET courses in the formal system are able to enter the labour market after completing at any level of the programme structure. Students have the choice to join employment after successful completing a particular level. The levels offered are at certificate and diploma. In ensuring equity in learning and enabling students to secure a decent job, TVET programmes provide Foundation courses for lower-secondary dropouts. In addition, workers with experienced but lacked qualification can enter the formal TVET programme at the appropriate level of certificate after passing the admission examination.

TVET programmes at the upper secondary level are taught in fields, such as agriculture (Technical School for Agriculture) and construction (Technical School for Construction), while at the Polytechnics level focus on equipping students with industry related skills (UNESCO 2020, TVET Timor-Leste). Vocational Certificate programmes are offered in the technical areas such as automotive repair, general mechanics, ICT, agricultural mechanics, electronics, civil engineering, etc. Despite setting up TVET programmes through the formal system, non-formal and informal vocational training (such as small business and entrepreneurship training) is still the mode of apprenticeship especially for the marginalised groups and unemployed.

In terms of governance, three key ministries are responsible for the TVET education in Timor Leste namely- 1) Ministry of Education (MoE) - for technical secondary schools; 2) Secretariat of State for Vocational Training and Employment Policy (SEPFOPE) and its TVET regulatory body i.e. the National Institute for Labour Force Development (INDMO) - for post-secondary TVET; and 3) National Agency for Academic Assessment and Accreditation (ANAAA) - for private institutions delivering higher education (UNESCO 2020, TVET Timor-Leste)

Similar to the other countries, the TVET education in Timor-Leste, developed a 'market-led and an industry-driven economy' education system so as to prepare the skills of students to meet the industry needs. Various centres and systems are established, such as Centres for Employment and Professional Guidance (CEOPs) Centres and Labour Market Information System (LMIS) to ensure the execution of such partnership and collaboration.

3.0 Objective

The objective of this review is two-fold. First, the review draws upon published research in reputable journals. The journals are identified through a systematic review of studies on TVET with implications on policies. Second, empirical study was conducted with the policy makers and implementers of TVET. Based on both types of data, this review aims to assess the major challenges in TVET with a view to make recommendations for the best practice in future policy development and implementation. Impact of COVID-19 on TVET policies was also referred.

4.0 Methodology

To achieve the first objective, a systematic literature review was conducted on previous empirical papers on TVET. Papers were selected in Jun 2020 with search terms "Technical Vocational Education", "VET", "E-learning", "Employability Skill", "Community college" and "competency standard" from three databases: SCOPUS, ERIC, and Web of Science (WoS). During the initial phase, there was no limitation on searching relevant studies, all research papers, concept papers, conference and other technical or government reports. Hence, the search found a total of 43 papers which stated about TVET. In the second phase the number of articles were reduced to 18 articles that, satisfied the inclusion criteria i.e. (1) The selected articles were limited to those published from 2016 to 2020, (2) The studies conducted with TVET students/trainees at any level of the formal TVET training and (3) The studies origin from Brunei Darussalam, Indonesia, Malaysia, Philippines and Timor-Leste.

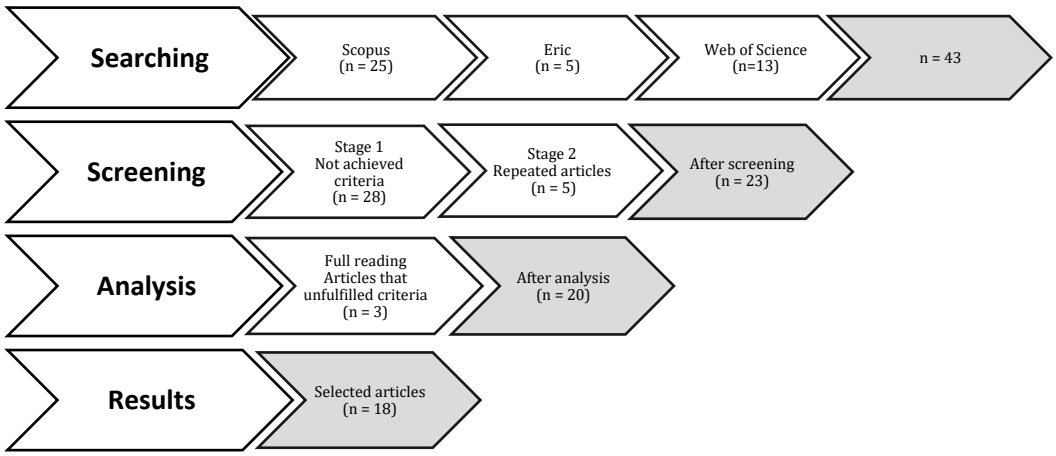


Figure 7. Article selection process
Adapted from Karabulut-Ilgu, Jaramillo Cherrez & Jahren (2018)

The following step is to identify articles and previous studies that are repeated through the reading of titles and abstracts each. The final analysis is done by reading a full and depth reading of the remaining articles to take out the articles that are not relevant to the research needs. As a result of the search and filtering process, 18 articles were selected (Table 1).

Table 1 Overview of studies identified in the systematic review

Author	Country	Studies
Abdullah et al. (2019)	Malaysia	This study seeks to define the level of general competency of vocational college TVET lecturers in civil engineering construction technology (CTCE) using the standard skill model.
Rajadurai et al. (2018)	Malaysia	This research aims to explore the difference between the main attributes of professional graduates of Higher Education Institutions (HEIs) and their actual job output of these attributes as assessed by the Human Resource Managers. Such attribute dimensions are studied in four main fields, namely awareness, skills, abilities, and personality.
Dogara et al. (2019)	Malaysia	This study thus investigated the impact of project-based learning on soft skills development among skilled students at technical and vocational colleges. The study found that collaborative skills building has a strong positive connection to soft skills
Hassan et al. (2018)	Malaysia	This research examines the factors influencing enrolment. In addition, this analysis assesses the variable contributing to graduate output at process level. Lastly, this study obtain input from industries on the student's quality industrial training at the production level. It is recommended that further re-investigation be carried out at the production level to obtain more detailed feedback towards reduction between HTVET offering and demand from industries.
Winarno et al. (2018)	Indonesia	This study discusses the impacts of the multimedia teaching and learning for Computer Networks subject in the Direct Problem-Based Learning (m-DPBL) approach in Dian Nuswantoro University, Indonesia
Suartini (2019)	Indonesia	This research aims to expose a pattern of teacher efforts focused on quality control in preparing and executing student learning activities in Indonesia's vocational education system. The success is attributed to teachers' ability to establish laboratory instruction that is tailored to the school's laboratory capacity.
Kamaliah et al. (2018)	Malaysia	The purpose of this paper is to determine the effect of supervised work experiences, among other factors, on undergraduate vocational trainees' acquisition of employability skills.
Hashim et al. (2019)	Malaysia	This study was conducted to investigate whether the knowledge building process in an open learning environment would assist TVET practitioners in performing tasks that needed to be completed as an significant element in evaluating one of their class subjects
Mohammad et al. (2019)	Malaysia	This study focuses on the students' internal elements holistically to increase student entrepreneurial aspirations and boost entrepreneurship as one of Malaysia's chosen careers in meeting the challenges of the Malaysia Education Blueprint's first shift 2015-2025
Ana et al. (2019)	Indonesia	This study is an international research collaboration of RAVTE (The Regional Association for Vocational Teacher Education in East and Southeast Asia) members which analyses the assessment of students' internship using Competency-Based Assessment (CBA) approach.
Mustafa et al. (2019)	Malaysia	This study was carried out to verify the measurement model of the construct of job satisfaction among technical teachers in Technical Vocational College Ministry of Education.

Abdul Karim & Maat (2019)	Malaysia	The focus of this research is to build a predictive model for estimating the probability of acquiring high-level employability skills among engineering technology students at one of Malaysia's technical institutes.
Mahazir (2019)	Malaysia	The study aims to investigate the disparities in seeming degree of competence perceived by gender for majoring in hospitality vocational students. The result thus indicates that male employability skills are more competent in hospitality compared to female students in vocational colleges.
Ismail & Hassan (2019)	Malaysia	This study identifies the technical skills for TVET graduates needed by industries for future industrial revolution. This means that new technological skills for their potential knowledge should be incorporated in the current technology curriculum, to suit the need for technology changes.
Ali et al. (2017)	Malaysia	The aim of this study was to evaluate the usage of Facebook as an educational technology tool in entrepreneurship course in TVET institution particularly Polytechnic Malaysia.
Kamin et al. (2018)	Malaysia	To enhance and expand the standard and quantity of technicians in the automotive industry, this paper is structured as a comparative study between technical and continuing education institutes in Australia and community colleges in Malaysia.
Hassan et al. (2019)	Malaysia	The main aim of this study is to investigate the mediation impact of corporate image and satisfaction of students on the relationship between the standard of service and the loyalty of students to higher learning institutes (HLIs) in professional vocation and education (TVET).
Ashari et al. (2019)	Malaysia	This study examines the relationship between career interest, knowledge, adaptability and maturity in predicting career choice among 720 students in the Malaysian Skills Certification System.

To achieve the second objective, a questionnaire was distributed to each of the member state of UNESCO-Jakarta. There are two parts to the questionnaire: a) A total of 37 Likert scale-based items where respondents need to provide their opinion on SDG4 indicators related to TVET, and b) Three open- ended questions in which respondents are encouraged to provide their views on (i) challenges related to TVET, (ii) provide recommendations to improve TVET programs and (iii) how each country responded COVID-19 with respect to TVET programs. The same open-ended questions were given to high ranking officers in the Ministry of Education in each member state.

5.0 Findings

This section reports the outcome of a) Systematic Literature Review study and b) Empirical study which is the questionnaire. Each outcome is discussed based on the SDG4 targets of the TVET.

5.1 Systematic Literature Review Findings

Figure 8 shows the percentage of previous studies related to the TVET that have been published over the last 5 years (2016 – 2020). A total of 18 studies from two (2) countries of five (5) member states were identified. The study consisted of 15 (79%) study from Malaysia and 3 (21%) studies from Indonesia. There were no research articles found from Brunei Darussalam, Philippines, and Timor-Leste regarding TVET studies. Thus, for the aforementioned countries, related sources such as UNESCO studies and reports related to TVET and SDG4 are referred.

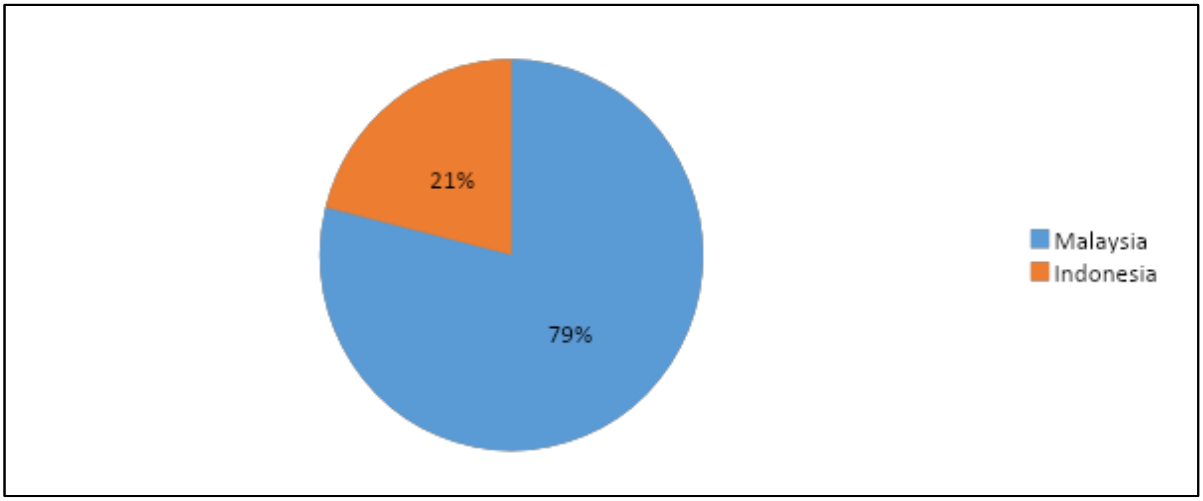


Figure 8. Percentage of studies by country

The findings of this analysis identify the key themes important for policy implementation in TVET education related to SDG4 - accessibility, capacity growth and equity- which are then expanded into sub themes as shown in Table 2. SDG 4 goals related to TVET serves as the basis for the description and identification of the required attributes. Table 2 shows the mapping of the three related SDG4 targets and its sub themes to the identified studies.

Table 2. Mapping of identified studies to SDG targets related to TVET

SDG 4	TARGET 4.3 Accessibility		TARGET 4.4 Capacity growth			TARGET 4.5 Equity	
Authors	Quality	Affordance	Employability skill	Decent jobs	Entrepreneurship	Gender Disparities	Equal Access
Abdullah et al. (2019)	x						
Rajadurai et al. (2018)	x		x				
Dogara et al. (2019)	x		x				
Hassan et al. (2018)	x	x	x				
Winarno et al. (2018)	x		x				
Suartini (2019)	x		x				
Kamaliah et al. (2018)			x			x	
Hashim et al. (2019)	x						

Mohammad et al. (2019)					x	
Ana et al. (2019)	x					
Mustafa et al. (2019)	x					
Abdul Karim & Maat (2019)			x			
Mahazir (2019)			x	x		x
Ismail & Hassan (2019)			x			
Ali et al. (2017)			x		x	
Kamin et al. (2018)	x		x			
Hassan et al. (2019)	x	x				
Ashari et al. (2019)			x			

As an overview, Table 2 suggests that most of the empirical studies identified in the literature search focussed on the examination of the extent TVET programs are able to offer quality programs to all women and men (SDG 4 Target 4.3). As expected issued of employability related TVET program receive equal attention by Malaysian and Indonesian researchers (SDG 4 Target 4.4). SDG4 indicators related to affordances decent jobs, entrepreneurship, gender disparities and equal access, however, are less investigated by researches in Malaysia and Indonesia. Thus, previous review of TVET policies on the five-member states of UNESCO Jakarta is referred in the following discussion.

5.1.1 Accessibility

Referring to SDG 4 the key point of Target 4.3 is to ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university by 2030. Thus, quality and affordance aspects in TVET education are the primary concern.

i. Quality

The consistency of the TVET certification program is determined by the assessor 's expertise as they are responsible for judging proof against the framework norm. Competency Based Assessment (CBA) was commonly used in TVET as a method for determining the competency of individuals to fit the national qualification framework (NQF). In certain member state countries, the assessment quality has been assured; however, there is an inadequate arrangement to ensure that the outcomes (judgment) and qualifications align with those described in NQF.

a. Brunei Darussalam

The Ministry of Education is divided into three agencies that are connected to the quality assurance of TVET in Brunei Darussalam: the Brunei Darussalam National Accreditation Agency (BDNAC), the Brunei Darussalam Technical and Vocational Education Council (BDTVEC) and the Private Education Sector (BPS). The BDNAC is responsible for the assessment and accreditation of qualifications recognised by the Government of Brunei Darussalam. The BDTVEC acts as the national awarding body for technical and vocational qualifications in Brunei. Through this local awarding body, the provision of technical and vocational education in the country has become more flexible and effective.

To measure the success of TVET in Brunei Darussalam, the following three Key Performance Indicators (KPIs) are used as shown in Figure 9.

Employability Rate	Employers' Satisfaction Rate	Students' Completion Rate
the measure of the percentage of graduates being employed 6 months after graduation	the measure of the proportion of employers being satisfied with the work and performance of graduates being hired	the measure of the percentage of students completing their programmes

Figure 9. Key Performance Indicators (KPIs) in Brunei Darussalam

Despite this, private Registered Training Organizations (RTOs) can offer foreign accredited programmes such as BTEC, London Chamber of Commerce and Industry, and National Craft Certificate. Under the Energy Industry Competency Framework (EICF), the Energy and Industry Department at the Prime Minister's Office (EIDPMO), in collaboration with the MoE, has also set up a working group to establish and oversee the Energy Industry Quality Assurance (EIQA) framework. The EIQA framework would manage, monitor, and audit the quality process and standards for RTOs (TVET Brunei, UNESCO 2018).

b. Indonesia

Indonesia places a special focus on the development of Public-Private-Partnerships (PPP) on the national, regional, and international level to enhance the quality of TVET. PPPs between TVET (SMK) and the world of business and industries can take several forms, such as student internship placement, institutional refurbishment support, 'train-the-trainer' programmes, and curriculum design development to ensure delivery of demand-driven TVET programmes. Specifically, development of demand-driven programmes is based on the concept of 'link and match'. This concept highlights the need to make SMK programmes relevant by aligning them with labour market needs.

One of the implementation strategies of link and match is the adoption of a dual education system (Pendidikan Sistem Ganda, PSG) that systematically integrates and synchronizes educational programmes in schools and skills acquisition programmes gained through direct work in the workplace. A common example of PSG in Indonesia is the internship or industrial work practice programme (Prakerin), which involves activities such as synchronisation and curriculum validation, guest teachers from industries and competency tests. There are no formalised public-private-partnerships in Indonesia at the moment, however, as a part of the link and match, each vocational

institution is encouraged to initiate cooperation with industries based on its location and needs (TVET Indonesia, UNESCO 2020a).

As per law, the minimum educational qualification for teachers at secondary vocational schools is either Diploma IV (DIV) or Undergraduate Degree (S1). In other words, to become a qualified TVET teacher, one has to complete a four-year university degree or four years of higher education or Diploma IV from Polytechnics obtaining a teacher certificate, as well as demonstrate professional, pedagogical, personal, and social competencies. Furthermore, prospective teachers need to complete a teaching practicum at a selected school and pass an annual teacher competency-based test.

For teaching at the polytechnic level, the minimum qualification is a master's degree in relevant disciplines. This applies for polytechnics under the Ministry of Research, Technology and Higher Education (MoRTHE), as well as those under the Ministry of Health (MoH). Those who meet the minimum qualifications accompanied with relevant industrial experience generally have more advantages in terms of securing a job and progressing in their professions. Thus, teacher certification is one strategy intended to ensure quality of teachers with competencies that lead to improved quality of TVET education in Indonesia. Teacher certification is an in-service programme for teachers expected to produce better quality of education and it is conducted through the direct provision of the certificate, portfolio assessment, education and training of the teachers (PLPG), and teacher professional education (PPG).

Indonesian vocational education focuses on teaching something that is suitable and effective for society; teaching and learning is instructive and focused on the growth of society's technology, learning material selection has broad perspectives, and students can be convinced of the reality at work. Following the program, further learning progress was developed as a contextual praxis (Suartini 2019). The author defines praxis is the mechanism by which an idea, lecture, or skill is implemented, learned, or understood. She further argues that a new understanding in the curriculum is sought for the expansion of the curriculum concept as a mechanism, with the addition of the need for a shared commitment to agree (among educational authors) on activities that are required (as part of the learning process) to achieve specific goals that have been set by the Kementerian Pendidikan dan Kebudayaan, (2013). The key planning is to define resources and instructional materials before the instructional is introduced. That is because the number of devices doesn't match student statistics. The instructor uses a project-based learning model to solve the problem. Training exercises take the form of assembly skills and installation of the components. The methods made in learning are more interesting and students more easily understand the theories taught, because students can apply the theories given (Suartini, 2019).

TVET 's curriculum places great emphasis on the internship of students as a competitive project, as a realization of being important to industry. Ana et al. (2019) argued that it is imperative that TVET institution connects their graduates to industry needs' and to suit them. Since 1997, Indonesia has introduced a dual system program by implementing the German vocational education system with some changes to Indonesia 's situation (Ana et al., 2019). The role of industry in the education system of schools is important to reduce the difference in the competency of students with respect to demand from industry. Industry shall engage in the creation of curricula as well as in the process of learning and evaluation. TVET institutions in Indonesia continue to face enormous challenges in approaching the industry. As a result, industry assessment of students' competency relevant to their needs is poor (Ana et al., 2019).

The quality and expertise of lecturers therefore play very important roles in deciding the students' quality / skill, the skill competency of teachers who can make learning plans is very influential. Indonesia's national education framework is a quality control of the ISO 9001:2008

certification criteria for the application of learning activities. The passion of educational teachers aims to enhance their professional qualifications individually, in order to train their students to face technical developments. Vocational High School has been certified by ISO 9001:2008 for its quality management and now started to improve the quality of ISO 9001: 2008 to ISO 9001: 2015 (Suartini, 2019).

The teacher-centric approach adopted by most teachers when combined with different styles will increase the interest in learning among students. Nevertheless, vocational education requires student-centered training to meet the minimum competencies laid down in KTSP 2006 and required by Minister Regulation No. 19 of 2008. Curriculum design at Technical High School is adjusted to the available infrastructure. As a result, teachers are only permitted to teach with example, simulation, or students do practice in turn, and the curriculum implementation depends on the skill or styles of the teachers to apply the teaching strategies.

c. Malaysia

The National Vocational Training Council (NVTC) is responsible for quality control, accreditation of training providers and course certification. The NVTC accredits TVET providers to undertake training and assessment in specific skills programmes at different skill levels. Accreditation is granted for the duration of 3 years after which TVET providers are required to apply for the renewal of accreditation within a period of 3 months before the accreditation expires. Re-accreditation is usually extended for another 3 years. The accreditation of training providers is conducted by assessors, and internal and external verifiers. Assessors and internal verifiers are appointed by accredited TVET providers and perform in-house assessment as well as internal verification based on documentation and procedures stipulated by NVTC. External verifiers are officials accredited and appointed by NVTC to ensure full conformity of the assessment and internal verification carried out at accredited TVET institutions.

The Ministry of Education (MoE) is responsible for formal TVET programmes in secondary schools, develops, coordinates TVET policies and the curriculum. The Ministry of Higher Education oversees TVET programmes in public and private universities, polytechnics and community colleges. The Ministry of Youth and Sports provides basic, intermediate and advanced levels of industrial skills training programmes in training centres and the Youth Advanced Skills Training Centre. The Ministry of Human Resources is in charge of industrial training institutes (ITIs) and provides non-formal TVET programmes. In addition, it has an important coordinating role through the National Vocational Training Council (NVTC).

The National Vocational Training Council (NVTC) – under the Ministry of Human Resources – is the national body entrusted with a major role in formulating, promoting and coordinating industrial and vocational training strategy and programmes, including implementing a national skills certification programme. Some of the other main functions of NVTC include the assessment of skills needs; the development of the National Occupational Skills Standards (NOSS); the promotion of skills training and skill-based careers; upgrading the capabilities of training personnel, and conducting study/research on skills training (TVET Malaysia, UNESCO 2019b).

TVET curriculum should concentrate on providing current knowledge among Malaysian technical graduates that industry players feel lacks. As such, Higher Education Institutions (HEIs) are urged to ensure that TVET as part of the curriculum introduces students to the latest issues and challenges. By putting the expectations of managers and evaluations of the performance of their graduates, we can recognize how technical graduates perform, the problematic problems that occur and the areas that need improvement. Hassan et al. (2012) also emphasize the need to improve the

accreditation program skills to allow the new TVET lecturer model to meet high quality standards and teacher market needs.

In addition, a framework needs to be established by defining the qualification requirements for TVET lecturers in accordance with the transformation of the vocational education system in Malaysia. Lecturer's reputation and experience play very important roles in assessing the students' reputation / performance (Hassan et al., 2018). In Malaysia, the competencies of TVET lecturers in terms of their expertise, qualifications and standardized skills have become a concern in this country's teacher training. In 2020, all teachers are supposed to have at least a first-degree qualification before they can enter the teaching profession to ensure that they meet the standards needed before leaving the training institution (Hassan, Razzaly, & Alias, 2012). This statement is in line with and Mahazani (2011), who suggest that the number of literary studies on TVET's competencies is still low, thus the theoretical and empirical competency profiles of TVET lecturers are still unsatisfactory. As stated by Othman and Yaakub (2010) the process of reform and reconstruction of the TVET system has shown that various changes have been made and new paradigms developed. In achieving these goals, there are vital aspects that require urgent action and long-term preparation (PPPM, 2013-2025). One of these essential elements is the recruitment from outside the market of a well-trained lecturer as a teaching staff at vocational college (Abdullah et al., 2019).

Proposed a standard model of competence for TVET lecturers containing technical and common skills and yet an effective instrument for the assessment of competences. The general skills competency requirements can be used as a benchmark for vocational college and the Ministry of Education's technical and vocational education (BPTV) division to improve TVET lecturers' competency level. The findings of the research are in line with the focus of the Malaysia Education Blueprint (PPPM 2013-2025), Which is to reduce the competitiveness gap amongst TVET lecturers. That also applies to the 2016-2020 second wave index of professionalism and standardized skills. The findings also provide BPTV with feedback in the creation of a continuous curriculum for professional development and in professional ethics, temperament, ability, and practice of professional learning communities.

Besides that, the Malaysian government has established polytechnics to provide industry-oriented technical education and training to post-secondary school-leavers to enhance the required competencies of the technicians and technical assistants in various fields. Currently, Malaysian polytechnics offers 10 degrees, nine advanced diplomas, 78 diplomas, 12 pre-diploma programmes and seven (7) special skills certificate programmes. As a higher education institution, polytechnics follow the quality assurance and accreditation standards of the Malaysian Qualification Agency (MQA), which subscribes to the Malaysian Qualification Framework (MQF).

Notwithstanding this, it was found that the relationship between quality of service and loyalty to the students was mediated by satisfaction of the students (Hassan et al., 2019). Based on the findings in this report, there is no doubt that quality of service, student satisfaction and corporate image are very important factors in the loyalty of students in TVET HLIs. The competition among the HLIs is currently very tough and achieving the enrolment goal is very challenging. This study indicates that TVET HLIs boost the standard of service they offer as their key customers to the students. The key explanation is that the standard of service is empirically established as the main factors affecting the satisfaction, corporate image and loyalty of the students. Healthy relationships between staff and students can instil a sense of satisfaction and thus affect the loyalty of the students. In another perspective, TVET HLIs' corporate reputation can be improved by connecting with alumni who work effectively with big corporations. The company's optimistic testimony regarding graduate efficiency would help affect TVET HLI 's improved image and credibility.

d. Philippines

TESDA is the only accreditation and certification body for TVET. It includes two systems that seek to uphold the quality in TVET, namely the Unified TVET Programme Registration and Accreditation System (UTPRAS) and the Philippine TVET Competency Assessment and Certification System (PTCACS). These systems provide a quality management system for programme registration, assessment and certification, and the development of Training Regulations (TRs) as well as Competency Assessment Tools (CATs). UTPRAS provides a quality assurance mechanism through the mandatory registration of TVET programmes with Technical Education and Skills Development Authority (TESDA), which includes regular compliance audits, and the voluntary accreditation of TVET programmes and institutions by an accrediting body. The registration of TVET programmes signifies compliance with the minimum requirement stipulated in the TESDA training regulations.

PTCACS determines whether the graduate or worker can perform to the standards expected in the workplace based on the defined competency standards. Certification is provided to those who meet the competency standards, thereby ensuring the productivity, quality and global competitiveness of middle-level workers. In 2017, TESDA launched the National TVET Trainers Academy (NTTA) to oversee the development of trainers in the Philippines. The Trainer Development Programme is a response to the demand for quality trainers who will manage and implement the TVET system in the Philippines. It will address the need to upgrade the institutional or organizational competencies of technical and vocational institutions (TVIs) as measured by the East Asia Summit TVET Quality Assurance Framework (EAS TVET QAF), the TESDA Star Rating System and the Asia Pacific Accreditation and Certification Commission (APACC). The programme shall enhance the competencies of administrators, supervisors, teaching and non-teaching staff based on the competency standards defined by the Human Resource Management Division – Administrative Services (HRMD-AS) of TESDA and the Philippine TVET Trainers' Qualification Framework (PTTQF) Trainers' Methodology (TM) Level I–IV (TVET Philippines UNESCO 2019c).

ii. Affordance

TVET, as argued, earlier is a mixture of formal, non-formal and lifelong learning education. Thus, government, private sectors, and non-governmental agencies play an important role. Across the member state countries, government agencies are the common platform for TVET. Interestingly, non-governmental agencies play a larger role in TVET provision when the society of member states is more SMI oriented. The offering is also determined by the funds available.

a. Brunei Darussalam

Since the Ministry of Education is the main ministry responsible for TVET, the financing of TVET draws upon the Ministry. Since TVET is part of the National Development Plans, thus it received a received a budget of US$695.8 million for the financial year 2018/19. (TVET Brunei Darussalam, UNESCO 2018).

b. Indonesia

Like other educational services, TVET financing is a joint responsibility between the government through the MoEC which provides 20% of national budget to finance education services, and other education stakeholders, such as local governments (20% regional budget contribution) and communities. Private TVET institutions are independently financed; funding depends on the type of ownership (individual, faith-based, non-governmental organization, and partnership) and requires

operational authorization from the ministry. Private schools may charge fees from students to run the institution (TVET, Indonesia, UNESCO 2020a).

c. Malaysia

TVET is funded by the government, through the Ministry of Education and the Ministry of Human Resources. For example, the Human Resources Development Fund (HRDF) is run by the Human Resources Development Council (HRDC) – under the Ministry of Human Resources. The Fund operates as a levy/grant system which charges employers a set amount and provides training grants in return. TVET students also must pay enrolment and participation fees (TVET Malaysia, UNESCO, 2019b).

Despite this, financial dimension is very relevant depending on the analysis, and is the main deciding factor. UniKL students are very concerned about the sustainability of financial aid, particularly by Majlis Amanah Rakyat (MARA), according to Hassan et al. (2018) in Malaysia. MARA provides students with the financial assistance.

d. Philippines

TVET in the Philippines is being funded through various sources, such as: National Government through the Annual General Appropriations Act (GAA); Industry/Employers; Local government units; Student fees; Contributions/Donations from such as Asian Development Bank (ADB) and World Bank. The GAA sets the general parameters on how funds will be allocated and defines programmes and services for which the funds can be allocated. The utilization of contributions and donations are usually defined by the respective donors. Public TVET programmes are funded through the following agencies: Technical Education and Skills Development Authority (TESDA), which funds a network of TESDA Technology Institutions; Local Government Units (LGU), which fund short-courses in TVET; Department of Interior and Local Government (DILG); Department of Agriculture (DA); and Department of Social Welfare and Development (DSWD).

Funding for private TVET initiatives are derived from the following sources: Fees paid by trainees for their TVET course; Companies which fund apprenticeships, training programmes and offer allowances to trainees; and NGOs which run training courses and provide funding for training institutions. In the Philippines, the authority responsible for TVET at the state level is the Technical Education and Skills Development Authority (Pangasiwaan sa Edukasyong Teknikal at Pagpapaunlad ng Kasanayan, TESDA). All management and supervision of TVET is lodged with it. Moreover, the adoption of the quality-assured TVET System and implementation of the competency-based TVET system are some of the major decisions taken by the agency. Serving at the forefront of Philippines' TVET, TESDA is responsible for both managing as well as supervising the Philippines' Technical Education and Skills Development (TESD) (TVET Philippines, UNESCO 2019c).

e. Timor-Leste

TVET is financed by the state Human Capital Development Fund. It aims to sponsor teachers' professional development and provide scholarships to Timorese students to study abroad. A particular project - Workforce Development Programme Timor-Leste - WDPTL (2014-19), under the Department of Foreign Affairs and Trade (DFAT), offers access to vocational training and placement as a seasonal worker programme in Australia. Among the work skills provided include English language and forklifting training. After the training in Australia, the WDPTL sets up worker's linkages with potential employers or setting-up small businesses. (TVET Timor-Leste, UNESCO 2020b)

5.1.2 Skill Development

The target 4.4 in SDG 4 emphasizes on increasing the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs, and entrepreneurship. These are sub themes identified for the aforementioned category.

i. Employability skill

Employability has become an alarming problem on a global scale particularly as the world moves into the Fourth Industrial Revolution. In TVET, Ismail & Mohammad (2015) proposed that the value skills that any TVET-based program students should possess, is related to the issue of employability. The employability skill can be defined as the ability of an individual to be employed who have the required expertise, knowledge and understanding in the related field (Darce Pool & Sewell, 2007). Employability also describes one's ability to participate, represent and express in incentives ((Abdul Karim & Maat,2019). Consensus in defining employability is still arguable as some scholars have specifically defined the concept and the others have implicitly but one common definition of employability is about obtaining a work (Abdul Karim & Maat,2019).

a. Indonesia

It was found that the standard requirements were not underlined enough in the papers reviewed. Therefore, the mind-set, motivation and awareness of Indonesian students, and problem-solving skills such as innovative thinking and collaboration skills of students, strengthened by Multimedia in the Direct Problem-Based Learning (m-DPBL) approach to computer networks for teaching and learning (Winarmo et al., 2018).

b. Malaysia

Skilled workers are about 28 percent of the total workforce in Malaysia, which is below the comparison level of developed countries with a minimum skilled workforce of 35–40 percent (Department of Skills Development [DSD], 2011a). This is also well below that of certain developing countries like Singapore (49%) and South Korea (36%). The Malaysian government has therefore determined that the skilled workforce must be increased by TVET sector initiatives to a minimum of 35 per cent by 2020 (Economic Planning Unit, 2011). Careers in the skills sector have become critical, in which graduates working outside the TVET area rose from 44.40 percent in 2007 to 48.90 percent in 2008 but dropped to 37.50 percent in 2009. (DSD, 2011b). In addition, a study by the DSD in collaboration with the Skills Development Fund Corporation (SDFC) found that 49.90% of the 399 MSCS graduates funded by the SDFC did not choose a career in any skills sector (DSD, 2011c).

One of the reasons given was that students did not have very good knowledge about the skills or interest in it (Ashari et al., 2019). Based on other local studies, the researchers argued that low participation in the skills sectors is as a result of low interest in TVET professions (Alavi & Awang, 2011, 2013). Other factors why Malaysian graduate find difficulty in choosing a career is due to lack of knowledge of the specific job. It appears the despite the introduction to related career by the institution provider, it was still found to be insufficient. Malaysian Skills Certification System students are often unable to decide their interests and choose a profession. This study shows, in particular, that work adaptability, career skills and career priorities have a significant effect on Malaysian Skills Certification System students' career choice in TVET. This has also found that adaptability is the most important factor in the career choices of the students, followed by job experience and career interest. More research defined job adaptability as the most important aspect, although it needs to enhance its performance.

Several steps have been taken by the Malaysian Government to address the problems of a shortage of local skilled staff. This issue is also one of the big challenges facing Malaysia's technical and vocational education (Abdul Karim & Maat, 2019). Based on the study, Malaysia places more focus on the transformation of employability skills model where the skills proposed can be identified as follows: communication skills, teamwork skills, problem-solving skills, self-management skills, planning and organizational skills, technical skills, learning skills and entrepreneurial skills (Kamaliah et al. 2018). The emphasis on skill acquisition is due to the high unemployment rate among graduates, high crime rate due to untrained young people in advanced technology and a challenging economy (Kamaliah et al., 2018). The graduate attributes examined were knowledge, skills, abilities, and personalities (KSAP).

KSAP is seen as an important instrument for assessing the marketability of graduates. To counter this, the Eleventh Malaysia Plan (2016–2020), the most recent national roadmap, emphasizes the creation of a professional local workforce as one of the six main strategic thrusts that will help the country achieve a positive economic transition from a middle-income country to a high-income one. In this plan, the government has determined that the TVET sector is the main route to providing highly qualified human resources and one of Malaysia's key economic drivers for becoming a high-income nation. TVET seeks to improve national productivity and competitiveness. The demand for labour, particularly for the TVET sector, is expected to rise with the implementation of the National Key Economic Area (NKEA), according to the National Economic Planning Unit (NEPU). NKEA will need up to 3,3 million people by 2020, of which 1,3 million will be TVET graduates (Ismail & Abiddin 2014; Rajadurai et al. 2018).

Furthermore, there is an argument that the current engineering education does not give sufficient emphasis to teamwork, communication, knowledge retention and the ability to synthesize and link courses and fields (Hassan et al. 2018). Employers' views on graduate skills clearly indicate that progress in all areas is essential for engineering programs, particularly in several non-technical aspects of engineering education. In addition to incorporating mathematics and science as core subjects of engineering, engineering curricula will emphasize elements of humanism as opposed to those of technology and process. This holistic curriculum i.e. combining of technical and humanity aspects are to address the concerns often highlighted regarding meeting to the industrial demand that eventually is about the quality and quantity of TVET graduates. (Hassan et al. 2018).

Soft skills such as communication skills, problem-solving skills, teamwork are subsequently interpersonal skills that have become critical to the development of graduates' employability as a result of the rapid changes in workplaces in the 21st century (Dogara et al.,2019; Hassan et al., 2018). Therefore, emphasis is now put on teaching approaches that promote the active participation of students in the teaching-learning cycle to develop expertise in both basic fields of academic training and those known as soft or non-technical competencies. Thus, the development of students' employability through the acquisition of interpersonal skills has continued to fascinate ample attention from diverse stakeholders in the educational sector and the labour market globally (T. N. Dahunsi ,2017). Basically, the findings of this study signified that the application of project-based learning would enhance the development of soft skills among technical students at technical colleges (Dogara et al., 2019).

In addition, Kamaliah et al. (2018) proposed eight dimensions of employability skills : competency to identify, plan, and use resources; competency to work in a team; competency to acquire and use information; competency to understand systems; competency to use technology; basic skills incorporating reading, writing, mathematical operation, listening and speaking; thinking skills incorporating creative thinking, decision making, visualization, learning and reasoning; personal competence which includes accountability, integrity, socializing, self-management and honesty.

In an effort to identify the technical competencies needed to meet the demands of IR4.0, Ismail & Hassan (2019) found initial concerns of industrial players of their needs through a literature review. It was found that polytechnic students were lacking of soft skills and thus need to be taught in the curriculum. The 4Cs i.e. communication skills, collaborative skills, critical thinking skills and creative skills including Internet of Things (IoT) competencies are also in demand by the industries. The lack of these employability skills would result less chance of being employed. Thus, Ismail and Hassan suggest that these skills could be acquired through lifelong learning either supported by the industry through continuous professional development programs. Lifelong learning opportunities are offered by Ministry of Human Resource supported by offering through various scholarships or loans to interested parties.

The industry does not expect that TVET graduates would be equipped with physical skills to operate the machinery and be interested in process mechanics as there is a workforce in place to manage this task. HEIs should therefore move the resources currently channelled to enhance the physical abilities of TVET graduates into the resources required to enhance the ability of TVET graduate's ability to acquire state-of-the-art knowledge. At the micro-environmental stage, based on the complexities of the industry, HEIs will reorganize the delivery of TVET curriculum to ensure that appropriate TVET graduates are produced for industry. Hence, developing a new breed of TVET graduates capable of reacting to the current demands for human resources, which will contribute indirectly to the national economy (Rajadurai et al., 2018).

According to the World Economic Forum (2017), most individuals' dependent on only one skill set or limited experience are unlikely to maintain long-term jobs in the future economy because of rapidly changing employment markets. The industrial revolution, known as the Industrial Revolution 4.0 (IR 4.0), is responsible for those rapid changes. It is the wake-up call for industrial and educational policy to the working world at a time when digital technologies are increasingly shaping the world. Based on an Oxford University research (Ismail and Hassan 2019), it has been argued that developed nations will lose jobs at the rate of 47 % within the next 25 years. Baker in Ismail and Hassan (2019) argue that the job loss is because that in the future a mixture of 'technical skills' and 'soft skills' are essential for the nature of business in the era of IR4.0. that requires innovation and value add offerings.

Thus, Ismail and Hassan (2019) listed the set of technical skills for IR 4.0, including analysis, modelling, programming and use of collaborative robots, use of additive manufacturing technologies, simulation, design and building of digital supply networks, big data management as well as the implementation of IT architectures, platforms and component orientation towards IR 4.0. Clearly, there is a gap in current technical skills as opposed to the criteria for IR 4.0 skills. It is commonly known that to survive in the era IR 4.0, one need to learn and relearn through lifelong learning process and professional development. Malaysia needs to collaborate with all level of stakeholders such as between government, industry and educational institutions to develop the higher education curriculum that is able to enhance the workers' skills and at the same time reduce the skills gaps (Ismail & Hassan, 2019). For other cases, the introduction of the other emerging programming language and IR 4.0 innovations should also be considered for order to ensure that TVET students have a decent chance to get a job after completing their studies. New technical information for their potential skills should be integrated into the digital technology curriculum, in order to satisfy the need for technological change (Hassan et al., 2019).

Here in Malaysia, while the government has adopted a range of measures to reduce the skills gap, the public's negative view of vocational education and training persists. Plans to reduce the capability gap include short-term approaches such as creative training models and medium and long-term approaches such as extensive rethinking of strategic partnerships between training organizations

and industry to provide more flexible workplace delivery (Mustapha et al., 2019). The rapid evolution of information and communication technology has changed the face of TVET, especially when ICT was combined with adequate pedagogical foundations (Hashim et al.,2019).

ii. Decent Jobs

This component based on the related empirical studies (see Table 2) are only discussed in studies by Malaysian researchers. According to Mahazir (2019), there is a large gap due to people's negative view of the industry, such as long working hours, low wages, low profile employment and so on. This gap can be closed by positively enhancing the understanding of the people. That dimension, however, was not much debated. In addition, the results on job interest and knowledge reflect the value of strategy, operational, and managerial implications for fostering youth jobs interest and knowledge (Ashari et al., 2019). They are applicable specifically for the Malaysian Skills Certification System (MSCS). MSCS educators are encourager to play a more significant role. One of the roles is to promote intensively the various work opportunities relate to skills to the students. In addition, the role of educators is to introduce that information and encourage gathering of career details among the students' themselves. This could be done as early as possible and not wait for certain age level to share the work information. It has been argued that students at the age of 14 years old tend to make their decision in the career that they are wishing to pursue.

Ashari et al. (2019) based on their study suggest that career management for TVET students need include more of job adaptability related activities. Such an approach will both ensure TVET graduates to be able to choose their career interest and the same being able to make changes effectively to the career changes due to fast pace changes in the industry.

iii. Entrepreneurship

The entrepreneurship sector provides a great opportunity to embark on a career. Entrepreneurial profession is rising and contributing to economic growth in the region. This field has become a career choice for the younger generation, particularly in developed countries, and is seen as an alternative career in overcoming unemployment problems, particularly among graduates (Fristia & Navastara, 2014; Othman & Ishak, 2011). The TVET policy in Malaysia explicitly highlights the aspect of entrepreneurship, thus the discussion in this section is based on empirical studies that support the policy on entrepreneurship in TVET. A caveat is in order here. TVET policies for Timor-Leste also explicitly highlights the need for entrepreneurship in a TVET program. However, the earlier search on empirical studies on TVET and Timor-Leste fails to identify any related studies thus no discussion on it.

In Malaysia, especially graduates in TVET courses this career is still less favourable. Mohammed et al. (2019) has reviewed the 2014 study of the Global Statistical Entrepreneurship Monitor (GEM). It was found that only 50.37 percent of Malaysians choose entrepreneurship as a career choice. The 2016 study of the Global Statistics Entrepreneurship Monitor (GEM) also found that Malaysia remained one of the lowest countries in choosing entrepreneurship as an optional career which is 44.10 percent compared to the countries with the highest and medium scores Indonesia (69%), China (70.3%) and Thailand (77.7%). These statistical results clearly show that Malaysians' interest and desire in entrepreneurship as a career option is declining (Mohammad et al., 2019). The Entrepreneurial Action Plan (Higher Education Institution) 2016-2020 is also being introduced to promote entrepreneurship in order to meet the country 's ambitions and expectations in producing graduate entrepreneurs. Mohammad et al. (2019) argue that one of the reasons Malaysians do not

opt entrepreneurship as a career due to lack of interest toward self-employment and has lack of confidence of how to be competitive. Most students at TVET do not see entrepreneurship as a career choice. Therefore, a formal and comprehensive entrepreneurship program at Malaysia's higher education institutions (HEIs) provided students with opportunities to generate income while studying and improve their level of employability. In line with the first shift of Malaysia Education Blueprint 2015 - 2025 (Higher Education), the Ministry of Higher Education (MOHE) has developed the Higher Education Entrepreneurial Action Plan 2016-2020 to cultivate creative minds in the higher education system with a view to developing a dynamic, creative, and sustainable work creator career.

However, this initiative also aims at ensuring the sustainability of financial institutions by acting more entrepreneurially towards funding sources for higher education to reduce reliance on government resources (Higher Education Institution Entrepreneur Action Plan 2016-2020). On 13 April 2010 the Ministry of Higher Education (MOHE) also launched the Higher Education Institutions' Entrepreneurship Development Policy to encourage and improve the growth and education of entrepreneurship in higher education institutions (HEIs) in a more structured and comprehensive way. Entrepreneurship Development policy for institutions of higher education is composed of: (i) Producing quality human beings and having entrepreneurial thoughts, attributes and values; (ii) Increase the number of graduates of Higher Education Institutions who enter into entrepreneurship as a career; and (iii) Develop academic, researcher and administrators of entrepreneurial Institutions of Higher Learning with an entrepreneurial mind.

Similarly, recognizing the importance of entrepreneurial education among students, Malaysia's Ministry of Education's Polytechnic Education Department has made entrepreneurship an elective subject for Club / Society (DRK3002) and Entrepreneurship (DPB2012 / DPB 2012) as a polytechnic course in Malaysia compulsory. Digital Entrepreneurship is a newly developed, mandatory course, newly introduced in 2015 to students of all study programs. This course inculcates experiential lessons in which students are asked to operate an online business throughout the course period of 13 weeks by implementing contents of the course. This course was launched in order to prepare students with the skills to use digital platforms in business conduct. It also offers the knowledge and skills required to gives access to become digital entrepreneurs where students are exposed to various online media, social media and other platforms used by digital entrepreneurs nowadays. This is aligned with Phase 2 of the National Strategic Plan for Higher Education 2011-2015 that focuses on initiatives to make entrepreneurial education the mainstream. This initiative is to increase entrepreneurial ability among all students who will contribute to economic development of the country. This program also gave university, polytechnic and community exposure and instilled entrepreneurial values and skills in college students. It encompasses aspects of leadership, innovation, creativity, competitiveness, independence, ability to take calculated risk, ability to identify and create opportunities (Ali et al., 2017).

Efforts to inculcate entrepreneurial principles and elements in teaching and learning need smooth consolidation and new cultural work transition, as each higher education institution, university, polytechnic and community college has its own vision, mission and objectives, as well as differences in teaching culture, norms and practices and focus on study and certainty (Mohammad et al., 2019). However, these entrepreneurship programs are often offered as co-curricular activities, thus require students to balance academic and business activities. The lack of a framework for inculcating entrepreneurial elements explicitly in the curriculum also makes it difficult for the elements to be taught and acquired effectively (Mohammad et al., 2019).

Accordingly, the spiritual dimension will enable the students or individuals to face the challenges and obstacles that come before any excellence can be achieved, especially in purifying the MOHE 's wishes in producing the holistic and entrepreneurial graduates. The spirituality aspect plays

an important role in enhancing students' desire to become graduate entrepreneurs, amongst TVET students (Mohammad et al., 2019).

Moreover, use of Facebook could help to link the period between the classroom and entrepreneurial practice as users continue to interact with the page after they have completed the course and are encouraged into entrepreneurship (Ali et al., 2017). Educators should further evaluate the use of Facebook as a method for enhancing student participation in online course content discussion, evaluating the benefits and weaknesses of combining coursework with social networking. The students of Polytechnics have well received the use of Facebook as an educational technology tool for an entrepreneurship course.

5.1.3 Equality

Referring to SDG 4, the main concern of Target 4.5 is to eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations by 2030.

i. Gender Disparities

It was noteworthy that gender differences among the member states were beginning to put emphasis on TVET. When planning skills learning courses, gender gaps must be placed into context so that specific needs are specifically addressed (Mahazir, 2019). Corrective steps in this regard should be taken to build a balance in the distribution of gender-skills. The equilibrium systems in the acquisition of skills should move towards stability and open in the employment market to fair competition between genders. For example, the hospitality and tourism industry are just an industry requiring equal workforce of men and women (Mohammad et al.,2019). Some hotel departments cannot be imagined running without females, such as housekeeping, front office and vice versa. Yet, conflicting facts are mentioned. The workplace distribution of men and women is unfair.

In Malaysia, it is believed that more female learners than male students are involved in e-learning. Mohammad and Alsaleh (2013) in their analysis of motivational factors found that two significant factors for female motivation were work prospects and *Modern Major* means that female students are more motivated than male students to pursue Hospitality and Tourism courses. It helps raise awareness among both male and female youth about the industry's plenty of job opportunities and encourages them to choose hospitality as a career to fulfil the industry's man-force requirement. The reasons for this disparity between two sexes and the different factors that shape negative perceptions can be identified and thus changed by the policy makers (Mohammad et al.,2019).

Timor-Leste has given attention to this important agenda by ensuring that the country's Strategic Development Plan (SDP) address the gender-related issues. One way of addressing the gender disparity is to understand the experiences of rural women and young mothers and their contribution towards the social and economic development. Policy development based on such evidence would lead to a more effective and relevant TVET policy addressing the gender disparities. Regularly monitoring and assessment on achievement of gender equality is part of the policy (Gardner, 2018).

ii. Equal Access

This sub-theme was not discussed by the studies identified of the related countries, and thus necessarily a gap to be discussed by the researchers in future. Thus, it was considered that further studies should be conducted to examine equal access in TVET. Interestingly, the TVET profile of the Five Cluster Countries, does not explicitly accommodate the equity issue, namely related to equal access of various groups in the policies. Nevertheless, the voluntary monitoring of SDG 4 achievement by the cluster countries may provide the gap that exists in terms of equity and how such data informs the challenges faced in developing and implementing TVET policies for sustainable and equitable economic growth of the country. In a baseline report, by Indonesia MoEC and the United Nations Children's Fund (2017), it was found that a majority of adolescents with disabilities are not captured in the various administrative database- demographic and social welfare data. The absence of basic data may advise the policy directions in TVET. Perhaps, the non and informal TVET training could be further supported and empowered as this is the platform that such group will be able to access.

In the current pandemic COVID-19, equal access to education is greatly affected not only for the general education but also on participation in TVET. Issue notes no 5.2 by UNESCO (2020c), highlighted immediate impact on the accessibility, skills development and inclusivity related to the TVET policies and implementation. The closure of TVET institutions for weeks and months may affect the learning outcomes and eventually lead to dropouts. Based on a recent COVID-19 education response webinar (UNESCO 2020d), the cancellation of examination would affect certification and qualification of the students that eventually will affect their access to the labour market.

UNESCO issue note no 5.2 has highlighted possible response of TVET system to the COVID-19 pandemic in terms of the realigning and delivery of the curriculum and capacity building which include the need to:

- Develop country's own distance learning modality for TVET (online and offline).
- Enhance and support educators and instructors to adapt to distance TEVT mode of learning and teaching.
- Provide provision of teaching materials and equipment to enable the continuation of practical aspect of TVET.
- Develop curricula, teacher training, quality assurance, assessment and certification for distance TVET.
- Ensure equity in TVET enrolment especially among the most vulnerable students and disadvantaged groups throughout the pandemic and more so after it has over.
- Plan for remedial classes that would include among others term based rather than semester based, formative assessment versus summative assessment and longer practical time to cover the loss learning and practical time.

The impact of COVID-19 has alerted policy makers, educators, parents and children themselves to be flexible in providing, delivering and accepting the new form and norm of education. An immediate response pandemic COVID-19 to TVET system is to invest on the concept of entrepreneurship, programs, strategies, and activities in the policy. The concept of entrepreneurship has been required in SDG 4 in relation to TVET and the concept has been adopted in TVET policies in Malaysia and Timor-Leste. The impact of pandemic has also informed that TVET policies should have emergency measures in addressing unexpected events.

5.2 Empirical Findings

For this section, the analysis for the Likert scale items and open-ended responses were performed for member states that responded to the questionnaire. Analysis is based on country and SDG4 targets for TVET namely: i) Accessibility and its subthemes- Quality and Affordance; ii) Skills Development with subthemes of Employability Skill, Decent Jobs and Entrepreneurship and c) Equality with subthemes of Gender Disparities and Equal Access.

5.2.1 Brunei Darussalam

i. Demographic profile

A total of 25 respondents answered the questionnaire, with equal percentage of female (52%) and male (48%) responding to it. A high percentage of the respondents (48%) has a higher national diploma qualification. In terms of working experiences, majority of them are experienced educators with 44% between 6-10 years and 52% with more than 10 years. All the respondents are experts in the TVET.

Table 3. Demographic Profile- Brunei Darussalam

	Profile	N	%
A	**Gender**		
	Male	13	52.0
	Female	12	48.0
B	**Education Level**		
	Bachelor's Degree	29	37.7
	Diploma	7	9.1
	Higher National Diploma	37	48.0
	Master's Degree	3	3.9
	Ph.D	1	1.3
C	**Years of Experience**		
	Less than 5 years	1	4.0
	6-10 years	11	44.0
	More than 10 years	13	52.0
D	**Expertise**		
	Technical, Vocational and Education Training (TVET	25	100.0

ii. Accessibility

a. Skill Development

This SDG4 target is measured based on the following subthemes employability, decent jobs, and entrepreneurship. Table 4 displays the respondents views of the extent to which the targets are met.

Table 4. Percentages of Responses (Employability skills, Decent Jobs and Entrepreneurial)

No.	Item	SDA	DA	A	SA	U
1.	TVET graduates are able to compete locally	0.0	8.0	44.0	44.0	4.0
2.	TVET graduates in TVET are able to compete regionally and globally	0.00	32.0	36.0	12.0	20.0
3.	TVET graduates able to get a job easily after completing their study	16.0	20.0	40.0	8.0	16.0
4.	The salary for TVET graduates is commensurable to the job.	20.0	32.0	24.0	8.0	16.0
5.	Entrepreneurial skills are exposed in TVET courses.	0.0	8.0	52.0	36.0	0.0

In terms of employability 88% agree that TVET graduates are able to be employed locally. But level agreement among the respondents related to be employed at the global level, varies with about 30% does not agree and 20% of them is unsure. Only about 48% agree that TVET graduates can complete globally. The view of graduates is able to get a job after graduating from TVET program varies from 16% of the respondents totally disagree to the statement to another 16% of them unsure of the employability rate among TVET graduates. Again, the respondents are more on the disagreement side as to whether there are enough jobs for TVET graduates (20% strongly disagree to 24% agree). In terms of entrepreneurship, about 87% of the respondents agree that entrepreneurial skills are introduced in TVET courses.

b. Equality

This target aims to eliminate gender disparities in education and to ensure equal access to all levels of education for the diverse and marginalise population. There are two subthemes to this target: a. Gender Disparities and b. Equal Access. Table 5 shows the responses to both subthemes.

Table 5. Percentages of responses (Gender Disparities and Equal Access)

No.	Item	SDA	DA	A	SA	U
	Gender Disparities					
1.	The number of men and women participating in TVET is equal	0	20.0	24.0	36.0	20.0
2.	The TVET courses offered are equally appealing to men and women	0	12.0	52.0	32.0	4.0
3.	Most of the courses offered in TVET are suitable only for men	28.0	56.0	4.0	12.0	0.0
	Equal Access					
4.	TVET offered for persons with disabilities	12.0	36.0	24.0	8.0	20.0
5.	TVET offered for indigenous people	4.0	0.0	40.0	48.0	8.0
6.	TVET offered for children in a vulnerable situation	0.0	8.0	32.0	16.0	44.0

7.	TVET in my country promotes drop-out to participate	0.0	8.0	40.0	44.0	8.0
8.	Scholarships offered to promote people to participate in TVET	0.0	8.0	52.0	36.0	4.0
9.	Capacity to extend TVET to higher education is available	0.0	28.0	16.0	40.0	16.0
10.	Capacity to extend TVET as lifelong learning is available	0.0	12.0	40.0	40.0	8.0
13.	Initiative to promote internship of TVET graduates by partnerships with the private sector	0.0	8.0	36.0	52.0	4.0
14	TVET offered for both youth and adult.	0.0	8.0	48.0	44.0	0.0

About 84% of the respondents agree and strongly agree that the courses offered are equal to women, and do not slant to men or women exclusively (about 84%). However, the respondents vary in their opinion (from 20 % to disagree to 20% undecided) that the enrolment of men and women is equal in TVET. Equal access to TVET program is a critical indicator in SDG4. Among the vulnerable and marginalized community, it appears that 48% of the respondents (strongly disagree and disagree) that the TVET program in Brunei Darussalam did not offer to persons with disabilities. About 50 % to 80 % (agree and strongly agree) that other marginalized community such as the indigenous people, dropouts and those in vulnerable situation is given equal access to TVET program. According to the view of the respondents, opportunities for lifelong learning either related to availability of scholarship and access to higher education is positively supported (about 80% and beyond) by the TVET program in Brunei Darussalam.

5.2.2 Malaysia

i. Demographic profile

A total of 39 respondents answered the questionnaire comprised of 56.4 % are female and 43.6% is male respondents (see Table 6). Percentage of female is higher than male educators reflect the teaching profession in Malaysia, in which females dominate the profession. About 87.2 % of the respondents has a bachelor's degree- that reflects the policy of Malaysian government to ensure all secondary school teachers to hold an undergraduate degree. In terms of expertise about 56% of them is in the TVET field, while about 44% of the respondents are in other fields such as secondary education, primary education and teacher policy and plan.

Table 6. Demographic profile - Malaysia.

No.	Profile	n	%
	Gender		
	Male	17	43.6
	Female	22	56.4
	Education Level		
	Bachelor's Degree	34	87.2
	Master's Degree	3	7.7
	Ph.D.	2	5.1

Years of Experience		
6-10 years	2	5.1
Less than 5 years	1	2.6
More than 10 years	36	92.3
Expertise		
Early Childhood Education	1	2.6
Others	3	7.7
Primary Education	1	2.6
Secondary Education	9	23.1
Teacher Policy and Plan	3	7.7
Technical, Vocational and Education Training (TVET	22	56.4

i. Accessibility

a. Quality

Three items were asked regarding the quality of TVET programs and the items are shown in Table 7.

Table 7. Percentages of responses (Quality)

No.	Item	SDA	DA	A	SA	U
1.	Monitoring agencies play an effective role in keeping up TVET institutions with the standards.	2.6	5.1	66.7	25.6	0.0
2.	Achievement in TVET in my country is recognized internationally.	0.0	5.1	66.7	15.4	12.8
3.	Courses offered are relevant in the 21st century.	0.0	2.6	53.8	35.9	7.7

In terms of quality of the program- more than 80% of the Malaysian respondents indicate high agreement that monitoring agencies are playing their role in ensuring TVET institutions are at a particular standard and TVET program in Malaysia is internationally recognized. More than 90% of the opinion that the courses offered are relevant in the 21st century.

About 60% to 90% of the respondents perceived that the TVET facilities are friendly towards people with disabilities (Table 8). This excellent provision of facilities that is inclusive and safe is seen as able to promote effective learning (90% of respondents indicate high level of agreement). Nevertheless, more than 50% of the respondents reported that facilities need to be upgraded, as the facilities are obsolete. A high percentage (72%) strongly agree and agree that sufficient fund is allocated to TVET.

Table 8. Percentages of Responses (Facilities)

No.	Item	SDA	DA	A	SA	U
1.	TVET facilities is sensitive to participant with disabilities.	0.0	25.6	53.8	15.4	5.1
2.	TVET facilities is sensitive to gender.	0.0	23.1	51.3	20.5	5.1
3.	TVET facilities is safe.	0.0	5.1	66.7	28.2	0.0
4.	TVET environment is inclusive	0.0	0.0	74.4	23.1	2.6
5.	TVET facilities promote effective learning.	0.0	0.0	74.4	23.1	2.6
6.	TVET facilities is upgraded from time to time	2.6	12.8	59.0	20.5	5.1
7.	TVET facilities is adequate	5.1	10.3	71.8	12.8	0.0
8.	TVET facilities mostly obsolete	7.7	12.8	66.7	12.8	0.0
9.	TVET facilities is relevant to current education needs	0.0	5.1	71.8	23.1	0.0
10.	Allocation of fund on education facilities is sufficient	2.6	20.5	64.1	10.3	2.6

b. Affordance

This component of program quality refers to ensuring TVET is accessible to all. Table 9 describes the responses of the respondents to the items related to affordance.

Table 9. Percentages of Responses (Affordance)

No.	Item	SDA	DA	A	SA	U
1.	TVET courses are affordable	2.6	5.1	64.1	25.6	2.6
2.	Government spend sufficient budget on TVET.	2.6	5.1	61.5	28.2	2.6
3.	Government spend ample budget to assist participants that cannot afford to participate in TVET	0.0	12.8	59.0	23.1	5.1
4.	The number of TVET institution is adequate	2.6	17.9	69.2	2.6	7.7
5.	TVET institutions are accessible in every district	0.0	15.4	56.4	28.2	0.0
6.	People are aware of the courses offered in TVET.	0.0	12.8	66.7	17.9	2.6

About 80% of the participants agree that TVET courses are affordable. At the same time more than 80% strongly agree and agree that government of Malaysia provide sufficient budget to assist those who cannot afford to take TVET courses. Another initiative to make TVET courses available for ALL is the number of TVET institutions made available. About 70% agree and strongly agree that there is enough number of TVET institutions in the country and are made accessible in every district. Finally, more that 80 % agree and strongly agree that people are aware of the courses offered in TVET.

ii. Skill Development

This SDG4 target is measured based on the following subthemes employability, decent jobs, and entrepreneurship, and percentages of respondents are in Table 10.

Table 10. Percentages of responses (Employability skills, Decent Jobs and Entrepreneurship)

No.	Item	SDA	DA	A	SA	U
1.	TVET graduates are able to compete locally	0.0	0.0	64.1	28.2	7.7
2.	TVET graduates in TVET are able to compete regionally and globally	0.0	2.6	66.7	17.9	12.8
3.	TVET graduates able to get a job easily after completing their study	0.0	5.1	61.5	30.8	2.6
4.	The salary for TVET graduates is commensurable to the job.	0.0	12.8	64.1	12.8	10.3
5.	Entrepreneurial skills are exposed in TVET courses.	0.0	2.6	64.1	28.2	5.1

In terms of employability about 90% agree that TVET graduates are able to be employed locally. In addition, more than 90% agree that graduates are able to be employed at the global level. More than 80 percent of the Malaysian respondents of the opinion that TVET graduates are able to secure a job easily after completing the program and the salary provided is aligned with the qualifications. In terms of entrepreneurship, about 89% of the respondents agree that entrepreneurial skills are introduced in TVET courses.

ii. Equality

This target aims to eliminate gender disparities in education and to ensure equal access to all levels of education for the diverse and marginalise population. There are two subthemes to this target: a. Gender Disparities and b. Equal Access. Table 11 shows the responses to both subthemes.

Table 11. Percentage of Responses (Gender Disparities and Equal Access)

No.	Item	SDA	DA	A	SA	U
	Gender Disparities					
1.	The number of men and women participating in TVET is equal	10.3	38.5	38.5	12.8	0.0
2.	The TVET courses offered are equally appealing to men and women	0.0	12.8	61.5	25.6	0.0
3.	Most of the courses offered in TVET are suitable only for men	12.8	41.0	35.9	10.3	0.0
	Equal Access					
4.	TVET offered for persons with disabilities	0.0	7.7	64.1	23.1	5.1
5.	TVET offered for indigenous people	0.0	10.3	66.7	17.9	5.1

6.	TVET offered for children in a vulnerable situation	2.6	17.9	56.4	15.4	7.7
7.	TVET in my country promotes drop-out to participate	0.0	12.8	66.7	17.9	2.6
8.	Scholarships offered to promote people to participate in TVET	0.0	10.3	66.7	15.4	7.7
9.	Capacity to extend TVET to higher education is available	0.0	0.0	64.1	28.2	7.7
10.	Capacity to extend TVET as lifelong learning is available	0.0	7.7	51.3	35.9	5.1
11.	Initiative to promote internship of TVET graduates by partnerships with the private sector	0.0	5.1	66.7	23.1	5.1
12	TVET offered for both youth and adult.	0.0	5.1	71.8	17.9	5.1

About 80% of the respondents agree and strongly agree that the courses offered are equally appealing to men and women, and do not slant to men or women exclusively (about 50%). However, the respondents vary in their opinion (from 10 % strongly disagree to 12.8 % strongly agree) that the number of men and women is participating is equal in TVET.

Equal access to TVET program is a critical indicator in SDG4. Among the vulnerable and marginalized community, it appears that 80% of the respondents (strongly agree and agree) that the TVET program in Malaysia is offered to persons with disabilities and to other marginalized community such as the indigenous people, drop outs including to both youth and adult. Those in vulnerable situation is also given equal access to TVET program. According to the view of the respondents, opportunities for lifelong learning either related to availability of scholarship and access to higher education is positively supported (about 80% and beyond) by the TVET program in Malaysia

5.2.3 Philippines

i. Demographic profile

Due to unforeseen reasons, only three respondents from the Philippines responded to the survey. Two of them are male and the other is a female. Their basic educational level is a bachelor's degree and two of them have a Master degree. They are secondary education experts (Table 12).

Table 12. Demographic profile (Philippines)

No.	Profile	n	%
	Gender		
	Male	2	66.7
	Female	1	33.3
	Education Level		
	Bachelor's Degree	1	33.3
	Master's Degree	2	66.7
	Years of Experience		
	More than 10 years	3	100.0

	Expertise		
	Primary Education	1	33.3
	Secondary Education	2	66.7

ii. Accessibility

a. Quality

In terms of quality of the program- 66.7 % strongly agree that the monitoring agencies is effective in ensuring the TVET program is set up to the highest standard. However, the respondents varied in terms of whether the TVET program has reached at the international level (from 33.0% disagree to 33.3% agree to the statement) (Table 13).

Table 13. Percentages of Responses (Quality)

No.	Item	SDA	DA	A	SA	U
1.	Monitoring agencies play an effective role in keeping up TVET institutions with the standards.	0.0	33	0	66.7	0
2.	Achievement in TVET in my country is recognized internationally.	0.0	33	33	33	0.0

Quality of a TVET program also relies heavily on the facilities as it will promote effective learning in a safe learning environment. Table 14 shows the distribution of respondents' percentages to this aspect of program quality.

Table 14. Percentages of Responses (Facilities)

No.	Item	SDA	DA	A	SA	U
1.	TVET facilities is sensitive to participant with disabilities.	0.0	33.3	33.3	33.3	0.0
2.	TVET facilities is sensitive to gender.	0.0	33.3	33.3	33.3	0.0
3.	TVET facilities is safe.	0.0	33.3	33.3	33.3	0.0
4.	TVET environment is inclusive	0.0	33.3	33.3	33.3	0.0
5.	TVET facilities promote effective learning.	0.0	33.3	33.3	33.3	0.0
6.	TVET facilities is upgraded from time to time	0.0	33.3	33.3	33.3	0.0
7.	TVET facilities is adequate	0.0	33.3	33.3	33.3	0.0
8.	TVET facilities mostly obsolete	0.0	33.3	33.3	33.3	0.0
9.	TVET facilities is relevant to current education needs	0.0	33.3	33.3	33.3	0.0
10.	Allocation of fund on education facilities is sufficient.	0.0	66.7	0.0	33.3	0.0

Respondents vary in terms of agreement (33% disagree to 33.3% agree) as to whether TVET facilities are friendly towards people with disabilities, or gender friendly. Again, the view whether TVET environment promotes effective learning or adequate is also varied in terms of level of agreement. It is interesting to note that allocation of fund is insufficient from the perspectives of the respondents (66.7%).

b. Affordance

This component of program quality refers to ensuring TVET is accessible to all. Table 15 describes the responses of the respondents to the items related to affordance.

Table 15. Percentages of Responses (Affordance)

No.	Item	SDA	DA	A	SA	U
1.	TVET courses are affordable	0.0	0.0	66.7	33.3	0.0
2.	Government spend sufficient budget on TVET.	0.0	33.3	0.0	33.3	33.3
3.	Government spend ample budget to assist participants that cannot afford to participate in TVET	0.0	33.3	0.0	33.3	33.3
4.	The number of TVET institution is adequate	33.3	0.0	33.3	33.3	0.0
5.	TVET institutions are accessible in every district	0.0	33.3	33.3	33.3	0.0
6.	People are aware of the courses offered in TVET.	33.3	33.3	0.0	33.3	0.0

All the respondents agree that TVET courses are affordable. In terms of provision of budget, again there is a variety of opinion- in which some see it insufficient (33.3%), some agree it is enough (33.3%) and some is unsure (33.3%) about it. About 70% % agree and strongly agree that there is enough number of TVET institution in the country but are note made accessible in every district. Finally, 66.7% strongly disagree and disagree that people are unaware of the courses offered in TVET.

iii. Skill Development

This SDG4 target is measured based on the following subthemes a) Employability, b) Decent Jobs and c) Entrepreneurship. In terms of employability, all the respondents agree that TVET graduates are able to be employed locally. Employment at the regionally and global levels appear to be disagreement among the respondents, with 33.3% disagree and another 66.6% agreeing to the statement (Table 16). In addition, more than 90% agree that graduates can be employed at the global level. More than 67% of the Philippines respondents of the opinion that TVET graduates can secure a job easily after completing the program. However, only 667% agree that the salary provided is aligned with the qualifications. In terms of entrepreneurship, only 66.6% of the respondents agree that entrepreneurial skills are introduced in TVET courses.

Table 16. Percentages of responses (Employability skills, Decent Job and Entrepreneurial)

No.	Item	SDA	DA	A	SA	U
1.	TVET graduates are able to compete locally	0.0	0.0	66.7	33.3	0.0
2.	TVET graduates in TVET are able to compete regionally and globally	0.0	33.3	33.3	33.3	0.0
3.	TVET graduates able to get a job easily after completing their study	0.0	33.3	0.0	66.7	0.0
4.	The salary for TVET graduates is commensurable to the job.	0.0	33.3	33.3	33.3	0.0
5.	Entrepreneurial skills are exposed in TVET courses.	0.0	33.3	33.3	33.3	0.0

iv. Equality

This target aims to eliminate gender disparities in education and to ensure equal access to all levels of education for the diverse and marginalise population. There are two subthemes to this target: a). Gender Disparities and b). Equal Access. Table 17 shows the responses to both subthemes.

Table 17. Percentage of Responses (Gender Disparities and Equal Access)

No.	Item	SDA	DA	A	SA	U
	Gender Disparities					
1.	The number of men and women participating in TVET is equal	0.0	33.3	0.0	33.3	33.3
2.	The TVET courses offered are equally appealing to men and women	0.0	33.3	33.3	33.3	0.0
3.	Most of the courses offered in TVET are suitable only for men	0.0	33.3	0.0	66.7	0.0
	Equal Access					
4.	TVET offered for persons with disabilities	0.0	33.3	33.3	33.3	0.0
5.	TVET offered for indigenous people	0.0	33.3	33.3	33.3	0.0
6.	TVET offered for children in a vulnerable situation	0.0	33.3	33.3	33.3	0.0
7.	TVET in my country promotes drop-out to participate	0.0	33.3	33.3	33.3	0.0
8.	Scholarships offered to promote people to participate in TVET	0.0	33.3	0.0	33.3	33.3
9.	Capacity to extend TVET to higher education is available	0.0	33.3	0.0	33.3	33.3
10.	Capacity to extend TVET as lifelong learning is available	0.0	33.3	33.3	33.3	0.0
11.	Initiative to promote internship of TVET graduates by partnerships with the private sector	0.0	33.3	33.3	33.3	0.0
12	TVET offered for both youth and adult.	0.0	0.0	66.7	33.3	0.0

In terms of gender disparities, it appears the courses offered are equally appealing to both gender (66.7%). However, it appears that TVET participation appears to be not equal as perceived by the respondents, in which 66.6% of the Philippines respondents find the TVET courses suitable for men. Equal access to TVET program is a critical indicator in SDG4. Among the vulnerable and marginalized community, it appears that 66.6 % of the respondents (strongly agree and agree) that the TVET program in Philippines is offered to persons with disabilities and to other marginalized community such as the indigenous people, dropouts including to both youth and adult. Those in vulnerable situation is also given equal access to TVET program. According to the view of the respondents, opportunities for lifelong learning either related to availability of scholarship and access to higher education is positively supported (about 66.6%) by the TVET program in Philippines.

5.3 Challenges in TVET implementation

Figure 10 summarizes the constraints and challenges faced by the Brunei Darussalam, Indonesia, Malaysia and Philippines in implementing TVET education - as inferred from the empirical studies and the country's documentation on TVET policies. These challenges are being identified by each Member States themselves through the examination of UNESCO TVET Profiles of each country.

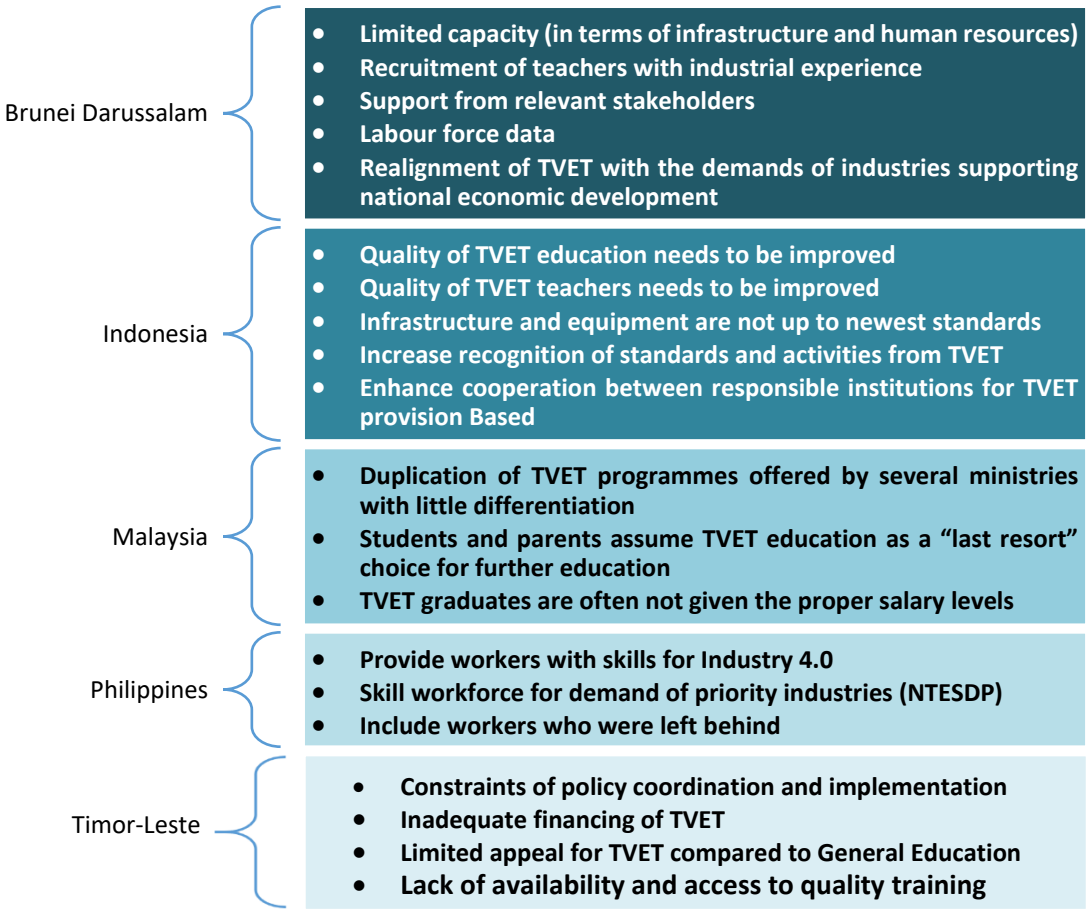


Figure 10. Challenges implementing TVET

Such reflection or mid-term have brought about interventions to realign the plan and its targets. Among the interventions implemented distilled from the empirical studies and UNESCO reports are:

a. Malaysia views in addition to knowledge and technical skills to be acquired by TEVT graduates, they also need to acquire soft skills (e.g., communication skills and teamwork skills; and personalities) for employment beyond the traditional employment related to Technical and Vocational Training. Thus, in addition to the 11thMP, Malaysia has developed a recent policy on the creation of a professional local workforce as part of TVET.
b. The Entrepreneurship Action Plan was part of the higher education plan for Malaysia. Entrepreneurship activities are introduced seamlessly from secondary education to higher education in the forms of co-curricular activities. In addition, social media such as Facebook is leveraged to conduct entrepreneurship activities. It is important to note that entrepreneurship is introduced in the Higher Education policies and plan for 2015-2025. Indirectly, target 4.4 of SDG 4 is accelerated from such a policy.
c. Even though, corrective steps to balance in the distribution of employment so that fair competition is established between genders in the TVET policies and plan, but there are conflicting evidences at the implementation stage. At workplace, through limited empirical studies, it was found that the distribution of men and women is unfair.

The challenges of implementing TVET to meet the SDG4 targets across the member states showed commonalities and to some extend unique to individual countries.

5.3.1 Common Challenges

Common challenges revolve around mainly on lack of infrastructure, equipment and quality programs and instructors. TVET education as a whole and TVET career has been shown to be the last career for students. Skills identified for industry 4.0 have not been addressed by the TVET programs to ensure capacity growth of youths meeting the needs of the industry. These common challenges found from the systematic literature review are also expressed by the respondents gained from the responses to the open-ended questions in the questionnaire.

Here are some of the excerpts from the open-ended responses pertaining to common challenges faced by TVET programs in member countries. The challenges appear to focus on two of the three targets of TVET in SDG 4. The two targets are Target 4.3 and 4.4 focus on providing accessibility and capacity growth of youths in terms of skills to gain employability.

> *Quality of a TVET program is sub-divided into the following indicators a) standards of the program, b) TVET facilities and c) Budget allocation. One person responded the difficulty of getting the TVET program the Malaysian Qualification Agency (MQA) accreditation. Another related reason to the issue of quality of the program is lack of competent TVET educators. In terms of students' ability and motivation, since TVET is seen as a second-class education, instructors faced students who are challenged to give attention to their studies. In addition, passion, and motivation of students towards the program is also challenging. Lack of budget is also a repetitive issue highlighted by the respondents. Budget is required both to support the maintenance cost of the high technology-based equipment and to implement the demands of the new TVET syllabus. (responses from Malaysia)*

> *Aligning the certification to the international standard. Keeping up with industry demand and expectations. Keeping up with other regional TVET institutions. Certification accreditation of HNTEC is not recognised globally, equipment not able to cope with the ever-changing technology. If construction of TVET or Vocational schools are unallowed, then it is recommended that to add more TVET classes in schools. Thus, it is recommended to create an effective technical subject even at the primary level. Providing effective infrastructure (soft and hardware) it is sought after by the respondents. Some of the infrastructure deem necessary is to have space and appropriate location suitable to conduct TVET programs. Such a program needs to be supported with high technology and budget allocation should*

be commensurated with the curriculum reform as well as for maintenance of equipment. (responses from Brunei Darussalam)

The challenges faced by TVET program revolve around lack of support from the government in terms of funding and dissemination campaign. In terms of how Philippines responds to the impact of COVID-19 on TVET delivery, the responses were like any other sectors are doing whereby education is delivered through online. (responses from Philippines)

The systematic literature review found that there was less concern on ensuring reducing gender disparities and providing opportunities to the diverse needs of the community. The responses from the Likert scale items confirmed that TVET facilities for disables and gender-friendly should be enhanced. While courses are developed to be equally appealing to both genders, but the survey findings showed that men are participating more in TVET compared to the women.

So far, non-formal and in formal TVET systems, caters the needs of marginalised groups. While non and informal TVET system complements the formal TVET system, often the financing of such programmes is from private organizations or NGO that might not be sustainable. Hence, a holistic and comprehensive TVET system for each member state countries would accelerate the realization of SDG 4.

The following desk review studies in Indonesia and Malaysia illustrates further the challenges faced in implementing TVET education that meets and address the SDG4 related targets.

i. Indonesia

In the context of Indonesia, BELMO's laboratory equipment at Vocational High School was funded by the World Bank and is no longer compliant with new audio video technology innovations. Hence, Vocational High School teachers cannot use the facilities for teaching. Similarly, the workshop 's open architecture is not tailored to the new audio-video technology, resulting in criticisms from the students. The challenges that teachers face in formulating instructional strategies are largely attributable to their inability to establish laboratory instructional standards due to the excessive number of materials and equipment to the number of students. In this case, material refers to the resources used in the learning process, in which there are small server capacities, internet has not been evenly distributed and lack of access to speed internet network (Suartini 2019).

Based on a case study of the best vocational high schools for the Audio-Video Techniques competency, it is unlikely whether such vocational high schools will be able to face the ASEAN Economic Community (AEC) 2015. The skills qualifications of high school vocational graduates are still poor or graded into operator level. In the 2015 AEC age of free trade, expertise is not sufficient to face the changes from analogue to digital technology. The 2013 Curriculum to improve basic competencies is also under revision until recently. This would influence changes in instruction orientation. Most precisely, there will be changes from workshop-oriented instruction to laboratory teaching, such as in 2006. In this AEC era, social awareness of the related technology is becoming even more important in the context of vocational high school. AEC requires the awareness and concern of the society, students and parents that still appears to lack (Kacan, 2014 in Suartini 2019).

In addition, the implementation of the optimal ratio of practical instruction to principal instruction for fundamentals of electricity and electronics is 2 to 1, where theoretical instruction is done once, school practice twice, and industrial practice 4 times. Based on the students' observation, it is shown that instructions of electricity / electronics theories and concepts are highly required in laboratories. It is particularly true for students assigned to lay out and assemble electronic devices.

The challenges that teachers face in laboratory teaching often stem from the students' insufficient amount of equipment. One instructional task missing the necessary equipment / materials is the installation or completion of troubleshooting for electronic devices, such as for the regular CD recording competence. Therefore, the video / film / flash media were used as alternatives. Not all teachers can use the alternative media, however. Usage of the mainstream media according to their comments, is providing better and fast understanding (Suartini 2019).

The inadequate number of trainer modules and the low capacity of the laboratory and practicum rooms are another issue. The restricted facilities, equipment, and materials cause the instructions to fail to adhere to laboratory instruction requirements. Consequently, the teachers ' instructional technique or solution is the traditional one. One may assume that traditional teaching is to be teacher centered. This approach is suited to the conditions, situations, and readiness of the school (Suartini, 2019). Laboratory and laboratory manuals are very difficult to handle and to coordinate with the existing space and facilities conditions. This applies to the instructional activities which follow experimental methods for testing materials and calibrating equipment. The lack of suitable measuring instruments makes it difficult to check audio-video equipment to resolve the changes from the analogue to the digital technology.

ii. Malaysia

The Malaysian training institutions are expected to reduce the number of students per class and provide more training spaces and provide ample access to modern technology. This would provide students with more opportunities and encouragement in their learning processes, especially in performing more tasks and building greater trust in refining their practical skills (Kamin et al.,2018). Five years behind the automotive industry, the engineering facilities were not seen as contemporary and used technology. Education institutions need more advanced technologies through close and open education arrangements within the sector, both at technical and further education (TAFE) institutes and in community colleges.

Along with the lecturer's competency, the Malaysian training institutions seem to under-emphasize best practice in the auto-motive industry. Only a few Malaysian trainers have increased in the automotive sector, and 10 percent are from the aerospace industry. This deficiency on the part of trainers should be corrected or at least managed better, in particular by attempts to recruit trainers with the appropriate qualifications required for teaching within the training system (Kamin et al., 2018).

Subsequently, TVET teachers are also being investigated for job satisfaction to gain their views on the eight aspects mentioned: salary, promotion, benefits, supervision, operational procedures, colleagues, working methods and communication (Mustafa et al. ,2019). More specifically, these technical teachers are not given laboratory assistants, such as science teachers (Shafie et al., 2014). According to Abas et al. (2004), other responsibilities such as being a subject committee and co-curriculum instructor will burden the teachers in effectively organising their classrooms and life skills workshops. The lack of help such as laboratory assistance, further heightens the teacher workload as he or she is also responsible for the management of workshops and for equipment, inventory, material storage, 5S and cleanliness of the workshop. Such extra burden will indirectly affect his/her job's satisfaction.

Another problem was that after completion, TVET students / trainees lack attitudes and interest in self-employment while the country 's policy promotes the emergence of new and young entrepreneurs. Most TVET graduates and students do not see entrepreneurship as a career choice. Despite the various opportunities to start up a business either securing loans from government or

union, often the sustainability of the business is short lift. Research on TVET students towards self-employment is a burning and timely issue as middle-level skilled workforce participation and involvement in job creation is very much needed to generate the country's dream of economic growth, as well as helping the government provide job opportunities.

5.3.2 Unique Challenges

In terms of unique challenges faced by each country. Brunei Darussalam focusses on the need to realign TVET with the demand of industries that support national economic development to achieve Brunei Vision 2020. Thus, the challenges revolve around addressing critical success factor to achieve the vision- namely enhancing the Public- Private- Partnerships. The open-ended responses from sample of Brunei Darussalam reinforce this challenge.

> *There is lack of cooperation from industry and not many companies participate with the initiative done by the TVET i-ready scheme. Some industry not helping (not much cooperation) much with the development of the curriculum.*

Indonesia focusses on improving the quality of the TVET program by addressing the quality of teachers and activities leading to competent workers that achieve a qualification that is not only for Indonesia but has also achieved a recognition at the regional and international levels.

Malaysia's challenge is lessening the duplication of TVET programmes from various ministries. The image associated to TVET and TVET career have been a stigma for the society thus the challenge for Malaysia is to overcome the ingrained perception among the public and students of TVET being the last choice among the students. A particular area of concern is to provide salary levels that commensurate with the qualifications. This is also illustrated in the open-ended responses:

> *Majority of the challenges posed by the respondents are related to the low image of TVET by the public and students. Among the negative perception linked to the low image is that TVET are only for low achievement students hence the mind-set TVET is seeing as the second choice or commonly known as second class education. In addition, students are unable to know the direction they want in TVET certification.*

> *Another challenge mentioned by the respondents is the lack of lifelong learning opportunities- especially for those who like to continue their studies while working. Skill development through upgrade training and work opportunities are needed. TVET program also need to be attractive enough to get sufficient interest for students to continue learning at the higher education institutions.*

> *A persistent view among students and parents that hinders the promotion of TVET as the career choice is the lack of prospects for graduates to find a job and the job in the same field that they graduated in. In addition, for vocational jobs, local graduated have to compete with foreign workers in the job market. The salary offered by the careers in TVET is yet to be upgraded or decent that commensurate with the skills obtained.*

The Philippines espoused the need to equip workers with skills for industry 4.0. Thus, the Philippines faced challenges in enhancing the Public-Private- Partnership so as skills development would meet the priorities of the industries. The Philippines in their review of the policy implementation realised the need to be inclusive- in particular in accommodating workers who are left behind in terms of qualifications but with endowed industrial experiences.

Lastly, Timor-Leste concern begins with policy coordination and implementation. Financing is an issue with Timor-Leste that will also determine the ability of TVET system providing free access to

ALL- which is the mandate of Target 4.3 of SDG 4. Like Malaysia, Timor- Leste also faced the challenge to encourage TVET as the choice of the students. Capacity growth in terms of skill development among the students could be stunted with the lack of qualification and training of the instructors in offering quality TVET. In addition, as mentioned by one high ranking official:

> *Timor-Leste is a new country, as well as a resource-poor country. While TecVoc is very important, setting up a technical vocational school is extremely costly, both in terms of its infrastructure and equipment, as well as the challenge of recruiting suitable human resources. These challenges are compounded by the fact that technical-vocational training is constantly evolving as the world's technology rapidly advances.*

6.0 Recommendations

All the Five Cluster Countries view the role of TVET as a platform for developing skilled workers towards economic development, unemployment and crime reduction. All five countries, from the policy review, aim to ensure high quality TVET programs leading to developing skills not only relevant for industries needs but also skills, attitudes and knowledge that would enable one to be entrepreneurial as well as towards being able to secure a decent job that is beyond the technical and vocational fields.

Nevertheless, in order aspirations as stipulated in the policies are materialize, the review found common issues that need to be addressed including: i) ensuring quality TVET programs, ii) raising the image of TVET education and TVET career as THE choice among students, iii) ensuring skills identified for industry 4.0 for TVET programs, and iv) embracing the marginalized communities in TVET programs. These recommendations are suggested prior to COVID-19 as well as response to the outbreak.

Recommendation 1: Ensuring Quality TVET programs

1. Enhance the intake of teachers and instructors who have industrial training as well as providing ongoing professional development with industrial attachment as a focus.
2. A return-to-industry plan could be developed for lecturers, teachers, and trainers.
3. Enhance the competencies of teachers and instructors towards student, problem solving and practical oriented of teaching and learning.
4. Further collaboration with industry partners. More collaboration and partnership with industries in running TVET courses. Create programmes that aligns and can cater for the future direction of the country.
5. Budget allocation should be commensurate with the curriculum reform as well as for maintenance of equipment.
6. In light of the pandemic COVID-19 situation, competencies of teachers of alternative delivery namely remote and digital based teaching and learning are crucial (*UNESCO issue note no 5.2 and Webinar on TVET* U*NESCO Caribbean region)*
   - 6.1. Develop country's own distance learning modality for TVET (online and offline).
   - 6.2. Enhance and support educators and instructors' competencies to create and adapt to remote distance and virtual TVET mode of learning and teaching.
   - 6.3. Provide provision of teaching materials and equipment to enable the continuation of practical aspects of TVET.
7. Realignment of curriculum and certification in light of pandemic COVID-19 situation
   - 7.1. Develop curricula, teacher training, quality assurance, assessment, and certification for distance TVET.

7.2. Plan for remedial classes that would include offering the curriculum term based rather than semester based, enhancing formative assessment versus summative assessment and longer practical time to cover the loss learning and practical time which is badly disrupted by the pandemic COVID-19.
7.3. Develop Standard Operating Procedure (SOP) to ensure hands- on practical training are scheduled ongoing while observing the health protocols.
7.4. Guidelines from national accreditation bodies need to be put in place to support institutions to realign curricula, delivery, assessment, and standards suitable for blended learning modality in order to ensure quality of overall program is maintained especially the skills demonstrated are certified.
7.5. Utilization of technology from digital technology to non—digital technology is implemented depending on the context and resources of the country.

8. Practical assessment is deferred. If practical to be assessed then it will be done periodically, after completing a few sessions of theory and extend the length of the study.
9. Conduct a study to develop a program of social and emotional support for affected students and teachers to address - overcoming learning loss; promotion to higher grades/class; admission to higher education (selection) and technical, social, and emotional support for school community, which is already embarked by Timor-Leste.
10. Sharing of best practices as a result of practical implementation and empirical findings among member states, as a reservoir of evidence-based practices that could be emulated within the context of respective countries.
11. Proper intervention should be planned when the institutions reopen especially catch-up programs such as tutoring, and coaching involving not only teachers but also volunteers.
12. Recruitment and retraining of teachers to address the new norm of teaching and learning need to be expediated. This would include developing preservice and in-service training programs that are flexible, durable, and adaptable to any forms of calamities may it be health, nature or psychological force.

Recommendation 2: Enhance image of TVET as the educational choice

1. Develop strategies on careers education and careers counselling focusing on the flexibility pathways and prospects of TVET career in the global economy.
2. Provide career guidance on TVET to cover all students from primary to higher levels.
3. Provide career guidance and counselling services to marginalized and vulnerable groups in community centers.
4. Enhance a reliable quality assurance mechanism for TVET graduates so to standard of knowledge, skills (hard and soft skills) acquired that would allow TVET graduates to reach to not only vocational and technical employments but could also to jobs that could provide decent wage and image.
5. Conduct benchmark quality assurance system among member states so as to allow work force around the sub-regional area possible and for the opportunity for lifelong learning in TVET.
6. Intensify information dissemination campaign of TVET programs so that interested participants are well informed of their different programs.
7. TVET qualification must be accepted as an equivalent qualification to academic degree from higher education institutions. It is also recommended that only one organization to be given the status to award the qualification.
8. Increasing the salary of technical workers would help to boost the image of TVET programs and qualifications.

Recommendation 3: Ensuring 4IR skills in TVET programs

1. Enhance participation industries' opportunities involved in TVET curriculum development and implementation in preparing students with the most up-to-date knowledge and skills needed for global economy.
2. Expanding the current job placement criteria to ensure student needs meet employer 's awareness and ability standards.
3. Focus on technical-vocational areas that do not require much technological trappings for in-country training.
4. Develop partnerships with other countries, so that in educational exchanges could be done, allowing countries in need be able to familiarize with the most up-to-date technologies and with modern equipment.

Recommendation 4: Embracing marginalized communities in TVET programs

1. Ensure equity in TVET enrolment especially among the most vulnerable students and disadvantaged groups throughout the pandemic and more so after it is over.
2. Develop a comprehensive data base that captures demographic and social welfare data of marginalized and vulnerable groups that later could advise the policy directions of TVET.
3. Empower and support the non and informal TVET training and traditional apprenticeship as this form of education is easily accessible to the marginalized and vulnerable groups through their local communities.
4. Enhance the coordination between and within ministries regarding data management namely enhance synchronization of data that could lead to high quality data.
5. Create a communal learning space or hubs in the community for face-to-face skills training. Learning hubs are expected to observe the health protocols.

7.0 Conclusion

This review explored the development and implementation of TVET. An analysis from the empirical studies, policies documents and empirical survey data on the issue was adequately obtained. It is evident from TVET 's complexity that this type of education will soon become a prominent feature of tertiary education, as it supports the increasing demand for technical and vocational graduates in middle-income countries such as Brunei Darussalam, Indonesia, Malaysia, Philippines and Timor-Leste.

All member states of UNESCO Jakarta developed TVET policies based on the national socio-economic development, respectively. All countries showed untiring commitment to developing and improving TVET policies and program towards achieving SDG4 TVET indicators- namely on accessibility, skill development and equality. The policies, despites, its strength, it should also be acknowledged through this review that there are concerns related to the efficacy and challenges.

Effective private- public- partnership and coordination within ministries, is one of the critical success factors of a TVET program towards preparing highly skilled workers for the industry. These will involve joint projects with training institutions designed to prepare colleges and students with the most up-to - date knowledge and skills needed for global economy work. Given that there are gaps in current technical skills with the technical skills needed for IR 4.0, it is recommended that TVET institutions restructure the learning process of the software, getting to know network structures to master big data technologies, especially beyond COVID-19.

This will ensure the educational tools are up to date with workplace expectations. A return-to-industry plan will be developed for institutionally oriented lecturers / teachers / trainers in addition to providing equipment. If that is not necessary, the current job placement criteria should be expanded to ensure student needs meet employer 's awareness and ability standards. This will allow for greater cooperation between organization and business, along with longer periods of placement in the real-life work environment.

Existing sector regarding embracing total inclusivity lack of high-quality data to offer definitive responses to concerns about TVET education policies. An effective TVET policy to address the issue of inclusivity would probably have to acknowledge and empower the traditional apprenticeships through local communities. Financing from the government is imperative in ensuring the sustainability of the training. Depending on the local context of the country, this marginalised group maybe the majority of the country in which the non and in-formal training is the best platform to fill the gap in achieving the education agenda 2030 through SDG 4 related to TVET system, policy, strategies and activities.

This review can therefore be a starting point for discussing and directing TVET practitioners on the inadequacy of implementation and the need to provide structure for implementation to achieve TVET's goals and objectives. The inclusivity component of SDG4 namely embracing the marginalised communities for TVET, needs more attention either through more studies on the issue or developing TVET policies and initiatives addressing the equity issue, especially once the pandemic COVID-19 is over.

8.0 References

Abdullah, Z., Hoque, K. E., Ramlan, N. H., & Shafee, S. (2019). *Designing the Structural Model of TVET Lecturers ' Professionalism and Generic Skills Based on an Empirical Study in Malaysia*. https://doi.org/10.1177/2158244019861456

Abas, L.Z., Nurasyikin, H., Masood, M., & Esa, A. Job Satisfaction Among Life Skills Teachers In Secondary Schools Of Kluang District, Johore, *Researchjournali's Journal of Education*, 2(1), 1-12

Alavi, K., & Awang, A. H. (2011). Work esteem and re-branding of technical education and vocational training from the perspective of parents and teachers. *Journal of Technical Education and Training* (JTET), 3(2), 1–18.

Alavi, K., & Awang, A. H. (2013). Image of technical education and vocational training from the perspective of parents and teachers. Journal of Technical Education and Training (JTET), 5(1), 68–88.

Ali, M. M., Hashim, N., Ibrahim, A., & Utara, U. (2017). *The Evaluations Of Facebook As An Educational Technology The Evaluations Of Facebook As An Educational Technology Tools In Polytechnic's Entrepreneurship Courses*.

Ana, A., Murniati, D. E., Saripudin, S., & Grosch, M. (2019). *Applicability of Competency-Based Assessment for TVET Interns : Comparing between Indonesia and Laos*. *2*, 45–56.

Ashari, Z.H.M., Azman, N. & Rasul, M.S. Factors predicting career choice among Malaysian students in skills-based training institutions. *Int J Educ Vocat Guidance* 19, 19–39 (2019). https://doi.org/10.1007/s10775-018-9366-5

Mohammad, B.A.A. & Alsaleh, H.T. (2013). Motivation of Students to Study Tourism Hospitality Programs, *International Journal of Asian Social Science, Asian Economic and Social Society*, 3(7), pages 1637-1647

Dacre Pool, L., & Sewell, P. (2007). The key to employability: developing a practical model of graduate employability. *Education + Training*, 49(4), 277–289.

Department of Skills Development, DSD. (2011a). Rationalizing the implementation of Technical Education and Vocational Training (TEVT) (Internal Report). Putrajaya, Malaysia:

Department of Skills Development, DSD. (2011b). Tahap kebolehkerjaan graduan persijilan kemahiran Malaysia di Institut Latihan Kemahiran Awam (ILKA) (Internal Report). Putrajaya, Malaysia:

Department of Skills Development, DSD. (2011c). Kajian kebolehkerjaan graduan PKM biayaan perbadanan tabung pembangunan kemahiran. (Graduates employability from Malaysian skills certificate sponsored by skills development training scholarship) (Internal Report). Putrajaya, Malaysia:

Department of Skills Development, DSD. (2012). Tahap penerimaan masyarakat terhadap latihan kemahiran di Malaysia (Level of acceptance on skills training in Malaysia) (Internal Report). Putrajaya, Malaysia: Department of Skills Development.

Dogara, G., Sukri, M., Saud, B., Kamin, Y. Bin, Zolkifli, M., & Safarin, M. (2019). *Developing Soft Skills through Project-Based Learning in Technical and Vocational Institutions*. *1*, 2842–2847. https://doi.org/10.35940/ijeat.A9803.109119

Economic Planning Unit. (2011). Keperluan tenaga kerja dalam bidang kemahiran dan teknikal (Skill labor demand in TVET) (Internal Report). Putrajaya, Malaysia: Department of Skills Development.

EPU (Economic Planning Unit). (2015). Strategy Paper 9: Transforming Technical and Vocational Education and Training to Meet Industry Demand. Eleventh Malaysia Plan, 2016–2020: Way Forward, p. 18. Retrieved from http://rmk11.epu.gov.my/ pdf/strategy-paper/StrategyPaper09.pdf.

Eleventh Malaysia Plan (2016-2020), Anchoring Growth on People

Fristia, V. F., & Navastara, A. M. (2014). Faktor Penyebab Belum Berkembangnya Industri Kecil Batik Desa Kenongo Kecamatan Tulangan-Sidoarjo. Jurnal Teknik ITS, 3(2), C190-C195.

Gardner, J. (2018). *Gender & Sustainable Development in Timor-Lester: Key to leaving no one behind*. Timor- Leste: UN Woman

Gibb,J.(2004), "Generic skills in vocational education andtraining:research readings",NationalCentre for Vocational Education Research (NCVER), Adelaide.

Hashim, S., Hishamuddin, M., Rahman, A., Nincarean, D., Jumaat, N. F., & Utami, P. (2019). *Knowledge Construction Process in Open Learning System among Technical and Vocational Education and Training (TVET) Practitioners*. *1*, 73–80.

Hassan, R., Razzaly, W., & Alias, M. (2012, December 25-28) Technical and vocational education teachers in Malaysia. A Country Paper presented during the Experts Meeting organised by SEAMEO VOCTECH and UNESCO-UNEVOC in Conjunction with International Conference on The Excellence in Teacher Education and Research Innovation by Rajabhat Universities Network, Bangkok, Thailand.

Hassan, S., Shafiq, A., Firdaus, K., & Jimisiah, J. (2018). Education supply chain : A case study of input-process-output of high technical vocational education and training (HTVET), *International Journal of Engineering and Technology*, *7*, 60–61.

Hassan, S., Shamsudin, M. F., & Hasim, M. A. (2019). *Mediating Effect Of Corporate Image And Students ' Satisfaction On The Relationship Between Service Quality And Students ' Loyalty In Tvet Hlis*. *24*, 93–105.

Higher Education Institution Entrepreneur Action Plan 2016-2020. Available at http://www.mohe.gov.my/ fokus/231pelan-tindakan-keusahawanan-ipt-2016-2020 (accessed July,15, 2017)

Abdul Karim, Z. I., & Maat, & S. M. (2019). Employability Skills Model for Engineering Technology Students. Journal of Technical Education and Training, 11(2). Retrieved from https://publisher.uthm.edu.my/ojs/index.php/JTET/article/view/3196Indonesia Ministry of Education and Culture and the United Nations Children's Fund (2017). *SDG4 Baseline Report for Indonesia*. Jakarta: KEMDIKBUD and UNICEF.

Ismail, A. & Abiddin, N. Z. (2014). Issues and challenges of technical and vocational education and training in Malaysia towards human capital development. *Middle-East Journal of Scientific Research*, 19, 7–11.

Ismail, S., and Mohammed, D.S. (2015), "Employability Skills in TVET Curriculum in Nigeria Federal Universities of Technology", in: Procedia - Social and Behavioral Sciences 204, pp. 73-80, doi: 10.1016/j.sbspro.2015.08.111.

Ismail, A. A., & Hassan, R. (2019). Technical Competencies in Digital Technology Towards Industrial Revolution 4.0. *Journal of Technical Education and Training*, *11*(3). Retrieved from https://publisher.uthm.edu.my/ojs/index.php/JTET/article/view/3208

Kamaliah, S., Roslan, S., & Bakar, A. R. (2018). *The effect of supervised work experience on the acquisition of employability skills among Malaysian students*. *Higher Education, Skills and Work-Based Learning*, № 4, p. 354-364354–364. https://doi.org/10.1108/HESWBL-05-2016-0028

Kamin, Y. B. I. N., Sukri, M., Saud, B. I. N., Yahaya, N., Al-rahmi, W. M., Latib, A. A., Ahmad, A., Amin, F., & Cartledge, D. (2018). Comparative Analysis of Students Perception on the Relevance of Diploma Certificate in Automotive Engineering to the Industry. *IEEE Access*, *6*, 79129–79137. https://doi.org/10.1109/ACCESS.2018.2883694

Karabulut-Ilgu, A., Jaramillo Cherrez, N., & Jahren, C. T. (2018). A Systematic Review of Research on the Flipped Learning Method in Engineering Education. *British Journal of Educational Technology*, 49, 398-411. https://doi.org/10.1111/bjet.12548

Kementerian Pendidikan dan Kebudayaan. (2013). Development of the curriculum in 2013. Jakarta, Indonesia: Departemen Pendidikan dan Kebudayaan.

King,K. & Palmer, R. (2010). Planning for technical and vocational skills development Paris.UNESCO: International Institute for Educational Planning

Mahazir, I. (2019). *Identifying the Employment Skills Among Malaysian Vocational Students : An Analysis of Gender Differences*. *3*, 115–120.

Mahazani. (2011). Development of a new empirical based competency profile for Malaysian vocational education and training instructors. Putrajaya: Politeknik, Kementerian Pendidikan Tinggi Malaysia.

Mohamad, N. H., Selamat, A., Ibrahim, B., & Mohd. Salleh, B. (2019). Exploration of Spiritual Elements in Holistic-Entrepreneur (Holistic-E) among TVET Graduate Students. *Journal of Technical education and Training,* 11(*3)*, 73–83.

Malaysian Qualification Framework (MQF) (2005). Guidelines on Standards of the Bachelor Degree Level. (1). Kementerian Pendidikan Malaysia; 2005. Retrieved from http://www.mqa.gov.my/portal2012/dokumen/MALAYSIAN%20QUALIFICATIONS%20FRAMEWOR _2011.pdf.

Mustafa, M. Z., Buntat, Y., Ahad, R., Abdul, A. R., & Bokhari, N. (2019). *Job Satisfaction Survey : A Confirmatory Factorial Analysis Based on Vocational Colleges Teachers Sample*. *3*, 144–154.

Sodipo, O.O. (2014). Employability of Tertiary Education Graduates in Nigeria: Closing the Skills Gap, *Glob. J. Hum. Resource. Management*. 2(3):28–36

Othman, I., & Yaakub, R. (2010). Multiple intelligence applications in curriculum implementation [Aplikasi teori kecerdasan pelbagai dalam Pelaksanaan kurikulum]. *Asia Pacific Journal of Educators and Education*, 25, 21-32.

Othman, N. H., & Ishak, S. (2011). Kecenderungan Terhadap Pemilihan Kerjaya Keusahawanan Mengikut Persepsi Peserta Skim Usahawan Siswa. *Sains Humanika*, 56(1).

Paryono. (2017). The importance of TVET and its contribution to sustainable development. In AIP Conference Proceedings (Vol. 1887, No. 1, p. 020076). AIP Publishing.

Rajadurai, J., & Mazuin, N. (2018). The Marketability of Technical Graduates from Higher Educational Institutions (HEIs) Offering Technical and Vocational Education and Training (TVET): A Case from Malaysia. *The Asia-Pacific Education Researcher*. https://doi.org/10.1007/s40299-018-0372-7

Nanda R. N. (2010). The Integration of Identified Employability Skills into the Namibian Vocational Education and Training Curriculum. Unpublished PhD thesis, Stellenbosch University

Shafie, S., Abdul Kadir, S. & Asimiran, S. (2014). Workload Of Technical Secondary School Teachers: Management And Administration's Perceptions, *Malaysian Online Journal Of Educational Management*, 2(4), 21 - 35

Suartini, T. (2019). Influence Application of Learning Model on Vocational Education Based on Quality Issurance. *SAGE Open*, April- June: I-II https://doi.org/10.1177/2158244019851552

Atsumbe, T.M. & Saba, B.N. (2008). A Study on Affective Work skills Needs of Engineering and Technology Education Students of Universities in the North Central States of Nigeria. *Bayero J. Pure Appl. Sci*., 1 (1): 95–98

T. N. Dahunsi, (2017) Graduate Employability and Communication Skills: An Investigation of Nigerian Graduates‟ Proficiencies and Areas of Deficiencies in Written English, *World Journal of English Language*, 7(3): 49

UNESCO (2010). Good Practices in TVET Reform. Paris, France: UNESCO.

UNESCO. (2017). Towards Quality Assurance of Technical and Vocational Education and Training. ISBN 978-92-9223581-9

UNESCO. (2018). *TVET Country Profile: Brunei*.

UNESCO. (2019a). *Regional Capacity Development Resource Book on Monitoring SDG4-Education Lorem ipsum 2030 in Asia-Pacific*.

UNESCO. (2019b). *TVET Country Profile: Malaysia*.

UNESCO. (2019c). *TVET Country Profile: Philippines*.

UNESCO. (2020a). *TVET Country Profile: Indonesia*.

UNESCO. (2020b*). TVET Country Profile: Timor-Leste*

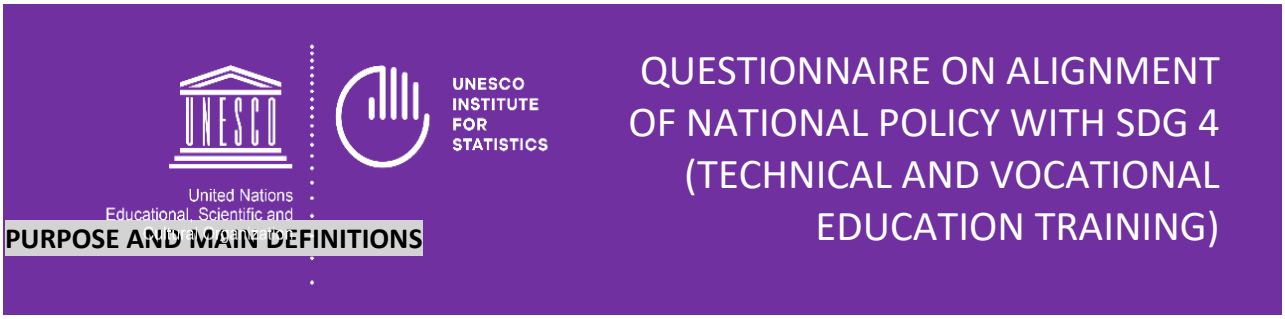
UNESCO. (2020c). UNESCO COVID-19 Education Response Education Sector Issue notes n° 5.2 ,April 2020, UNESCO.

UNESCO. (2020d). COVID-19 Education Response Webinar Skills Development During the COVID-19 Pandemic and Preparing For Recovery, unesco- covid-19_ed-webinar-8-concept-note-en.pdf

Winarno, S., Muthu, K. S., & Ling, L. S. (2018). *Impacts of m-DPBL Approach towards Computer Networks Teaching and Learning Process State of the art*. *13*(3), 207–215.

World Economic Forum. (2017). Realizing Human Potential in the Fourth Industrial Revolution An Agenda for Leaders to Shape the Future of Education, Gender and Work, (January), 35. unesco.org/eforum/CompetenceStandardsforTVET.pdf

Appendix 1 Survey Questionnaire



The purpose of this questionnaire is to gather information about countries' existing and ongoing policies and its alignment with the United Nations' Sustainable Development Goal (SDG) 4. The information collected in this questionnaire will be used to develop a policy review on 5 cluster countries to observe commonalities and uniqueness between countries and recommendations for nations to keep track and learn from each other.

UNESCO, Jakarta office as the Cluster Office to Brunei Darussalam, Indonesia, Malaysia, the Philippines and Timor-Leste has been supporting the Member States to achieve Sustainable Development Goal 4 to promote Quality Education through 2020-2021 Regular Programs in five education areas;

i) Sector-wide Policies and Plan;
ii) Technical Vocational and Education Training (TVET);
iii) Teacher Policy and Plan;
iv) Education for Sustainable Development (ESD);
v) Inclusive Education.

Sustainable Development Goal 4

TARGET 4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.
TARGET 4.2: By 2030, ensure that all girls and boys have access to quality early childhood development, care and preprimary education so that they are ready for primary education.
TARGET 4.3: By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.
TARGET 4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.
TARGET 4.5: By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations.
TARGET 4.6: By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy.
TARGET 4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and culture's contribution to sustainable development.
TARGET 4a: Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.
TARGET 4b: By 2020, substantially expand globally the number of scholarships available to developing countries, in particular, least developed countries, small islands developing States and African

countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programs, in developed countries and other developing countries.

TARGET 4c: By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small islands developing States.

INSTRUCTIONS FOR COMPLETING THE QUESTIONNAIRE

Please read these instructions carefully. If there are any uncertain definitions of key terms, the participant may refer to the glossary and description of the five areas. Please provide information about the participant that completed this questionnaire. Please answer all questions that apply and provide comprehensive comments for each question as required. If you have any queries on how to answer this questionnaire, please contact UNESCO, Jakarta Office.

CONTACT information

UNESCO Jakarta

GENERAL INFORMATION

Please provide information on the authoritative person to complete this questionnaire.

The person completing this questionnaire should be an official representative of the Ministry of Education or corresponding institution in the country. The person should be well-informed of the country's participation at least in ONE of the five areas.

1. **Country**

Brunei Darussalam	[ ]
Indonesia	[ ]
Malaysia	[ ]
Philippines	[ ]
Timor-Leste	[ ]

2. **Gender**

Male	[ ]
Female	[ ]

3. **Age**: ……..(years)

4. **Education Level**

Diploma	[ ]
Bachelor's Degree	[ ]
Master's Degree	[ ]
Ph.D	[ ]

5. **Ministry / Department / Division / Institution / Schools:**

……

6. **Year of experience in the education field**

Less than 5 years	[ ]
6 to 10 years	[ ]
More the 10 years	[ ]

7. **Expertise**

Technical, Vocational and Education Training (TVET)	[ ]
Teacher Policy and Plan	[ ]
Education for Sustainable Development (ESD)	[ ]
Inclusive Education	[ ]
Early Childhood Education	[ ]
Primary Education	[ ]
Secondary Education	[ ]

8. **Email:** ……

Instruction for completing the survey

This questionnaire covers the Sustainable Development Goal 4 Targets regarding the area of Technical and Vocational Education Training (TVET) and its relation to your country. Please tick (✓) on the opinion upon each statement referring to the level of the agreement indicates below;

1: Strongly disagree
2: Disagree
3: Agree
4. Strongly agree
0. Undecided / Unsure

In my opinion…

No.	Statement	Level of Agreement				
		1	2	3	4	0
1	The number of men and women participating in TVET is equal.					
2	The TVET courses offered are equally appealing to men and women.					
3	Most of the courses offered in TVET are suitable only for men.					
4	The number of TVET institution is adequate.					
5	TVET institutions are accessible in every locality of my country.					
6	Public is aware of the courses offered in TVET.					
7	TVET courses are affordable.					
8	Government allocate sufficient budget on TVET.					
9	Government allocate sufficient budget to assist participants who cannot afford to participate in TVET.					
10	Monitoring agencies play an effective role in ensuring TVET curriculum with accepted standards.					
11	Achievement of TVET in my country is recognized internationally.					
12	TVET is offered for both youth and adult.					
13	TVET courses are relevant for the 21st century.					
14	TVET graduates are able to compete locally.					
15	TVET graduates are able to compete regionally and globally.					
16	TVET graduates able to get a job easily after completing their study.					
17	The salary for TVET graduates is commesurable to the job.					
18	Entrepreneurial skills are exposed in TVET courses.					
19	TVET is offered for persons with disabilities.					
20	TVET is offered for indigenous people.					
21	TVET is offered for children in a vulnerable situation.					

No.	Statement	Level of Agreement				
		1	2	3	4	0
22	TVET in my country promotes drop-outs to participate.					
23	Scholarships are offered to promote public to participate in TVET.					
24	Capacity to extend TVET to higher education is available					
25	Capacity to extend TVET as lifelong learning is available.					
26	Initiative to promote internship of TVET graduates by partnerships with the private sector is available.					
27	TVET facilities are sensitive to participants with disabilities.					
28	TVET facilities are sensitive to gender.					
29	TVET facilities are safe.					
30	TVET environment is inclusive.					
31	TVET facilities promote effective learning.					
32	TVET facilities are upgraded from time to time.					
33	TVET facilities are adequate.					
34	TVET facilities are mostly obsolete.					
35	TVET facilities are relevant to current education needs.					
36	Allocation of fund on TVET facilities is sufficient.					

1. What are the challenges faced in TVET in your country?

2. What are the recommendations can you suggest for TVET in your country?

3. How does your country respond to COVID-19 pandemic in TVET (e.g. delivery, modification of curriculum, online resources, educator competencies in online platform, assessment, accreditation)?

Appendix 2 Open-Ended Responses (Raw Data)

Open-ended responses (raw data)
Brunei Darussalam

What are the challenges faced in TVET in your country?	What are your recommendations and suggestions towards the improvement of TVET in your country?	How does your country respond to the impact of COVID-19 pandemic on TVET (e.g. curriculum delivery, modification of curriculum, online resources, educator competencies in online platform, assessment, accreditation)?
Doing hands on practical sessions during the school closure	To include more creative industries program	IBTE used online learning(Microsoft Teams and Zoom) also via email and a drop box inside campus to submit any assessments.
Commitment from industry partners to train and absorb students/graduates as employees.	Further collaboration with industry partners	Adjustment of curriculum delivery from classroom based to online learning. For practical classes, small classes are conducted to ensure that both instructors and students abide by the health regulations issued by Ministry of Health.
Obsolete equipment, limited budget, face difficulties to align with the industry needs	More collaboration/partnership with industries in running TVET courses	Good response to covid .. luckily Brunei less impacted with covid.. only for few months only.. but Brunei have responded well with the pandemic, teaching and learning were done online
1. Low average salary for TVET graduates, 2. Graduates are particular in choosing their jobs, 3. Industrial sectors are not as mature as compared to other countries, 4. Oversupply for graduates for some programmes	1. Create programmes that aligns and can cater for the future direction of the country, 2. Updated tools and equipment needed, 3. Global exposure needed for the graduates, 4. A clear career progression and salary figures needed for TVET related jobs.	Microsoft Teams were utilised during the Work From Home period.
Many Equipment and facilities are outdated.	Develop trust and do not lead by fear.	Online resources, online teaching, online assessments
Challenges to produce skilled students that will be able to work as soon as they graduated	Exposed teachers to more skills training	Lecture was easy to made online but the assessment for TVET still require a face-to-face interaction
Not enough instructors on specific field	Provide more instructors relevant to each course & provide training for instructors(upgrade)	Good
in sufficient resources	to ensure the students are ready to join the relevant skill required by industry	online learning
The training of the teachers may not be sufficient to meet the industrial needs and skills.	Teachers hired need to come from industry, or teachers need to be more exposed to industrial attachments.	Online learning has been encouraged by IBTE, although training for the teachers is still required in terms of online delivery. For modules where, online learning is not possible, for example welding and painting. Students are asked to come to school in small numbers while practicing physical distancing.

No of instructor	TVET instructors to be given chances to do their PhD	Not applicable
Technical facilities and equipment inadequate	To allocate budget on improving TVET facilities and equipment	none
Beside oil and gas, other industries are very small and not booming. Thus, it is hard to do collaboration, funding and attachment/internship.	-	COVID-19 doesn't impact or disrupt the education system in Brunei as much. It was only affected for one to two months where school had to do online teaching and learning, and for students who doesn't have access to internet or necessary equipment, schools provided an alternative 'school pack'. Teachers were provided training and support on how to use Microsoft teams to do online teaching.
Acquiring enough instructor for the course as well as acquiring learning and teaching resources up to par with the current technology in the industry. Aligning the certification to the international standard.	Acquiring instructors with many years of professional experience	Migration towards online learning and implementation MOH measures for COVID
Keeping up with industry demand and expectations. Keeping up with other regional TVET institutions. Lack of teaching staff that have relevant skills and expertise.	TVET needs an injection of resources (time, money, manpower and infrastructure) to be able to keep up with industry demands and regional institutions. Review the way government owned TVET institutions are run and funded. The ministry has to be brave enough to find, implement and execute a plan that will be able to produce the manpower needs that the country needs in the future.	Many practical skills could not be taught as they require demonstration and practise. The current level of technology in the country cannot replicate a genuine environment where the instructor is there to train the student. Assessments were changed to assignments or interview questions done virtually. Some practical assessments were still done, but many precautionary measures had to be taken and this took quite a lot of time in order to complete.
Certification accreditation of HNTEC is not recognised globally, equipment not able to cope with the ever-changing technology	Assessments, Teaching and Learning need to be more focus on professional attitudes development starting from primary and secondary schools. This attitude will help to shape students learning and thinking skills.	All staffs were recommended to use Microsoft Teams for teaching, learning and assessment. It was a good initiative yet some were struggling to adapt to changes as it was happening in a span of 1 week to prepare online classes.
To make sure all the necessary skills for industries can be pass to the students and to make sure the students practice their skills for their job in industries.	To give the proper training for the instructors to improve their skills and up to date with the industries	The students are divided into 2 teams. Where team A will attend their practical where team B will stay at home and do some readings for their practical preparation on the next day. This will be the same when Team B attend their practical at school and Team A will stay at home
The capture rate to TVET institutions is low. This is due to the limited number of places	Perhaps, allocate more budgets into TVETs. If this is not possible, may be to	Online learning was offered in respond to COVID19 pandemic.

which would be offered due to the limited capacities in terms of infrastructure and Human Resources such as qualified instructors, available facilities, types of machineries and etc. Furthermore, the cost of running a TVET programmes involves a steep amount of financial resources.	strengthen the partnership between the public stakeholders and relevant stakeholders. When looking at the admission and graduates from TVET, most of them comes from programmes with Soft skills e.g. ICT and Business. The private TVET institutes offered most of these programmes, may be the private institution can offered more variety programmes other than the ICT and Business area.	
graduates not fully commit and taking the job offer relevant to their field as the salary are currently not enticing enough or too low for them. moreover, not many companies participate with the initiative done by the TVET i-ready scheme. few courses only available for progression. some industry not helping (not much cooperation) much with the development of the curriculum.	ministries to commit and support IBTE such as MPRT in any form of way such as facility, staff and resources.	TVET follow according to what MOH stipulated. also since TVET focus more on practical hands-on skills and hence affected in terms of time as capacity is limited
1. Lack of cooperation from industry 2. Lack of 21st century relevance	1. Ensure cooperation from stakeholders 2. Ensure nation technology is progressing	The impact is manageable but there are lost opportunities.
students and family members of the students mindset, education background and household habit could create a threat to any education system without their full commitment towards the students skill development, some students are still unable to accept the transition from high school to vocational settings	transitional period for the students, commitment made by the family members - support	satisfactorily, follow MOHealth advices
Insufficient quota in IBTE for completed secondary graduates	To increase capacity for further studies for IBTE Graduates, upgrading facilities from time to time	Supportive
1.Mismatch of employment for graduates 2. Demand for highly skilled workers in the industries 3. Limited course offered for catering for various industries	1. More industries relevant to the programmes offered by TVET institution to provide more employment 2. Revise numeration package for the TVET instructors/teachers to par with international standard	Proactive respond has been taken by the government across all agencies, spearheaded by MOH. Strict SOP has to be adhered to impacting schools' communities including parents. Teacher's Policy and plan also streamlining to the MOH key directive ie. Social distancing, max number of social groups, group contact time thus leading to modification of learning, interview, assessment via online

Technical facilities and equipment inadequate	To allocate budget on improving TVET facilities and equipment	none
Not enough quota/capacity for Year 10/11 school leavers in TVET/higher education due to insufficient resources; unemployment of TVET graduates	to increase/expand capacity in TVET/higher education; to provide more resources to TVET	Microsoft Teams as teaching and learning online platform, still being used until now

Open-ended responses (raw data)

Malaysia

What are the challenges faced in TVET in your country?	What are your recommendations and suggestions towards the improvement of TVET in your country?	How does your country respond to the impact of COVID-19 pandemic on TVET (e.g. curriculum delivery, modification of curriculum, online resources, educator competencies in online platform, assessment, accreditation)?
To get MQA accreditation	Industry must involve huge part with TVET	Theory class have no problem compare to subject with practical. Some more student dont have enough Internet excess
Pandemic	TO IMPROVE THE CURICULUM	Online
Upgrade training and work opportunities	Qualification of trainer is upgrade and the equipment to improve TVET sector	Modification of curriculum
To get the job in same graduate field	In race industries and technical business	On line method are suitable before practical work at lab
Not enough TVET School	To add more TVET classes in a school	to reduce TVET syllabus
Budget and manpower	Give the sufficient budget to us	Assessment in practical can't do in pandemic, school close
Job	More promotion about TVET to pupils in school	Pupils cannot apply the theory
budget from government is small for TVET programme and a lot of changing programme TVET syllabus	more extra training for the trainer to improve TVET skill	a lot of impact to run the TVET training programme
Career competition with foreign workers, and getting sufficient interest to students for higher learning	To continue focusing on TVET, while at the same time including the advancement of current technologies in the respective fields	The usage of IoT and online platform for teaching and learning. This actually promotes technology, and made the students and teacher aware of the existence of such technologies
Tools, equipment and machineries	Sufficient budget to upgrading the T.E.M	via module assessment plus google meet/zoom
The weakness of the student to focus on their studies.	Hope to be approved by the ministry of education as same level as graduated at least from the local Universities.	The lessons can be presented whether via online or offline but students cannot hands-on so this lead a bit lack to master the certain practical parts.
Perception from public just for low achievement students	Must have just one organisation are recognise graduate from any institution in TVET	Teaching use the online media for theory some however practical must be done also
Basic technology for primary education not strong enough to prepare a good technology for new world.	Create an effective tech subject to primary school and built more vocational college in every district.	Almost fail. Nothing can do to improve skills

N	n	Online
To change the mentality of societyin terms of TVET as second class education	Need a strong support from industry to involved developing human capital for them. Industry should support strongly to ensure the best practice been taught at TVET training centre	Online teaching and blended learning, in term of practical they have to pool at certain time after compeleted theortical.
Public awareness to promote the TVET sector hence the lack of prospects for graduate to find jobs	Promoting the TVET, incubator for TVET graduate start up, cooperation with private sector and major league players, internship.	Our government are trying it best to adapt to the new TVET education norm, training centres, schools, colleges n universities are coming up with various online approach to make sure their student can continue study n gaining the skill needed.
No or inadequate of Maintenance cost of the TVET facilities. Competition with foreign workers in job market.	Provide maintenance allocation for TVET facilities. Provide an adequate job for TVET graduate.	Online classes (non-face to face) n non hands on for TVET students.
Public perception	Build a fresh perception and awareness among public. Increase the payment / salary of technical workers.	No idea😊
Budget	More opportunities for teachers to upgrade skills	Sufficient but hard to implement because most TVET courses need to be face to face learning.
The system unorgnise	Reopen Technical teachers training college so that we can provide more skilful teachers that qualified to teach in vocational college or community college	Extend the time frame of study
Society	Raise budget	Modification of curriculum
Space and location	Need to relocate suitable location	Study online is still in first choice
technology	upgrade tool	slow
Mind set TVET second choice	Easier admits to TVET course	Home based learning take place Only offered in Vocational Schools
Salary	Employer need to takes many student TVET to works at their company	Online resources
to attract the interest of young people involved in the field of TVET	review the appropriate fields offered today	Ministry's of education make structure the skills field curriculum so that TVET graduates are highly skilled
Opportunity of work and continue their study.	Increase the facilities and increase the opportunity to further their studies to higher level.	Disrupts learning and assessment of student.
Pandemic	TO IMPROVE THE CURICULUM	Online
Not Enough Competent TVET educator	REMOVE THE BARRIER ENROLMENT IN HIGHER LEARNING (TVET) BASE ON QUOTA DAN BACE ON RACE	Don't know how to answer. is sensitive. We teachers not prepare for the impact of pandemic.

Only offered in Vocational Schools	Offered in Normal Schools	All practical and hands on using VPE
Facilities	TVET SHOULD START FROM PRIMARY SCHOOL	Online
Take time to adapted with new technology such us 3D printer and highly cost.	Adapt TVET thinking into silibus and do the real job.	Good but money is big issue to buy telecomucation data...
Limited Facilities	Provide facilities	Modified curriculum
Mind-set TVET second choice	Easier admits to TVET course	Home based learning take place Only offered in Vocational Schools
Salary	Employer need to takes many student TVET to works at their company	Online resources
to attract the interest of young people involved in the field of TVET	review the appropriate fields offered today	Ministry's of education make structure the skills field curriculum so that TVET graduates are highly skilled
Opportunity of work and continue their study.	Increase the facilities and increase the opportunity to futher their studies to higher level.	Disrupts learning and assessment of student.
Pendamic	TO IMPROVE THE CURICULUM	Online

Open-ended responses (raw data)

Philippines

What are the challenges faced in TVET in your country?	What are your recommendations and suggestions towards the improvement of TVET in your country?	How does your country respond to the impact of COVID-19 pandemic on TVET (e.g. curriculum delivery, modification of curriculum, online resources, educator competencies in online platform, assessment, accreditation)?
Lack of support from the government.	Set enough budget for TVET.	Lack appropriate response.
fund	dissemination	online
TVET programs in my country lacks information dissemination campaign.	Intensify information dissemination campaign of TVET programs so that interested participants are well informed of their different programs.	Like what other sectors are doing, education is delivered through online despite COVID-19 pandemic.
Lack of support from the government.	Set enough budget for TVET.	Lack appropriate response.
fund	dissemination	online
TVET programs in my country lacks information dissemination campaign.	Intensify information dissemination campaign of TVET programs so that interested participants are well informed of their different programs.	Like what other sectors are doing, education is delivered through online despite COVID-19 pandemic.

Open-ended Responses

Timor-Leste

What are the challenges faced in TVET in your country?	What are your recommendations and suggestions towards the improvement of TVET in your country?	How does your country respond to the impact of COVID-19 pandemic on TVET (e.g. curriculum delivery, modification of curriculum, online resources, educator competencies in online platform, assessment, accreditation)?
As you are well aware, Timor-Leste is a new country, as well as a resource-poor country. While TecVoc is very important, setting up a technical vocational school is extremely costly, both in terms of its infrastructure and equipment, as well as the challenge of recruiting suitable human resources. These challenges are compounded by the fact that technical-vocational training is constantly evolving as the world's technology rapidly advances.	TVET: A few potential solutions based on the challenges presented in question 1: 1) focus on technical-vocational areas that do not require much technological trappings for in-country training; 2) consolidate technical-vocational schools, in order to more efficiently use currently available human resource and infrastructure resources; 3) be more creative in finding specialized teachers for various vocational subjects who are highly regarded in their fields, but not required to undergo expensive teacher training courses; and 4) further develop partnerships with other countries, so that Timorese students may participate in educational exchanges, allowing them to be schooled in the most up-to-date technologies and with modern equipment.	**Enrollment** Schools in Timor-Leste were closed for face-to-face learning from the end of March until June, 2020. By the beginning of June re-opening standards were in place, and schools began opening. However, not all schools re-opened at the same time, as in order to re-open a 7 point list of requirements was instated, which included such things as mandatory tests for teachers and school leaders about prevention of COVID-19, water for daily cleaning and hand washing, mask wearing, etc. As some schools were not adequately prepared, they were certified for opening later than others. However, by August all schools were re-opened. In August the MEYS began collecting data regarding attendance (enrolment is not an issue as the school year runs from January until December, which means that enrolment was already done for the 2020 school year). As the data finalizes the MEYS will be able to share, but it would be safe to say that the majority of schools

		and teachers have returned. However, because of social distancing guidelines many students have been receiving far less hours of schooling than before the pandemic. The MEYS has been administering guidelines to help teachers use less face to face time in a more efficient way, but the results have yet to be seen. Currently the MEYS is compiling results of testing to determine how much learning was actually lost during the pandemic and subsequent reduction of school hours necessitated by social distancing upon recommencement of face to face learning.
		curriculum delivery This was touched upon above. Schools at all levels (from preschool until secondary) are facing different situations. Some classes are operating at normal hours, which means that curriculum delivery has been able to continue as normal. Others, however, have reduced hours, which could be at half hours, or in some schools with very large class sizes, even less. Schools have been given directives to move individual assignments done in class to homework, and in this way try to ensure that all content is covered both inside and outside of school walls. Teachers are encouraged to give students books to take home so that more reading can be done outside of school time, and the MEYS has also done a massive book distribution, as well as a recent procurement of more books to help this effort. Guidelines have also been set

		forth recommending for teachers to use alternative spaces within the school complex to allow continuation of learning during school hours, more effectively using space during social distancing, and employing peer-to-peer support to enhance student learning. Small group and individual tutoring sessions have been promoted more vigorously, and this will continue with more specific guidelines and support in the 2021 school year.
		modification of curriculum In general, the curriculum has not been modified, except with the following exceptions: 1. in classrooms with large class sizes that need to be divided by 3 or more groups (at all levels of schooling except for those students who take national exams), it has been recommended to concentrate on literacy and math subjects, potentially excluding other subjects but hopefully ensuring that basic skills continue to develop and improve. 2.For students subject to national exams, it was suggested to concentrate on the areas that are subject to national exams, in order to ensure that knowledge in the core subjects is developed. Schools in general are autonomous, so apart from these guidelines were free to modify curriculum in other ways as their individual circumstances demanded.
		online resources

		COVID-19, while devastating in many respects, also propelled the Ministry to quickly expand its availability of online resources. Through support from UNICEF, within a couple of weeks of the suspension of face-to-face learning, the Ministry had an online library created and a daily educational show airing on all major television channels and online through Facebook, Youtube and telecommunications company websites. MEYS was able to put online all digital resources, as well as some supplemental videos and audios, for most grade levels. The only exception was third cycle of basic education (grades 7-9), as the Ministry does not have the rights to these books. In this case, summaries were quickly made for each subject in grades 7-9 and put on the digital library. A list of other relevant online resources was also distributed to all schools. Local tele companies allowed free access and download of all Ministry materials until the end of the 2020 year. It should be noted that all materials produced by the MEYS are free and open source, available to anyone, but not for sale or profit.
		educator competencies in online platform Most educators in Timor-Leste had no experience with using online platforms before COVID-19. Therefore, the Ministry, through its National Teacher Training Institute (INFORDEPE) created and implemented several online courses for teachers. Most of these courses were how-to videos –

		how to use Zoom, how to use the Learning Passport, how to use Google Classroom, etc., but also included a pilot online training on child development for preschool teachers. The most widespread use of online platforms for teacher training was the Ministry mandated COVID-19 course, which was a mandatory requirement for ALL educators in Timor-Leste to pass in order for their schools to be able to re-open. This included all public, private and international school personnel, and the course and test was offered in three languages. Mentors were deployed across the country to assist teachers in registering and taking the course. In the end more than 17.000 people took and passed the course. It is hoped that this has started to sensitize educators to a future that will utilize online methods more substantially in teacher training, encompassing a wide range of teacher competencies. In general, while teachers were initially hesitant, they were very proud to have achieved a passing score from their online test, and particularly pleased that a certificate was generated automatically.
		Assessment Because of the time lost in school closures because of COVID-19, the MEYS delayed national exams for one month, giving students time to recuperate knowledge that was lost. It has been discussed that these exams not be the basis for passing this 2020 school year, as this would

		create discrimination (some schools were able to open in June, while others did not open until the end of August, allowing some children more time to prepare than others). However, this has not yet been decided officially. National exams are currently being corrected; therefore a reckoning of student success cannot be made until corrections are finished. In addition to regular assessments, the MEYS also created assessments to measure how much learning has been lost at different levels of schooling. The assessments focus on literacy and numeracy competencies and are a composite of different tests. Those that may be administered directly by the teacher have been completed already in some schools, and the data is currently being compiled. This testing, along with more centrally-administered assessments should be completed by February of 2021, which will also help the MEYS to develop more specific remedial programs where needed.
		Accreditation Accreditation was temporarily halted during the pandemic, as schools were closed. However, accreditation of schools continues now as usual.

United Nations
Educational, Scientific and
Cultural Organization