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TVET Agency-industry Collaborations: Addressing diversity

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Abstract

This paper highlights some of the initiatives undertaken by Malaysia in addressing social and economic challenges through TVET programmes in general and through TVET agency - industry collaborative efforts in particular. A brief description of the TVET programmes that are under the various agencies in Malaysia will be presented to be followed by examples of collaboration initiatives undertaken at the various levels of the TVET system. The issues and challenges encountered in their implementations are identified as factors that need to be addressed to ensure sustainability of future TVET collaborations.

1 Introduction

Addressing diversity has been at the core of the Malaysia Education System and is mandated in the National Education Master Plan 2006-2010 such that the development of the Malaysian Education System is to be based on four main thrusts that promotes education for all namely, access to education, equity in education, quality in education and efficiency and effectiveness of educational management (Ministry of Education, 2006). Measures to provide education for all includes enforcing the compulsory primary education policy in 2003 (Education Act 1996, 29A, 2006) and the fee-free schooling policy starting from 2008 as well as providing a wide choice of programmes that meets the needs of diverse learners.

Technical and vocational education and training (TVET) is a branch of education that has been introduced into the mainstream education system and transformed recently as part of the government initiatives to promote access, equity, quality of education which is ultimately aimed at providing the necessary local workforce who possess the necessary skills and competences for achieving the high income nation status by 2020 (Mohd Zain, 2008). The term TVET as used in Malaysia is synonymous with the term technical and vocational education as often used by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). As such, the definition of TVET is similar to the definition of TVE used by UNESCO which refers to "... those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life." (UNESCO, 2005, page 7). Also according to UNESCO (2005), the aspects that differentiates TVET from other forms of education and training is its emphasis on work productivity. In all TVET programmes, the emphasis on work productivity is always the main aim although and in some cases, can be the only aim of education and training.

One of the goals of TVET in Malaysia is to ensure that the learning needs of all its young people and adults are met through equitable access to appropriate learning and life skills programmes in line with one of the six goals of Education for All (EFA) in the Dakar Framework for Action established at the World Education Forum in Dakar, 2000. The regular academic stream in

secondary schools tends to favour learners with high mathematical, verbal and analytical skills and less so for learners who are more inclined to spatial and kinesthetic preferences. Thus the availability of TVET programmes in schools provides greater opportunities for diverse learners who are otherwise left behind in their middle education. The focus on vocation in TVET provides a pathway for those who have a strong inclination towards early vocational pursuits.

2 TVET providers and programmes in Malaysia

In Malaysia, TVET are provided under various ministries such as the Ministry of Education (MoE) providing TVET in schools; the Ministry of Higher Education (MoHE) providing TVET in polytechnics and community colleges as well as in some technical universities; the Ministry of Human Resource providing TVET in skills training institutes; the Ministry of Youth and Sports providing TVET in their National Youth Skills Institutes (Mohd Zain, 2008), the Ministry of Rural and Entrepreneurial Development and the Ministry of Women, Family and Community Development.

TVET agencies under the different ministries target different groups of participants and vocational sectors for their TVET programmes although they may sometimes overlap in their implementations. While the TVET programmes under the MoE and MoHE focus on further education and training for better career opportunities, TVET programmes under other ministries focus primarily on workforce productivity and the different agencies under these ministries provide different entry points of TVET access. For example, the Ministry of Youth and Sports provide programmes to prepare youth with basic TVET skills for their future life as well as for life-long learning and therefore their target group is between the age range of 18- 40. Notably, most of the participants in their TVET programmes are among unemployed youth. The Ministry of Women, Family and Community Development on the other hand focuses on programmes that provide basic household management and home science skills to teenagers and single parents. In contrast to the Ministry of Women, Family and Community Development, the programmes under the Ministry of Human Resource is not oriented to particular gender and is focused on preparing trainees to be skilled workers and their target groups are mostly school leavers.

In summary, there exist multiple ministries and agencies providing TVET to meet diverse needs of the people. In this short paper, only TVET programmes and collaborations that are undertaken by agencies that are directly under the MoE and the MoHE will be considered.

3 TVET under the Malaysian Education System

Since TVET is part of the education system in Malaysia, a brief description of the Malaysian Education system is here provided to better understand the provisions for TVET under the MoE and MoHE.

3.1 Malaysian Education System

The Malaysian education system is under the purview of two ministries as mentioned previously namely the MoE which is responsible for pre-school, primary and secondary education and the MoHE which is responsible for post-secondary education. Malaysians receive 12 years of schooling including one year of pre-school, six years of primary school and five years of secondary school as shown in Table 1. Primary education is compulsory on all children under the amended Education Act and was enforced starting from 2003 (Education Act 1996, Section 29A).

Students are assessed at different times in their schooling years to gauge their educational achievement. In their primary school, they sit for the standard examination; the *Ujian Penilaian Sekolah Rendah* (UPSR) in year six to assess their educational attainment after six years of primary education. The primary school leavers continue to obtain the three years of lower secondary education and sit for another standard examination, the *Penilaian Menengah Rendah* (PMR) in the

third year of their secondary education (Table 1). Their grades in the PMR are used for upper secondary education placement decisions. Under the Malaysian Education System, TVET is offered starting from the upper secondary education at the age of 16 onwards. In general, the MoE provide TVET programmes in schools while the MoHE provides TVET in community colleges, polytechnics and specialised technical universities.

Table 1 The Structure of the Education System in Malaysia

Level	Age	Duration (years)	Standard Examination
Pre-school	5+	1	
Primary school	6-12	6	UPSR
Lower secondary school	13-15	3	PMR
Upper secondary school	16-17	2	*SPM
Lower six	18	1	
Upper six	19	1	*STPM
Certificates & Diploma	18-21	2-3	
Tertiary education (MoHE)	20-	4/5 year prog.	

*SPM: Sijil Pelajaran Malaysia ('O' Level equivalent); used for selection towards Diploma programme
*STP: Sijil Tinggi Pelajaran Malaysia ('A' Level equivalent); used in selection towards Degree programmes

Out of the total population of primary school students, only 77% are enrolled into upper secondary education while the rest did not complete their 12 years of schooling (MoE, 2010) and TVET was part of the government initiatives to increase participations in the upper secondary education.

3.2 TVET programmes

As mentioned earlier, TVET programmes are offered under the MoE as well as the MoHE. Under the existing education system of the MoE, TVET is provided starting from the upper secondary education. However, a vocational transformation programme was recently approved where students were given the opportunity to enrol in TVET courses earlier. Fifteen secondary schools were offereing basics vocational education in as part of the pilot project in 2012. The vocational transformation programme also involves an introduction of a third stream – skills stream – in the upper secondary education level. Thus, three TVET streams are offered in the upper secondary school namely, technical stream, vocational stream and skills stream. Those who obtained excellent grades in their PMR are eligible to enroll in the technical stream programmes. The aim of the programmes is to prepare students for further education and to be future professionals. Those who get good results in their PMR can enroll in the vocational stream programmes. The programmes are aimed at preparing students for further education and to be semi-skilled professionals. Lastly, those who are not suited for the other two streams will be encouraged to enroll in the skills stream programmes that are designed to produce skilled workforce as well as to provide platform for further skills training in skills training institutes.

Compared to rest of the world, Malaysian enrolment in TVET programmes based on 2010 statistics is relatively low (approximately 15%) compared to the average of the Organization of Economic co-operation and Development (OECD) countries which is 44% (Fletcher, 2012). The low enrolment is a cause for concern and at the core of the vocational education transformation programme which focuses on efforts at increasing TVET enrolment in schools to address the diversity of learners (Speech by the Deputy Prime Minister on January 06, 2012 at the event for the launching of the vocational education transformation). Participations in TVET have been found to be associated with greater completion of secondary education in other countries (Yoo Jeung Joy Nam, 2009) and are expected resolve the high attritions rate in Malaysia (MoE, 2010). Greater provisions were made for further vocational education and skills training pathways.

The vocational education transformation plan is also undertaken to prepare the necessary workforce for supporting the country's economic transformation plan. Under the vocational

transformation programmes, students are exposed to vocational education earlier; from year 1 in their lower secondary education instead of from upper secondary school. The programmes are shown in Table 2. Upon completion of the lower secondary TVET education, students can further theirs studies in vocational colleges under the MoE, public skills training institute under the other ministries, or private skills training institutes.

Table 2 Structure of vocational education in lower secondary school (expected 5% participation)

Year of study	TVET qualifications
Year 3	❑ can continue in the course of their choice to get the Malaysian Skills certificate level 2
Year 2	❑ students can choose to enroll in a specific courses that will enable them to obtain the Malaysian Skills Certificate level 1
Year 1	❑ basics of vocational education, for those who do less well in their UPSR

3.3 Vocational colleges

Starting from 2012, 15 vocational schools were involved in a pilot project on vocational colleges. The programmes in vocational colleges are four year programmes offered to students who have completed the basic vocational education in their lower secondary education. The curriculum consists of a high practical component (70%) with 30% theoretical component. By 2013, all vocational schools will be transformed into vocational colleges (Utusan online, October 14, 2012). Upon completion of the vocational colleges programmes students are awarded the Skills Certificate Level 4 by the Skill Development under the Ministry of Human Resource. They will also be awarded the Diploma by the Ministry of Education. Successful graduates will also receive certifications from the relevent industries. The multiple recognitions means that graduates will have better job prospects. For those who wish to further theirs studies, they may enrol in higher TVET institutions under the various ministries as well as in private TVET higher institutions.

4 TVET under the MoHE

TVET programmes under the MoHE are offered in technical universities, polytechnics and community colleges. Graduates from these programmes are awarded Degrees, Advanced Diploma and Diploma in the various disciplines. The summary of the TVET programmes and the related awards under the MoHE and the MoE are shown in Table 3. To enhance post-secondary TVET the Polytechnic Transformation Plan was undertaken in 2010 (MoHE, 2010) where greater opportunities for pursuing higher education in TVET was created through the establishment of three premier polytechnics that are mandated to offer Advanced Diploma programmes in the related disciplines.

Table 3 TVET programmes and related awards under the Malaysian Education system

Ministry	Institutions	TVET programmes / awards
MoHE	❑ **Technical universities**	❑ 4- 5 year programmes / Degree ❑ 3 year programmes / Diploma
	❑ **Community colleges**	❑ Modular programmes /*Sijil Kolej Komuniti & Sijil Modular Kebangsaan*
	❑ **Polytechnics**	❑ 3 – 4 year programmes / Diploma & Advanced Diploma

Ministry	Institutions	TVET programmes / awards
MoE	❑ **Vocational colleges**	❑ Diploma programmes (National Skills Certificate Level 4
	❑ **Vocational schools**	❑ Vocational streams (National Skills Certificate 1 & 2) ❑ Malaysian Vocational Skills Certificate)
	❑ **Technical schools**	❑ Technical streams (SPM)
	❑ **Mainstream schools**	❑ Basics vocational education (National Skills Certificate 1&2)

5 Collaboration initiatives undertaken at the various levels of the TVET system

Collaboration initiatives are undertaken by TVET agencies for various reasons. Among the most emphasized collaboration objectives are; to improve research capacities and commercialization potentials (as undertaken by TVET institutions under the MoHE), to improve technical skills, to reduce demand and supply mismatch, to enhance employability skills, and to promote knowledge transfer between institutions and the community. The TVET agency-industry collaborations discussed in this paper are limited to those undertaken by agencies under the two ministries responsible for education in Malaysia namely the MoE and the MoHE. Table 4 gives a brief summary of some of the established collaboration programmes that are taking place that involves institutions under the two ministries.

Table 4 TVET agency-industry collaborative efforts

Ministry	Institutions	Collaboration initiatives
MoHE	**Technical Universities**	❑ Industry PhD ❑ Research , innovations and commercialization ❑ Industrial Training
	Polytechnics	❑ Internships programmes for students (industrial trainings), ❑ Industrial attachment for lecturers ❑ Guest lectureships
	Community colleges	❑ Work-Based learning
MoE	**Vocational Colleges**	❑ Traineeship programmes
	Vocational Schools	❑ Basics of financial management
	Mainstream schools	❑ Traineeship programmes

5.1 Industry PhD

The industry PhD programme which was launched in 2010 is a collaboration programme between the MoHE and industry. It is part of the existing MyBrain15 programme that targets 60,000 PhD holders by 2023 (MoHE (2011). The Industry PhD programme invites industry professionals to undertake industry-based research to promote innovations which will lead to increased

competitiveness of Malaysia. Five hundred Industry PhD grants are allocated in total with 100 participations targeted for 2011 (MoHE, 2011). For each industry PhD candidate, a maximum of RM50,000.00 has been allocated by the MoHE for supervision, tuition, training, examination, and thesis fees while the expenses for research activities are expected to be provided by the participating industry.

The implementation of the programme calls for a number of players to make it a success namely, a university representative, a human resource personnel from industry, industry staff who is supposed to undertake the PhD research and a representative from MoHE. In 2011, 97 industry PhD applications was approved, which was good in terms of starting the programme considering the target for 2011 was only 100 PhDs. The quick actions by universities in preparing guidelines for the implementations of the Industry PhD programmes have greatly expedited the process of the Industry PhD application.

However, several challenges were identified during the implementations that need to be addressed with regards to commitments and readiness of participants. Through informal discussions, candidates reported that they are often called upon to undertake added responsibilities that are not directly related to their PhD programme which undermines their capability to focus on their target research project. A possible cause of the situation is a lack of appreciations among employers on the need for high commitment by candidates in completing their planned research projects. The problem can be alleviated to a certain extent if universities have better understanding of the working of the industry that they are dealing with which would enable them to assist their PhD candidate in deciding on a viable and win-win research projects. There is also concern over a low number of applicants for the programmes which can be improved by having better promotional exercises to industries and better networking between academia and industries which will create better understanding of each other's needs that can be met through the industry PhD programmes.

5.2 Research, innovations and commercialization

Optimizing research capabilities has been one of the goals of collaborations in the higher education sector. Thus, the collaborators in such cases are mainly institutions of higher learning with some participation from research institutions and industries. In the institution-institution collaboration, sharing of resources such as research equipment and expertise are prevalent. Typical collaboration would be a research project being undertaken by technical experts from two or three universities. Recently, industry participations have been much encouraged in any research projects undertaken by universities. For example, in the case of the Malaysian Technical Universities Network Centre of Excellence grant scheme (MTUN CoE Research Grant scheme) each proposal for the application of the grant must include collaborators from industries in addition to the institutional collaborators. The institution-industry collaborations are expected to enhance research capabilities on both sides, improve productivity as well as increase commercialization potentials of products that are generated from the research projects.

In other words, while the institution-institution collaborations generally aim at increasing knowledge and human capital development, the institutions-industry collaborations have additional goals namely, to increase intellectual property rights, to promote problems solving in industries to increase productivity and to increase commercialization potentials of university research products.

To promote institution-industry collaborations, organizational support are provided via centre for research and centre for university-industry relations. As a consequence, many memorandums of understandings have been signed between institutions and industry as an indicator of willingness to collaborate but not as many activities have actually materialized. In general, the institution-institution collaboration has been found to be more successful compared to the institution industry collaborations. Several factors have been highlighted that contribute to the less prevalent occurrence of institution-industry collaborations on research and innovations but one has been most cited namely, the mismatch of emphasis where universities emphasize on knowledge acquisition and human capital development while industries tend to emphasize more on profit taking. A study

may be necessary to understand better ways of making this mode of collaborations more successful.

5.3 Industrial trainings and internships for students

Industrial trainings are collaborations between institutions of higher learning and industries to allow students to be attached in industries. These trainings are part of the pre-employment skills development process (using the three pillars skills development framework in Yoo Jeung Joy Nam, 2009). All undergraduates from technical programmes in universities and polytechnics have to undergo 3-6 months of industrial trainings in industries. To support the industrial training programmes, a large industry is a necessity. For example, in 2010 alone, 5000 companies were involved in the training 7800 community colleges students. While they are in industries, industries are expected to provide them with suitable tasks to prepare them for work as well as future learning. The expected outcomes are improved technical skills as well as soft skills.

The success of these collaborations in supporting learning experience depends highly on the suitable matches between students' area of studies and industry area. Students tend to prefer living near homes during industrial attachment period to reduce living costs and suitable industries may not be available at these locations. Some industries are reluctant to give challenging work to trainees resulting in students being "undertrained" technically and socially. Institutions are also facing a challenge in finding suitable industries.

In general the programmes have been rather successful as the number of students securing work after graduations as results of their trainings are quite high. Students coming back into universities or polytechnics after the industrial trainings often feel more confident in their ability to learn and to undertake vocational related tasks. Students feel that the industrial trainings do provide them with the "reality experience" that they can link to the theoretical knowledge that they are exposed to in Universities or polytechnics. Research indicates that these industrial trainings do improve students' soft skills as expected (Osman et al, 2008).

5.4 Work-Based learning programmes

The work-based learning programmes were first introduced in 2007 in four community colleges under the MoE via four programmes namely, hotel and catering, electrical technology, computer technology and automotive technology. Four industry sectors participated in the programmes namely, the automotive, the electrical electronics, computer technology and the hotel and catering sector. The main aim of the programmes is to promote soft skills, technical and vocational skills to enhance employability potential of graduates. The WBL curriculum were co-developed by the colleges and corresponding industries.

The programmes were found to be successful in terms of developing students' soft skills related to creative and critical thinking (Alias & Abd Hadi, 2011) as well as knowledge (Kamin, Cartledge and Simkin, 2010) and problem solving skills (Wan Mohamed & Omar, 2010). In addition to the WBL benefits to students', Kamin, Cartledge & Simkin (2010) also found that there are other benefits such as improved facilities through industry donations and improvement in teachers' knowledge and skills. Despite its potential benefits, the WBL has several hurdles to undertake, namely in terms of students' logistics. Sadly, the WBL programmes had to be kept on hold in 2010 due to change of stewardship when the MoE was split up into two ministries the MoE and the MoHE 2010, restructuring the existing management of the existing colleges under the MoHE where they were previously under the MoE.

Due to its past success, the WBL programmes will be resumed in 2013 (ref). However, past implementations have highlighted the areas that need to be looked into to increase the potential for WBL success. Among the issues, the most urgent is the one related to the welfare of the individual trainees who faced many logistical challenges during the WBL phase of their trainings. These difficulties can be resolved through better management of work placements as suggested by Kamin, Cartledge and Simkin, (2010).

5.5 Traineeship programmes

The traineeship programmes which represent school-industry collaboration were introduced into the vocational education system in 2012 and offered to those who are interested with consents from their parents. The programmes involve upper secondary school students working in industry two days a week as part of their pre-skills development process. The traineeship programmes are offered to students in the skills stream only. Several initiatives have been taken by the MoE as well as the individual school in ensuring the success of the traineeship programmes. For example, the MoE has signed a memorandum of understanding with Shell Malaysia whereby, Shell Malaysia will contribute US$32,000 annually over a period of five years to provide specialist welding training to students (Cicerello, 2012). In another successful example, an individual school the Kluang Vocational College has signed an agreement with Liebherr Appliances Sdn Bhd in Kluang to provide on the job training for students of the college. In addition to providing workshop facilities, training materials and products, the company is also adopting the college as a centre of excellence for training of its workers (Bahari, 2012). According to Bahari who is the principal of the college concerned, the company is committed to the extent that it is willing to make jobs available to the college graduates in 2015.

Despite some success stories, there are still hurdles to be overcome in implementing the traineeship programmes. First and foremost, decisions on the host industry to take in trainees from schools and colleges must be based upon consensus among school, industry and parents. The challenges in this case arise due to the lack of working policies in guiding the implementations of the traineeships. Thus, industry feels quite apprehensive to take these very young trainees (some maybe as young as 14 year old) into their workplace. Some industries, on the other hand are reluctant to accept students as they are yet to be skilled. Thus, to improve participations from industries, the government has improved the Human Resource Development Fund given to participating industries where industry can claim up to 100% of training related expenditure (Lembaga Pembangunan Pelaburan Malaysia, 2012).

5.6 Basics of financial management

Some knowledge of financial management is crucial in ensuring that students are able to manage their financial needs when they secure employment. Thus, to prepare students for the real working life, it is important that they are exposed to issues related to financial management. Aware of this need the MoE is collaborating with the Employee Provident Fund to raise awareness among vocational school students on rights and responsibilities of employees and employers. These programmes which will be officially launched next January in 15 vocational colleges are also designed to educate the Malaysian future workers on the importance of financial planning post-retirement even before entering the world of work (New straits Times, 2012)

6 Conclusion

Collaborations between TVET agencies and industries are occurring at the various levels of the education sector in Malaysia with pre-employment skills development as the main objective of collaborations across all levels of education while research and innovation serves as a second main objective in the higher TVET sectors. Benefits are observed on both sides although there are issues to be contend with in various forms. Issues related to the sustainability of the collaborations initiatives include continuity of governance, a better understanding of needs of multiple collaborators and ensuring commitments in collaborative programmes. Despite the challenges facing collaboration efforts, ensuring successful working collaborations is important as they are essential in meeting the diverse needs of the education and industry sectors. Successful collaborations can be achieved with the right environment and supportive organizational structure; a win-win partnership towards mutual benefits for both sides and the right people who are prepared to undertake new

responsibilities that collaborations often demand. Thus these are the factors that need to be addressed for ensuring future collaborative undertakings.

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