

The Importance of Green Skills - from the Perspective of TVET Lecturers and Teacher Trainees

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Education enhances sustainable development and improves humans' capacity to address environmental, social and economic issues. Green skills will help keep Malaysia ahead of environmental challenges and opportunities in a fast-changing global and political landscape. Further, one ACET 2015 agenda is integrating green skills to help the TVET program achieve sustainable development, by curbing poverty and developing the economy, for example. This paper discusses green skills for TVET teacher trainees, to develop environmental sustainability. Data was collected through online questionnaires of 111 (99%) teacher trainees and 38 (86%) lecturers. The questionnaire was developed and adapted from the Theory of Ecological Modernisation and Model of Sustainable Development. A basic descriptive statistic reported the findings from the analysis. They show fourteen applications of green skills for TVET teacher trainees that invite consideration. They should be integrated into the TVET curriculum, learning contents, teaching-learning processes, and reflected in any educational institute policies and practices.

Key words: *Sustainable Development, Green Skills; Teacher Trainee, Green Technology.*

Introduction

Green Skills Development challenges raise serious concerns for the welfare of current and future generations. Starting with a holistic approach to a green economy, green skills are needed. The European Centre for the Development of Vocational Training (CEDEFOP, 2014) defines green skills as skills needed in a low-carbon economy. They will be required in all sectors and at all levels in the workforce, as emerging economic activities create new (or renewed) occupations. Structural changes will realign sectors likely to decline as the

economy greens, and workers will need retraining. The successful transition to a low-carbon economy will only be possible if workers can adapt and transfer, from areas of decreasing employment to new industries (K.Jassal 2018; McCoy et al. 2012). In their research Jassal and McCoy stated that the green skills problem needs existing training and education programs, to help channel green skills training to construction workers. Research has uncovered many challenges to training for green jobs that exist in the green industry, as well as ways to overcome such challenges.

Green TVET is a term used by UNESCO-UNEVOC (2017) to introduce the element of sustainability into technical and vocational education. In achieving the success of Green TVET, three dimensions of sustainability requirements need to be addressed: the environment, economic, and social aspects (Egelund Holgaard et al., 2016). Thus, Malaysia launched in the year 2015, the 11th Malaysia Plan 2016-2020, an economic development blueprint for the next five years. It defined six strategic thrusts to help Malaysia achieve the target of becoming an advanced economy by the year 2020 in a resilient, “low carbon emissions”, resource efficient, and socially inclusive manner. Green skills are one of the strategic thrusts that will enable Malaysia to stay ahead of environmental challenges and opportunities in a fast-changing global and political landscape (Venkateswarlu et al. 2018). With that (ACET, 2015) drafts eight main agendas that empower the Educational with Technical and Vocational Exercise field, as contained in the Kuala Lumpur Declaration, as a preparation to fulfil job markets and capability to adapt to twenty-first century challenges. Of the four out of eight agendas in the declaration, one is to integrate greening skills for the preservation of the TVET program, to achieve sustainable development, including both curbing poverty and economic development (UNESCO & MOE, 2015).

According to Klaus-Dieter & Huyen (2016) in their report of Greening TVET in Vietnam, teachers have to be trained in regard to green issues through TVET. They must prepare teachers for green skills requirements. This is due to the lack of capable TVET teachers. This includes technical skills and knowledge, pedagogical components, workplace experiences and also relevant environmental knowledge. However, TVET teachers are required to teach and train others as to green skills, and to raise the environmental awareness of their students. Up to now, they have not prepared for these tasks and do not fully understand their mission. Therefore, Education for Sustainability is the approach that not only provides theoretical information to people about sustainability but also gives them practical tools, to move society towards sustainability. Theoretical knowledge may lead to mere conversations about the topic but not actually help people adopt sustainable practices in their daily lives (Anduanbessa, 2017; Widiastuti, et.al 2017).



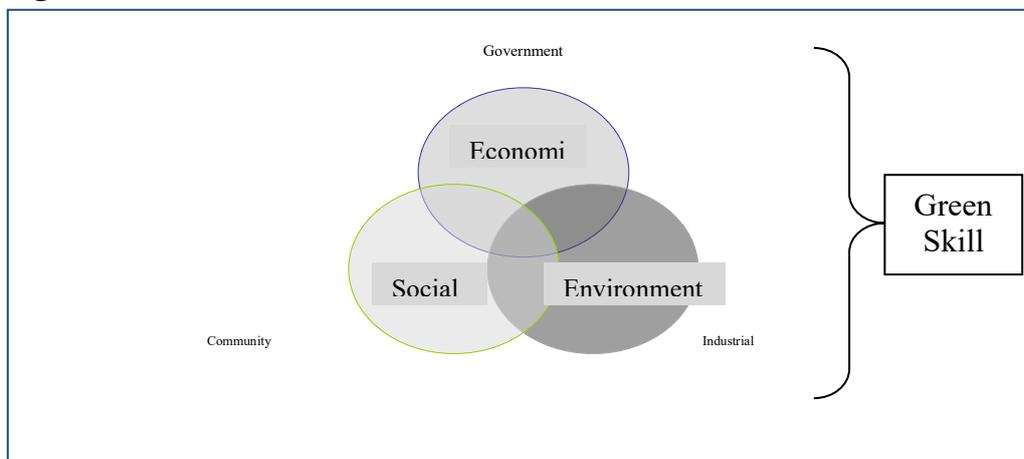
Implementation of the Sustainable School-An Environment Award Program will provide added value, to create a conducive and cheerful environment for teaching and learning process, as well as creating a community that loves the environment. The Sustainable School– Environment Award initiative is designed to recognise the achievements of primary and secondary schools in Malaysia in a particular year. It is based on five pillars of environmental related activities, namely the curriculum, the co-curriculum (extra-curricular), the school administration of environmental activities, the greening programs, and the special eco-projects (Alwi, Kamis & Rus 2017). The Award is a holistic and integrated approach, in that the program acts like an umbrella for all environment related activities organised by the schools. It can be implemented not only through teaching in the classroom but also through active student participation in extra-curricular activities in school. It is necessary to produce future generations who can inculcate values of environmental stewardship in every policy or action taken. Nevertheless, even after almost 13 years of green schools programs in Malaysia, its effectiveness among students is still not widely known (Yapin, Suhaidi & Esa, 2017). Environmental education embodied in the curriculum content was unable to produce the desired learning effect as specified by the Curriculum Development Centre. Studies have shown that only 30% are committed to the efforts of preservation and conservation of the environment, although the level of environmental awareness among the public is 90% (Karmilah Abdullah & Jamilah Ahmad, 2014; Wonyra, 2018). This issue indicates that many people are still less concerned about the importance of the relationship between development and environmental management (Nor Farahin et al., 2019).

Moreover, the analysis by the Ministry of Education to measure related green technology in pre-school, primary and secondary schools has found that the integration of green topics in the school curriculum is comprehensive, and should be updated according to the level and degree of understanding (Kerjasama Pintar, 2017). Among the topics is the green skill use for recycled materials in the syllabus of Design Technology (DT). Although elements of green skills are encouraged by the MOE teaching modules, this element is not used by teachers (Arasinah Kamis et al., 2017; Yang et al., 2016). This issue is also raised by the Curriculum Development Centre (1996) in which the study proved that teachers in schools only focus on finishing the syllabus and textbook content, due to time constraints. This led to neglecting greening of the school (Egelund Holgaard et al., 2016). Hence, this paper identifies the application of green skills during teaching and learning, since TVET and teachers play an important role in promoting Malaysia's sustainable development, by protecting and conserving the environmental, economic and social features of Malaysia.

Education Sustainable Developmental Model

Ecology Modernization Theory (Mol, Gert Spaargaren & Sonnenfeld, 2002), Social Development Theory (Midgley, 1996) and Model of Sustainable Development (Munasinghe, 2007) emphasise the holistic engagement of government, industrial and community. This ensures a preserved, sustainable development in the economy, community and society generally. Figure 1 shows the theoretical framework that combined the theory and model of sustainable development regarding green skills, in this research.

Figure 1. Theoretical Framework



The theory of ecological modernization has tried to capture the nature of the transformations outlined above (Mol, 1999). Ecological modernisation proposes that policies for economic development and environmental protection can be combined to synergistic effects, creating a positive-sum game between the economy and ecology. Rather than seeing environmental protection as a brake on growth, ecological modernisation promotes the application of stringent environmental policy as a positive influence on economic efficiency and technological innovation (Gouldson and Murphy, 1997). From the theory of ecological development that involves engagement between government, community and industrial sectors, models of sustainable development are increasingly used to address large scale environmental problems, ensuring that responses to present needs do not compromise the prospects of future generations.

Sustainable development must be integrated into education and education must be integrated into sustainable development. Education for Sustainable Development (ESD) is defined as education that encourages changes in knowledge, skills, values and attitudes to enable a more sustainable and equitable society. ESD aims to empower and equip current and future generations to meet needs, using a balanced and integrated approach to

the economic, social and environmental dimensions of sustainable development. ESD is holistic and transformational education, and concerns learning content and outcomes, pedagogy and the learning environment (UNESCO, 2014). ESD promotes the integration of critical sustainability issues into local and global contexts, in the curriculum, to prepare learners in understanding and responding to the changing world. Thus, the skills of sustainable development skills are known as green skills. The term refers to skills, knowledge, and attitudes needed by people to support and promote sustainable social and economic development, and to improve environment development friendly in business and communities.

Technical and Vocational and Education and Training (TVET) must play important roles in implementing and promoting sustainable development. TVET institutions are major suppliers of workforce who will be in the forefront in dealing directly with sustainability issues. Referring to the definition that sustainable development consists of three pillars: economic, socio-cultural, and environmental development, these should be considered as a whole. TVET policy and practices should not neglect any of the three (Institute for Sustainable TVET&Management Services n.d.). Neglecting economic development may mean that the initiative is unattractive for funding donors or investors. Ignoring environmental sustainability can be interpreted as that the initiatives may only focus on short-term benefits, and are irresponsible morally and socially. Excluding socio-cultural development cannot attract local people and may cause a loss of local identity (Paryono, 2017).

In summary, there are three main things to view in the theory of ecological modernisation:-

- i. Government - Policies and law enforcement, Environmental impact assessment (EIA), Green technology industry, Environmental education.
- ii. Industrial - Legal compliance, Green technology and eco-labelling, zero waste, Corporate Social Responsibility (CSR).
- iii. Community - Environmental awareness, participation in environmental programs, Supports eco-friendly products and Cultural education.

Purpose of Study

The study is to identify the application of green skills for TVET teacher trainees.

Methodology

This research was a descriptive study intended to assess the perspective of teacher trainees and lecturers, regarding the application of green skills. This study used a quantitative approach, distributing questionnaires to online respondents. The assessment is based on a quantitative approach using statistical procedures. Quantitative research can be done through descriptive studies or inferential (Chua, 2015). Chua (2015) stated that basic descriptive statistics such as frequency, percentage, mean, standard deviation and the distribution of scores were used to report the findings. In this study, data from the questionnaire were collected and the percentages were used to answer research questions. The population consisted of TVET teacher trainee and lecturer from Institute of Teacher Education in Malaysia. Of the 27 campuses, three offer TVET courses; the Institutes of Teacher Education at the Bainun Campus, Temenggong Ibrahim Campus, and Technical Education Campus. From the 112 teacher trainee intake June 2016 and 44 lecturers surveyed, 111 (99%) teacher trainees and 38 (86%) lecturers responded. This response rate was adequate being more than 30% (Nulty, 2008) for an online survey. A total of 14 questions was used and analysed. The questionnaire has been developed and adapted from the Theory of Ecological Modernisation and Model of Sustainable Development. The face validity of this instrument was carried out by two technical and vocational experts. The Guttman scale has been used to measure the dichotomous questions (Important/Not Important) that represent perspectives of teacher trainees and lecturers towards the application of green skills into TVET trainee teachers. Finally, basic descriptive statistics such as percentages were used to report the findings.

When interpreting the results of the present study, some limitations should be acknowledged. First, the data utilised in this study come from one source, i.e. the online survey questionnaires. Second, the sample for the study is limited to one cohort of TVET teacher trainees from the Institutes of Teacher Education at the Temenggong Ibrahim Campus, Tuanku Bainun Campus, and Technical Education Campus; future studies should sample larger cohorts including various Institute of Teacher Education in Malaysia. In addition the research should also extend to in-service teachers, for a more comprehensive outcome. Although the results cannot be generalised, the findings from this study can found further investigation into the application of green skills to the TVET curriculum.

Findings

Finding from the analysis shows that fourteen applications of green skills for TVET teacher trainee that merit consideration. Table 1 shows that the majority of TVET teacher trainees and lecturers (> 85%) have agreed that those items apply green skills, which should be

embedded in teaching and learning processes in Institutes of Teacher Education especially on the TVET field.

Table 1: The application of green skills for TVET teacher trainees found agreeable by the respondent

No.	Items	Percentage	
		Teacher trainee	Lecturer
1.	Integrating green skills into extra-curricular activities	100.0%	100%
2.	Integrating green skills into teaching and learning activities	99.1%	100%
3.	Choosing eco-friendly products	99.1%	100%
4.	Environmental law enforcement into educational institutions	99.1%	100%
5.	Environmental policies applied to curriculum TVET	99.1%	100%
6.	Environmental education across all subjects that related to Science and Technology	99.1%	92.1%
7.	Use of products that affect the environment	88.3%	92.1%
8.	Applying green technology in every subject of TVET	92.8%	92.1%
9.	Exposure to eco-label products	94.6%	100%
10.	The role of Corporate Social Responsibility (CSR-industry) in developing green technology and reducing environmental impact	97.3%	100%
11.	Awareness of protecting the environment applies to all educators	100.0%	100%
12.	Best practice for protecting environment amongst educator	99.1%	100%
13.	Participate Environmental program	96.4%	100%
14.	Support cultural education to foster an appreciation for the environment	97.3%	100%

Discussion

Findings from this study show that the majorities of teacher trainees and lecturers agree that the application of green skills into TVET curriculum are important, to achieve sustainable development. There were fourteen green skill applications, considered in the literature review as agreeable by all respondents in order of the following percentages: 1) Integrating green skills in extra-curricular activities; 2) Awareness of protecting the environment applies to all educators; 3) Integrating green skills in teaching and learning activities; 4) Choosing eco-friendly products; 5) Environmental law enforcement into educational institutions; 6) Environmental policies applied into curriculum TVET; 7) Best practice to protect environment amongst educator; 8) Support cultural education to foster an appreciation for the environment; 9) The role of Corporate Social Responsibility (CSR-industry) in developing green technology and to reduce environmental impact; 10) Environmental education across all subjects that related to Science and Technology; 11) Participate environmental program; 12) Exposure to eco-label products; 13) Applying green technology in every subject of TVET; and 14) Use of product that affect the environment.

Based on the research findings, the need to integrate green skills in extra-curricular activities, and to promote awareness of protecting the environment among all educators, should be considered most. This idea corresponds with the research findings of Yapin, Suhaidi & Esa (2017). Co-curricular activities can form and educate students and citizens as well as generate a knowledgeable, competent and holistic importance of an active and healthy lifestyle. Co-curricular activities complement the needs and requirements of the curriculum, where it provides a range of opportunities for students to add, measure and practice the learned skills, knowledge and values (Warman et al., 2017; Yoke,et.al 2018). Thus, extra-curricular activities in TVET play an important role in educating and developing green skill employees of the future. In addition, research findings by Arasinah et al. (2017) suggest that teachers have indirectly imparted to the students a knowledge of green skills through TVET subjects such as Life Skill. Material management and waste material re-use are among the skills appropriate for teaching in schools, because each individual needs to be wise in managing waste. These materials can be found in old projects or out-of-use products which can cut costs, as suggested by the Ministry of Education (2015). Besides that, the study of Setiawan (2017), based on the developed green skill framework, identified the acquisition of green skill in the Indonesian TVET curriculum. However, their study indicates that the development of green skills can be integrated into the curriculum. This is because in general, the curriculum is oriented to the development of hard skills and soft skills in the domain of knowledge, abilities, and attitudes, whereas green skill is an imparting of both. Thus, the development of green skill can be done through intra-curricular and extracurricular activities.

However, applying green technology in every subject of TVET is also important; even the percentages agree by respondent much less than others. The study by (Farahwahida et al. 2013; Wonyra, 2018; Nor Farahin et al. 2019) states that one of the examples of using green technology in everyday life, is when people try green practices as much as possible for even the easiest thing. For example, people can bring a bottle of drinking water from home rather than buying new bottled water. In addition, people are advised to use their own foodstuff to take food, instead of styrofoam or non-environmentally friendly plastic containers. It is important to encourage people to practice the green lifestyle effectively. Thus, the 'go green' concept can also be applied by using technologies such as combustion and compost that can help to reduce waste while reducing its use, by recycling where possible, and by composting kitchen waste to nourish the soil. Accordingly, in the study of TirusMuya Maina (2018), the regression analysis showed all Green Technology variables. In view of the findings, the study recommended that the government use TVET authority, education decision makers, planners and policymakers to develop a strategy for integrating green technologies in TVET under Green Technology Policy, Green Pedagogical readiness and Green Curriculum Content, to influence sustainable development in TVET institutions in Kenya. In view of the findings, the study recommended the government develop the strategy for a holistic approach for integrating green Technologies in TVET, through TVET authority, education decision makers, planners and policy makers.

Besides that, the use of products that affect the environment also needs serious consideration. The study of Alwi, Kamis & Rus (2017) explores the innovation of disseminating green skills through teaching and learning, to develop environmental sustainability. In their study, a respondent teacher recommended some green practices during cooking sessions, such as conserving water and reducing the use of non-recyclable materials. Students can adopt sustainable practices to conserve water, separate wastes and save electricity. When the infrastructure in schools is adequate and conducive to sustainable development, the impact will be viewed holistically (Shmis, Ambasz & Ustinova, 2019). This finding supports the suggestion by Mohd Zuhair Azuar (2015), which proposes a study of infrastructure and related equipment for the implementation of green technology in schools, and the results and recommendations be incorporated in the school curriculum. This will give students an avenue to practice green skills in the real world, one which revolves around their life activities. Stakeholders or the underlying body of education should play a supporting role, such as in the form of necessary equipment, in addition to giving knowledge solely for the success of education related to sustainable environment in schools (Mansell, Philbin & Konstantinou, 2019).

Green practices amongst educators involving habits and attitudes that can protect environment, are also agreeable to respondents. This is in line with a statement in the study of

Lee, Muhtar & Lai (2018), as to the concept of green practices such as vehicle sharing, energy saving and water resources, the reduction of the use of disposable items, and the use of green technology among students. These elements are based on National Green Technology Policy Pillars (KeTTHA et al. 2018) as follows:

- i. Energy - Seek to attain energy independence and promote efficient utilisation;
- ii. Environment - Conserve and minimise the impact on the environment;
- iii. Economy - Enhance the national economic development through the use of technology;
- iv. Social - Improve the quality of life for all.

In addition, according to Murga-Menoyo (2014), educators, teachers should be role models in shaping the future generations who will be able to appreciate life and the environment. We can live in a more sustainable environment if we become more aware of it, learning from nature, living with moderation and being active citizens in a developing environment.

Conclusions and Recommendations

Sustainable Development is the backbone of present and future economic development of the country. Realising the important roles of TVET in preparing future labour forces, and in tackling various economic, socio, and environmental issues, TVET has to play an important role in sustainable development. Otherwise, it will be too late to respond to the adversities that result from irresponsible practices. Sustainable development should be encouraged and proliferated in any TVET institution. Even better, TVET policymakers and practitioners can come up with other measures that are not only for TVET institutions but also for different organisations, different settings, and different levels of implementations, at the individual, family, institution, and other levels. These ideas should be integrated into TVET curriculums, learning content, teaching-learning processes, and also reflected in any institution policies and practices. TVET can be the source of inspiration for sustainable development. Thus, TVET is not only teaching education for sustainable development but practices, through its own policies and practices. Therefore, there is a need to apply green skills to the TVET teacher trainee, to contribute to global sustainable development. However, this paper focuses on TVET teacher trainees in Institutes of Teacher Education. It is imperative to focus on this institution since teacher trainees will share their knowledge and experience with students in primary schools. Therefore, green skills and green practices will develop from a young age.



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