

## Importance of Green Technology, Education for Sustainable Development (ESD) and Environmental Education for Students and Society

Nor Farahin Jasmi\*, Arasinah Kamis\*\*

\**(Department of Family & Consumer Science, Faculty of Technical & Vocational Education, Sultan Idris Education University, Malaysia)*

\*\**(Department of Family & Consumer Science, Faculty of Technical & Vocational Education, Sultan Idris Education University, Malaysia)*

*Corresponding Author : Nor Farahin Jasmi*

### ABSTRACT

Green technology can be seen as one of the elements that can minimize environmental quality degradation and provide a healthier environment. In addition, green technology is also important to be applied in the field of education to inculcate student's interest in appreciating the environment. Students can also practice the knowledge learned and disseminated to the community towards a more sustainable country. This concept paper aims to provide environmentally relevant information and sustainable development education (ESD) in line with the importance of green technology. This is due to the lack of awareness of environmental conservation and conservation among the community. Therefore, the awareness of environmental conservation should be nurtured since childhood as those who will change the next generation. Hence, the application of green technology as a sustainable development education driver (ESD) is expected to help address environmental issues. Additionally, Technical and Vocational Education and Training (TVET) can also play an important role in the greening of TVET greening that can be linked to green technology and ESD.

**Keywords** - Green Technology, Sustainable Development Education (ESD), Technical and Vocational Education and Training (TVET), Environmental Education

Date Of Submission: 24-01-2019

Date Of Acceptance: 08-02-2019

### I. INTRODUCTION

Green technology is the development and use of products, equipment and systems used to preserve the environment and resources, which reduces the negative impact of human activities (KeTTHA, 2017; Monu Bhardwaj & Neelam, 2015). Green Technology also includes groups with methods and materials obtained from techniques to generate energy for non-toxic products (Green Technology, 2015). According to Karmilah Abdullah & Jamilah Ahmad (2014), which states green technology is one of the alternatives to boost the national economy without affecting nature. This is in line with the study conducted by Farahwahida Mohd Yusof, Arieff Salleh Rosman, Salwa Mahmood, Siti Hajar Mat Sarip & Teh Ubaidah Noh (2013), which states that green technology is known as the clean technology is one of the elements of environmental science to preserve nature surrounding and natural resources to minimize the negative effects of human activities. According to Ruzian Markom and Norizan Hassan (2014), green technology is based on the importance of using environmentally friendly equipment and reducing carbon emissions. This is global warming and ozone

depletion can be reduced if carbon emissions are reduced.

Sustainable Development Education (ESD) is a creative education and can address the current and future global challenges by creating a more sustainable and resilient society. ESD is one of the quality education that is responsible for environmental integrity, economic viability and a society to shape the present and future generations. ESD is also a holistic education and transformation in dealing with learning content and pedagogy and learning in the environment (UNESCO, 2017). With the existence of ESD, through an interdisciplinary and holistic approach to learning, help create a resilient nature among the people. It also promotes long-term perspective in the decision-making process, critical thinking, holistic and innovative in problem solving. In addition, ESD also encourages every human being to acquire the necessary knowledge, skills, attitudes and values necessary to ensure a sustainable future (Devat S. Rathod, 2013).

## II. THE ISSUE OF GREEN TECHNOLOGY IN EDUCATION

The establishment of the Ministry of Energy, Green Technology and Water (KeTTHA) has transformed the green technology revolution in Malaysia from a very slow pace of progress to a better level. The Ministry also plays an important role in promoting green technology in all forms of development for the economic paradigm shift towards Vision 2020. Thus, the government has taken the initiative by conducting analysis of curriculum and curriculum related to green technology at pre-school, primary and secondary school (Siti Nor Syazwani, Mohd Safarin & Muhammad Sukri, 2012).

This is in line with the study of Farahwahida Mohd Yusof, *et al* (2013) states that one of the examples of using green technology in everyday life when people try to practice green practices as much as possible from the easiest thing. For example, practice by bringing a bottle of drinking water from home rather than buying new bottle water. In addition, people are advised to use their own foodstuff to take food instead of using styrofoam or non-environmentally friendly plastic containers. It is important to encourage the people to practice the green lifestyle effectively. Thus, the 'going green' concept can also be applied using technologies such as combustion and compost that can help to reduce waste while reducing its use, recycling of potentially recyclable materials and conducting composting of kitchen waste to nourish the soil.

In addition, according to R.B. Mustapha (2015) 'greening TVET' is a response to global issues related to sustainable development. It also aims to support the implementation of TVET to enhance sustainable development as UNESCO and the UNESCO-UNEVOC International Center have championed in the last decade. It is also a holistic framework and provides better opportunities for the TVET sector to support the transition of the world for more sustainable and low-carbon. Thus, climate change, lack of resources and the impact of globalization is one of the shifts towards the green paradigm. Therefore, TVET also needs to respond the challenges through the provision of green skills that can fulfill the needs of market demand and sustainable of social changes.

Moreover, according to Kai Gleissner (2012) review the concept of integrating TVET greening in the education curriculum. According to Kai Gleissner, TVET greening or "greening TVET" needs to develop a new TVET green curriculum. The curriculum needs to include existing subjects and practical training in job skills, including new skills, tasks and competencies. Greening TVET basically involves new green skills to provide new

green methods to develop new competencies in TVET. Malaysia is now beginning to realize the importance of education and training in support of human capital development efforts with high innovation knowledge and skills in technical and professional fields in improving economic productivity. Malaysia also has the potential to develop green technology and strive to step into the green industry experience which can benefit not only the country's economy but also support social and environmental sustainability. Malaysia has also taken a more drastic move towards green career (Green Career) to see the country's thriving and more green economy (Salina, Eza & Azman, 2015).

## III. THE ISSUE OF EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

Education for Sustainable Development (ESD) is a high education for all sectors including the kindergarten, primary, tertiary education and tertiary education sectors as well as non-formal education. In addition, schools are the models that play an important role in promoting changes in education for sustainable development. The life experiences of students and students need to be implemented in schools, including food-related issues, consumer education, social learning, energy use and personal resource management. Young people also can test and develop their own life skills and lifestyle (Reiner Mathar, 2013). According to Devat S. Rathod (2013), ESD aims to promote teaching that respects original and traditional knowledge and also promotes the use of native languages in education. Therefore, perspectives on sustainability need to be integrated into programs at all levels of education.

In addition, According to Margarita Pavlova (2013), the UNESCO report (2009) states that there is a relationship between Environmental Education (EE) namely Environmental Education and ESD. There are 3 types of connections between EE equivalent to ESD, EE is part of ESD and ESD and EE are different because they overlap each other but it is valid and necessary. According to R.B. Mustapha (2015) stated that TVET also plays a role in improving green development. Education and training to enhance the greening of the economy and companies should be applied to all levels of education. The basic education level should be started with an environmental education that plays an important role in creating awareness. Therefore, Palmer and Neal models (1994) are the ideal model for applying environmental education for students from the basic level.

#### IV. ENVIRONMENTAL EDUCATION

The model of Palmer and Neal (1994) emphasize that environmental education aims to create knowledge of nature and natural systems by using research activities as well as forming an understanding of the environment, environmental values and complex interactions of natural and human elements (Norhusna, 2014). Therefore, institutions such as schools are suitable to educate and forming attitudes towards the environment among students to become more useful human capital in the future more concerned with the preservation and conservation of the environment.

According to Arasinah, Ramlee, Norwaliza and Bushra Limuna (2016), the model of Palmer and Neal (1994) emphasize that environmental education can shape knowledge about nature in research activities. This model can also form an understanding of nature and environmental values. Therefore, green technology elements are expected to support social and environmental activities by applying environmental education approaches by adapting educational approaches in the model. In addition, traditional learning methods need to be modified so that it can enhance student knowledge of environmental care by encouraging them to carry out recycling the use of products as an effort to apply the green technology elements in them.

#### V. CONCLUSION

Most previous studies have found that lack of awareness on the community's knowledge of environmental issues. In addition, this can be seen after the environmentally-related education of sustainable development education (ESD) applied among the community, especially students, is expected to raise awareness on environmental care. In this case, green technology can also be applied in sustainable development education (ESD) as it involves the application of a product to safeguard and preserve the environment. In addition, TVET also plays an important role in implementing green technology and ESD in improving the skills of workers and learner and developing a sustainable country. Hence, environmental education-related models are best suited to students in line with sustainable development education as well as the application of green technology's elements to overcome the environmental issues. Thus, three aspects such as green technology, ESD and Environmental Education are interconnected because it involves the way to empower students and communities that preservation and conservation of the environment is crucial to reduce global warming. Therefore, the combination of these three aspects will trigger the idea of other researchers to be more interested in the field of green technology which is the driver of sustainable development education

(ESD) important for students and the community.

#### REFERENCES

- [1]. Arasinah Kamis, Ramlee Mustapha, Waliza, Abdul Wahab & Bushra Lamuna Hj Ismail (2016), Green Skills as an Added-Value Element in Producing Competent. *Int. Journal of Engineering Research and Application* , 12-21.
- [2]. Devat S. Rathod (2013). Education for Sustainable Development (ESD), *International Journal for Research in Education*, ISSN:2320-091X
- [3]. Farahwahida Mohd Yusof, Arieff Salleh Rosman, Salwa Mahmood, Siti Hajar Mat Sarip, Teh Ubaidah Noh (2013). Green Technology Management in the Muslim World, *Jurnal Teknologi*, ISSN 0127-9696
- [4]. Green Technology (2015). Green Technology-What is it?. Retrieved from <http://www.green-technology.org/what.htm>
- [5]. KeTTHA (Kementerian Tenaga, Teknologi Hijau dan Air) (2017). Dasar Teknologi Hijau Kebangsaan. Diperolehi daripada [http://www.kettha.gov.my/portal/index.php?r=kandungan/index&menu1\\_id=3&menu2\\_id=75&menu3\\_id=121#.WQK0gIWGPIU](http://www.kettha.gov.my/portal/index.php?r=kandungan/index&menu1_id=3&menu2_id=75&menu3_id=121#.WQK0gIWGPIU) pada 28 April 2017.
- [6]. Karmilah Abdullah & Jamilah Ahmad (2014). Impak Pemerkasaan Teknologi Hijau terhadap Amalan Pengamal Perhubungan Awam Hijau di Malaysian Green Technology Corporation (GreenTech Malaysia). *Akademika*, 84(3) 2014:29-39
- [7]. Margarita Pavlova (2013) Towards using transformative education as a benchmark for clarifying differences and similarities between Environmental Education and Education for Sustainable Development, *Environmental Education Research*, 19:5, 656-672, DOI:10.1080/13504622.2012.736476 Monu Bhardwaj & Neelam (2015). The Advantages and Disadvantages of Green Technology, *Journal of Basic and Applied Engineering Research*. p-ISSN: 2350- 0077; e-ISSN: 2350-0255
- [8]. Norhusna Mohamad (2014). Penglibatan dalam aktiviti kitar semula kertas terpakai dalam kalangan pelajar fakulti pendidikan teknikal dan vokasional, *Universiti Tun Hussein Onn Malaysia. Laporan Projek Ijazah Sarjana Pendidikan Teknik dan Vokasional*, Batu Pahat: Universiti Tun Hussein Onn Malaysia.
- [9]. Palmer, J. & Neal, P. (1994), *The Handbook of Environmental Education*, (London. Routledge).

- [10]. Reiner Mathar (2013). The concept of whole school approach – a platform for school development with focus on sustainable development. Retrieved from <http://esd-expert.net/assets/130314-Concept-paper-ESD-Whole-school-approach-general-introduction.pdf>
- [11]. R.B. Mustapha (2015). Green and Sustainable Development for TVET in Asia, *The International Journal of Technical and Vocational Education*. invotec XI:2 (2015) 133-142
- [12]. Ruzian Markom, and Norizan Hassan, Kelestarian Alam sekitar dan Pembiayaan Teknologi Hijau dari perspektif Undang-undang Syariah. Diperolehi daripada <http://jurnalkanun.dbp.my/wordpress/wpcontent/uploads/2014/11/7-Kelestarian-Alam-Sekitar1.pdf>, 2014, pada 20 April 2017.
- [13]. Siti Nor Syazwani Saibani , Mohd Safarin Nordin & Muhammad Sukri Saud (2012). Integrasi Teknologi Hijau Dalam Kurikulum Pendidikan Teknik Dan Vokasional (PTV), *Journal of Technical, Vocational & Engineering Education*, Volume 5 March 2012, Pages 11-19
- [14]. Salina M.Said, Eza Monzaid & Azman Hasan (2015). Pembangunan Model Kompetensi Kemahiran Hijau ke Arah Peningkatan Kompetensi Pensyarah Politeknik di Malaysia, *Journal of Global Business and Social Entrepreneurship (GBSE)*, Vol. 1: no. 2 (2015) page 109–117.
- [15]. United Nations Educational, Scientific and Cultural Organization (UNESCO) (2017). What is ESD?. Retrieved from <http://en.unesco.org/themes/education-sustainable-development/what-is-esd>
- [16]. United Nations Educational, Scientific and Cultural Organization (UNESCO) (2017). Education for Sustainable Development. Retrieved from <http://en.unesco.org/themes/education-sustainable-development>

Nor Farahin Jasmi" Importance of Green Technology, Education for Sustainable Development (ESD) and Environmental Education for Students and Society" *International Journal of Engineering Research and Applications (IJERA)*, vol. 9, no.2, 2019, pp 56-59