

# Exploring Green Skills: A Study on the Implementation of Green Skills among Secondary School Students

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## **Abstract**

Green skills are the technical skills, knowledge, values and attitudes needed in the workforce to develop and support sustainable social, economic and environmental outcomes in business, industry and the community (as defined by the Green Skills Agreement, Australia). School teachers play a role in producing skilled labor that has green skills. The aim of this research is to explore the views of teachers regarding the instilling of green skills in students and the types of green skills applicable in schools. This research is a qualitative investigation using the method of in-depth interview to collect information from the teachers who handle the subject of Living Skill Integration in secondary schools. The respondents opine that the school can disseminate preliminary information about green skills, but the application of these skills in real life requires experienced teachers. Furthermore, these skills can be infused into various subjects so that students can have a holistic perspective of sustainability. The respondents also state that the types of skills applicable in schools are recycling or material management, which will minimize the use of electricity and water. The applications of these green skills in schools are a real challenge to teachers, but they will encourage students to commit themselves to the good cause of environment. Therefore, all parties concerned must make a concerted effort to promote green skills so that students and the public are well aware of the importance of preserving the environment.

*Keywords:* Green Skills, Sustainable Environment, Awareness Of Environmental education

## **Abstract**

Kemahiran hijau merupakan satu kompetensi yang meliputi aspek yang menghubungkan seseorang dengan alam sekitar dan seseorang yang mampu mengabungkan pengetahuan dan kemahiran yang boleh menyumbang ke arah kelestarian kehidupan. Justeru itu, guru memainkan peranan bagi melahirkan tenaga mahir yang mempunyai kemahiran hijau. Kajian ini adalah untuk meneroka pandangan guru berkenaan dengan pemupukan kemahiran hijau di sekolah dan jenis-jenis kemahiran hijau yang boleh diaplikasikan di sekolah. Kajian ini menggunakan reka bentuk kajian kualitatif dengan menggunakan kaedah temu bual mendalam ke atas guru-guru yang mengajar subjek Kemahiran Hidup Bersepadu (KHB) di sekolah

menengah. Responden berpendapat bahawa kemahiran hijau ini boleh diaplikasikan di sekolah sebagai maklumat awal dan pengaplikasian kemahiran ini memerlukan guru yang mahir. Di samping itu, kemahiran ini boleh diselitkan dalam setiap mata pelajaran dan meliputi aspek kepelbagaian pelajar. Responden juga menyatakan beberapa jenis kemahiran hijau yang boleh diaplikasikan di sekolah iaitu dengan menggunakan semula bahan atau pengurusan bahan, meminimakan tenaga elektrik dan air. Pengaplikasian kemahiran hijau di sekolah adalah merupakan salah satu cabaran kepada guru-guru, namun, ia masih boleh dipupuk dalam kalangan pelajar. Oleh itu, semua pihak perlu bekerjasama dalam mempromosikan kemahiran hijau agar dapat memberikan kesedaran kepada pelajar mahupun kepada masyarakat umum akan kepentingannya.

*Kata kunci:* Kemahiran hijau, persekitaran kelestarian, pendidikan kesedaran persekitaran

## **1.0 INTRODUCTION**

Nowadays, people talk about green elements which include green economy, green development, green communities, green urbanization, green education and others related to sustainability. To establish a sustainable life, every individual should have the love for the environment. Impartation of green skills to students needs to be done from a very young age to ensure that the human capital and leaders of the country have the right attitude towards, and awareness of the importance of balanced environmental developments in all aspects of life. Environmental learning was first introduced in the education system because of concerns for the environment and to develop it in a sustainable manner. It also aims to develop the awareness, skills, knowledge, attitudes, values, understandings and commitment, which hopefully will help solve environmental problems in order to achieve a better quality of the environment (Sola, 2014). As noted in the 4<sup>th</sup> strategy of the 11th RMK, it is important to nurture the culture of green technology among students of all levels through the development of an effective curriculum. Based on the report of the study of 21 developed countries by Strieska-Illina, Haro and Jeon (2011) it is advantageous to implement green skills training, in formal or informal education because there is a high demand for these skills in the development of a green economy. For example, the Council of the Australian Government (COAG), in November 2009, entered into the Green Skills Agreement (GSA), an agreement made by the Australian Government in collaboration with employers, industry and community organizations. With the execution of this agreement, training in the development of green skills is deemed necessary in the education system; this green element is particularly important in technical and vocational training, the graduates of which are required in the industry (McDonald, Condon & Riordan, 2012; Bushra Limuna, Arasinah, Che Ghani, Kiong, & Md. Bekri, 2016).

Therefore, the Malaysian Ministry of Education conducted an analysis on the syllabus and curriculum related to green technology in pre-school programs, primary and secondary schools. The results of the analysis show that the integration of green topics is not exhaustive and should be updated according to the level and degree of understanding (Siti Nor Syazwani,

Mohd Safarin, & Muhammad Sukri, 2012). At the same time, the majority of courses offered in technical vocational education and training (TVET) do not contain training (Jahonga, Ngore & Muramba, 2015; Satesh, Mohammad Hosseini, Ramakrishna, M. Al-Atabi & Melani, 2017) in green technology (GT). In contrast, the Australian government recognizes the "green program" of the non-governmental organizations, in which the students are given support when they leave school; they are able to develop environmental values that they can apply in the society. These NGOs also provide a training certificate that has been accredited and can be used to find a job (Steplight, 2011). The government has changed the policy in the development of renewable energy and industrial growth related to green technology and green skills. Many other countries have also made green technology as the basis for sustainable development and sustainability of disposable energy (Arasinah, Ramlee, Waliza & Bushra, 2016; Bushra Limuna, 2016; Carbonel, Adora & Agbisit, 2015; Mc Donald, Condon, & Riordan, 2012).

Besides, in the current education system, the component of green skills or green technology already exists in the environmental education-- the subjects related to nature and humans (PAS) which have been introduced since 1986 to students in phase 2 (years 4, 5 and 6) in primary schools. Beginning in 1998, the curriculum containing PAS has been formally introduced in almost all subjects in the primary and secondary schools (Nurul Hidayah, Haryati & Seow, 2013). This component is a field study of human interactions with the environment and how people should manage the environment responsibly for the welfare of humankind (Ministry of Education, 2001). Although PAS has long been introduced, its effectiveness is still not fully shown, and goals set are yet to be achieved. Despite the fact that environmental education has been carried out through many subjects for a long time, environmental awareness is still at a low level (Jamilah & Hasrina, 2011; Kennedy & Chow, 2013; Shahrom, Noor Ezlin, Fatimah, Othman & Hassan, 2015). Meanwhile, the practice of sustainability or skills in implementing elements of the environment among students is still at a level; this is probably because of the lack of exposure to green skills education (Carbonel et al., 2015); Hanifah, Yazid, Mohd & Nasir, 2016). In addition, it was found that teachers' awareness and environmentally responsible behaviors are at a moderate level (Daban & Kahyaoğlu, 2013; Arunkumar, 2012); Kennedy and Chow (2013). Teachers should be the people to have a high level of awareness compared with other people or groups of people (Arunkumar, 2012). Therefore, the primary objective of this study is to explore the views of teachers in relation to these matters: 1) What are the views of teachers toward nurturing of green skills in school? 2) What are the types of green skills appropriate to be applied in schools?

## **2.0 GREEN SKILLS**

"Green Skills" are skills that must exist in every human group that undertakes all areas of work in an organization in this century. This is in line with the statement of Buntat and Othman (2012) which says that green skills, also known as Green Soft Skills, are to complement Green Jobs and Green Career. *Missouri Economic Research and Information Centre* (2009) touched on this matter; a report known as the *Missouri Green Jobs Report* has identified that the

effectiveness of self-competence (Personal effectiveness competencies) is one of the branches of green skills. The report adds that these competencies are fundamental ways of life to suit all types of work in any organization across all areas of work and industry. CEDEFOP (2012) also gives a definition of green skills as knowledge, skills, values and attitudes necessary for life in societal development, and support the creation of a sustainable and efficient resource management. Green skills are needed by all sectors-- education, construction, industry and at all levels of the working force. According to the preliminary study by Goldney, Murphy, Fien and Kent (2007) the community now has some degree of awareness towards the environment and recognizes that education plays an important role in nurturing green skills among students.

Meanwhile, in *Australia, the Council of Australian Governments* (2008) has developed a policy in the Green Skills Agreement, which certifies that green skills are technical skills, knowledge, values and attitudes needed in the workforce to develop and support the development of social, economic and environmental revenue in business, industry and society (Hamid, Yusri, Azlan, Yahya, & Zubaidah, 2016; Brown, 2013). This will ensure the sustainability of skills development for TVET and higher education. The agreement will empower educational institutions to generate high quality TVET graduates in terms of knowledge and skills for sustainable development; and will ensure the products available in the market are responsive to the needs of the industry. In order to safeguard the objectives of the Green Skills Agreement, the Australian government has provided a framework for the development of green skills in the TVET sector. The plan is to align the efforts of all parties, allow the identification and sharing of best practices, and help avoid duplication and waste of natural resources that can be used. Meanwhile, the study of Vona, Marin, Consoli and Popp (2015) found that green skills are a set of competencies related to the design, production, and management and monitoring of technology. This study also found that environmental regulations trigger changes in technology and cause organizations to increase the demand for high-level analytical and technical skills. Green competence can be divided into two categories, namely *visible* and *covert* (hidden) competence (Mohd Sharil, Azman & Ruslina, 2015). Apparent competence is called *hard green competency* and sheltered competence is called *soft green competency*.

Green Competence is a competence that includes these aspects: connecting one person to another, one with the nature, other people with himself or herself, the meaning of life with the divine being; and someone who is able to combine the knowledge and skills that can contribute to the preservation of the environment (Mohd Sharil et al., 2015). Therefore, development of green skills is essential for the transition of a conventional economy to a green economy. As stated by the OECD (2014), green skills are also known as technical skills, values and attitudes needed in the workplace. Similarly, the International Labor Organization (ILO) and CEDEFOP (2012) have launched a research project to investigate the necessary skills such as organizational structure, which will support different establishments undergoing changes to a green economy. The concept of green skills is not given as much attention (CEDEFOP, 2012) as the field of TVET, which will produce skilled manpower and preservation agents.

### **3.0 NURTURING OF GREEN SKILLS IN SCHOOLS**

#### **As initial information**

Hayward (2012) found that children in primary schools are taught to understand and act according to the principles related to environmental and social issues. Children are sustainability or catalytic agents who will inherit the environment and engage with families and the community; therefore, they should be exposed to the skills of environmental sustainability (Stuhmcke, 2012). Green skills and other elements are needed to produce students who are competent. Therefore, green skills ought to be included in the school curriculum (Arasinah et al., 2016). Meanwhile, based on the fourth strategy of the 11th Malaysia Plan (RMK), the culture of green technology should be encouraged among students; this is a necessary initial step for each level of education through the development of a more effective syllabus. Accordingly, it is appropriate to instill green skills and green technologies in primary school students first, before they move on to secondary schools. When these students, inculcated with green elements, progress to a higher level of education, they will be able to apply what they have learned to activities and processes that will produce a green product. They can apply their skills and knowledge before taking into account the aspects of green growth (Coljin, 2014; Fien & Guevara, 2013; KPM, 2011). Green skills and knowledge are required for green jobs; they are also required to develop a green economy, including public awareness about the environmental issues and sustainable development of the country (Asnawi & Djatmiko, 2016). Unfortunately, there are students who are not aware of the issues related to the environment due to a lack of education regarding the environment. In addition, there is a shortage of media or public forums that play the role of educating the students (Carbonel et al., 2015).

#### **Teachers need to be equipped with green skills**

Teachers should be smart in setting teaching strategies to motivate students to learn green skills. Teachers can use a little positive emotion to encourage students in producing materials. All these efforts can attract students to be part of the green talent movement (McCoy, O'Brien, Novak, & Cavell, 2012). The Government's efforts to implement green technology should be viewed from the perspective of two innovational components: the design process and development of green technology. School students are taught and encouraged to create something: design and produce simple products that are environmentally friendly and practical for our country. At a higher level however, we can develop technology that is able to produce useful articles without wasting resources such as electrical energy and water. The new eco-friendly designs must be practical that can be commercialized for local and export purposes (Arasinah et al., 2016). Meanwhile, a study by Arunkumar (2012); Nagra and Kaur (2014) found that some teachers still have a low level of green skills and lack awareness of the importance of protecting the environment. They need a lot of training in these skills in order to be competent in developing a green economy (Jahonga et al., 2015; Majumdar, 2011). Teachers should be aware of the concept of environmental education, the problems and ways to overcome them. Teachers can then apply the knowledge to train students in conserving the natural environment (Nagra & Kaur, 2014; Nagra, 2010). The study by Kennedy and Chow (2013) found that teachers

in Asia (China, Thailand, Korea and Indonesia) have less confidence in teaching topics about the environment.

### **Can be interlude in every subject/topic**

In a study conducted by Hanifa et al., (2014) with respect to sustainable development under the Sustainable School Environment Award program, the involvement of students in this program is seen to be a positive start in spreading the knowledge about the educational concept of sustainability (Education for Sustainable development, ESD). Hence, the concept of green skills needs to be introduced across the board in Malaysia. Suhaimi, Mahmud, Muhamad Ariff, Hamzah and Saud (2010); Ramlee (2015) stresses that the preservation of the curriculum in technical and vocational education (TVE) plays an important role in addressing the development challenges in this booming country. Pavlova and Huang (2013), examines the type of values that can be applied in education, technical and vocational training skills to deliver green skills agenda. The value to be applied in green skills is love which encompasses the following: doing no damage to the soil and water, holding on to science, hard work, unity and mutual assistance, honesty and trustworthiness, being disciplined and law-abiding despite turmoil, and understanding the simple life and striving for it. Lethoko (2014) examined the relationships between the government policy of the green economy, education and training; the aim was to determine how the educational sector responded to the green economy in South America. Based on the study, it is found that green economy can affect proficiency in three forms, namely bringing back green development, developing green technology and creating green skills among workers. At the same time, the industry's demand for skilled workers increases, but the supply of skilled labor in the market is still lagging behind. This is because there are various barriers to or unresolved issues in the implementing of green skills. According to the study of McCoy, O'Brien, Novak and Cavell (2012); Ramlee (2015); Asnawi and Djatmiko (2016) issues regarding green skills need to be resolved through education and training programs, which help deliver green skills training for workers in the construction field effectively. Meanwhile, Jagannathan (2013) suggests that education and training should focus on the skills, education and training needed by the entire spectrum of the greening of the economy and society. Scientific and technical skills are needed in the context of reducing pollution, creating cities, transportation systems, and comfortable habitats that produce low carbon. The study also states that the most important aspect is to ensure education and training systems become more innovative and far-sighted. Asnawi and Djatmiko (2016) noted the importance of providing for the needs of the professional green workers, who play an important role in influencing the creation of a sustainable and resilient community. Education is needed to develop a new training curriculum and launch green business promotion campaigns. Thus, the availability of technical and vocational training will be critical to building basic foundation skills of workers needed for green jobs (Razeman, 2011; Strietska-Ilina et al., 2011; Ramlee (2015).

### **Diversity of the students**

As seen, students are sensitized to and aware of environmental issues, but it is very difficult for them to put the head knowledge into practice. Saravanan, Rosta and Ahmad (2013) carried out a study attempting to identify aspects related to sustainable consumption practices among students in Johor, Malaysia; the author found the practice of sustainable use of students are at a moderate level. He associates it with a lack of sustainable consumption practices in everyday life, and there are many students who have yet to adopt sustainable use practices to reduce environmental problems. In fact, he also found no significant difference between students in urban and rural areas in terms of adopting sustainable consumption practices. A sustainable practice is expertise in implementing environmental elements, but it is found the application of this practice is still at a low level (Hanifah et al., 2014). A study conducted by Kennedy and Chow (2013) covered many countries of Western Asia, namely Hong Kong, Chinese Taipei, the Republic of Korea and South Africa, Thailand and Indonesia. The study found that schools play an important role in enhancing the understanding of the environment. It is a key value that has the potential to affect not only knowledge but also attitudes and actions of a person. The study also found that there are issues in the implementation of these green skills in schools, whether the school is able to be proactive in supporting students to be bound by related personal and social agenda, which are associated with the future community. Findings of this study show that while environmental education is incorporated in the school curriculum for most students in selected countries, the results are not the same and the opportunity for students to know about the real environmental problems are not the same in the area. The result is dictated only by the potential of the students to receive the teachings. Mukoni (2013) and Sola (2014) found that knowledge of environmental education transmitted to students through the school curriculum does not make a difference to the community, students and teachers. Hence, the role of technical and vocational education in the delivery of green skills and green technologies is essential in instilling love for the nature. According to Meenakshi and Leela (2014), education has the power to put the responsibility of formulating sustainable environment education on the future generation without focusing on new policies.

## **4.0 THE TYPES OF APPROPRIATE GREEN SKILLS TO BE APPLIED IN SCHOOL**

### **Reuse of materials and Material management**

Students are encouraged to use recycled materials and recyclable materials such as rattan, bamboo, boxes, plastic bottles, shells, wood parings and scrap plastic pipe while conducting educational activities. The use of materials not needed will save costs and inculcate thriftiness as well as innovation when students do a project. This way, students will be more aware of the usefulness of the available resources around them and are able to utilize them in various creative ways (KPM: MOE, 2015). Therefore, knowledge and practices concerning the recycling of used materials is important and needs to be nurtured in students, especially in the subjects of RBT. Recycling out-of-use materials can conserve the environment and help people apply green practices in daily lives. Green skills topics that are in line with green technology should be included in the curriculum and taught as early as possible to pupils at school levels, so that the

knowledge will be deeply entrenched in their minds (Brown, 2013; Cedefop, 2014; Mohd Zuhair, 2015). It is the government's aim to produce highly skilled human capital and at the same time be able to maintain sustainable growth and green technology (Strietska-Ilia et al., 2011; Mass, Moss, Hopkins & Ross, 2010). Meanwhile, Pan, Cotton & Murray (2012); McDonough, Braungart and Clinton (2013) describe recycling as "not simply the conservation of resources that went into the production of certain ingredients, but add value contained in it". By using the skills and knowledge, we will be able to carry out redesigned invention. Therefore, if individuals can add value--economic, intellectual, emotional and material of a product through the process of reuse, it can be called 'upcycled'. Communities are encouraged to adopt green practices as a lifestyle (Sabri & Yong, 2006; Sola, 2014). The government has undertaken a number of initiatives and offered incentives to the public regarding green practices such as using their own containers when buying food and avoiding the use of Styrofoam or plastic containers that are not environmentally friendly (Carbonel et al., 2015). Women show more concern for environmental problems by engaging in activities that protect the environment such as turning off lights to save electricity, cleaning the surrounding environment, planting trees, conserving water and separating trash (Raudsepp, 2001; Ifegbesan, 2010). Also, they bring their own bags when they go shopping.

#### **Minimize the use of electricity and water**

Users should give priority to the purchase of energy-efficient electrical equipment by using energy-efficient lighting. It will save energy even though the the energy efficient appliances are more expensive than conventional equipment. However, much energy is saved, and this will lessen the adverse effects on the environment (Abd Rahman, Masdar, Rosli, Majlan, Husaini, Daud, Md Rejab, Lye, 2016). The findings of the interviews conducted by Stauffer, Zahrer and Lechner (2012) show that the degree of readiness of teachers to practice sustainable development is low. In fact, teachers place less emphasis on sustainable development, even though the topic is available in the school curriculum. The implementation of growth in green technologies will reduce energy consumption, and the saved energy can be used for other purpose (Torbay, 2015). The green growth strategy can improve the quality of growth, strengthen food supply, and save water and energy while reducing environmental risks and ecological destruction. This strategy will raise the quality and standard of living when it can reduce greenhouse gas emissions and conserve ecosystems (Razeman, 2011; Mohd Khairul, 2006; Sola, 2014). Sustainable use and practices can manage the efficient use of energy, and this will reduce the carbon footprints of buildings, transport, products and services (Dalia, 2009). Defra (2008) reports that skills-intensive research has been conducted; the aim is to identify the skills needed for the low-carbon green jobs available in the industry's future. This includes designing skills (eco-design and green manufacture); waste (management and mitigation); energy (reduction and reuse, carbon trading and technology regeneration); water (management and recycling); building (energy management and efficient construction ); transport (impact of reduction and fuel vehicles); materials (low-power design and efficient processes); finance (financial investments model, carbon and emissions trading); management



(resource efficiency and cost-benefit analysis); and policy and planning (assessment impact and planning) (Amarumi, Arasinah, Haryati, Faizal Amin, Ridzwan, 2016).

Brown (2013) studied the perception of 4 types of cohorts available in Australia TAFE institutes on the development of green skills. The four types of cohorts are representative of the community or industry, managers at TAFE, TAFE teachers, and students at TAFE. This study shows that most of the respondents are optimistic about these green skills. However, there are also risks that may be encountered. There are some jobs that will be created and grow by the many changes that will occur in terms of employment and skills application. Market segments clearly growing are those in renewable energy, energy saving, water system sustainability, green building and recycling sectors. Each career or job begins to consider and implement skill sustainability. Respective studies by Carbonel et al., (2015) and Sola (2014) found that there are various remedial measures that can be implemented by the government to raise the public awareness of the environment: encourage the development of green urban areas; increase promotion of clean and highly efficient vehicles; and enhance the promotion of conservation of technological energy.

#### **4.0 RESEARCH METHODOLOGY**

This research utilized the qualitative case study approach. A case study to describes, and analyzes a phenomenon or a social unit as a group. Purpose sampling was applied to select the respondents. Researchers have identified who can and have a lot of information that coincides with a phenomenon as interest (Merriam, 2009). A total of 15 teachers of the Life Skills subject in secondary schools were interviewed. The selection of respondents was based on their own abilities and their own willingness in providing the information needed to answer the research questions (Creswel, 2012). The selected respondents have more than 15 years teaching experience in Life Skills subject and have qualification in the same field. The individual interview method was carried out twice in order to obtain information regarding the opinions or experiences of the teachers. In-depth interviews were conducted with semi-structured questions. One of the advantages of semi-structured questions is the flexibility to add in more questions to obtain relevant data. Although the interview questions were outlined initially, the answers are open and can be developed further according to the need of the interviewer and the backgrounds of the respondents. The interviews were recorded using a voice recorder. The researcher used a few strategies to determine the validity and reliability of the qualitative data such as using the local language which is Malay in the interview sessions. To raise the accuracy of data collection, the interviews were conducted using the local language or a common language of the local community. This is intended to manage the problem of meaning-making when the content of conversation is translated to other languages (Noraini, 2010). Lincoln and Guba (1985); Merriam (2009); Seale (2002) emphasize the issues of validity and reliability in qualitative research such as trustworthiness. As stated by Cohen, Manion, and Morrison, (2007); Merriam (2009), internal and external validity and reliability can be determined through various methods such as triangulation, member checks and peer check. The researcher repeated the interviews for each respondent to increase the degree of reliability. The

researcher also used the method of audit trail, which means the researcher examined specifically the methods, procedures, processes and research results or products in order to determine the consistency. The researcher also used the method of member check, through which the researcher communicated with the respondents; this is to check the validity of data interpretation of interviewing process--whether they agree or disagree (Seale, 2002). Member checks were done to validate the information and increase its accuracy, creditability, conformability and transferability.

## **5.0 RESEARCH FINDINGS**

Based on the research findings, all the expectations raised by the respondents show that nurturing green skills in schools are from four aspects which are knowledge of these skills is appropriate as initial information for the students; the teachers need to be equipped with green skills; teaching of these skills can be inserted in each subject/topic; and diversity of the students to receive the knowledge. Besides that, the respondents teach certain aspects of green skills to the students such as reuse of materials and material management; and minimizing the use of electricity and water. Therefore, the practice and development of green skills are needed for future green jobs in the industry and need to be applied in school.

### **Research Question 1: What are the views of the teachers toward nurturing of green skills in schools?**

The teachers' views of nurturing green skills in schools are from four aspects: 1) as initial information for the students; 2) the teachers need to be equipped with green skills; 3) can be interlude in every subject/topic; 4) diversity of the students.

#### **As initial information**

*"Fostering these skills in schools, for me, it is an appropriate thing to be implemented because we need to foster these good values. Starting from the schools, I mean from the early stages of school. It should start from the early stages so that these skills will become a practice at a higher level later on." (R1)*

*"...because exposure is needed from the early stages, because we accept easily during early stages. We need to 'bend the bamboo from the shoot' right? If we start at higher stage, maybe the acceptance will be delayed right?" (R2)*

*"...that is why we need to start from the basics. It will become the basics for the students when they grow up and it will have an effect on them. It will have an effect on the nation in the long run. These skills need to be stated from the bottom; then. we can see the effect on the nation." (R4)*

*"Supposedly, this thing should not only be started with students in the primary school; we should continue this through the secondary school also. It should also be infused in other subjects related to environment." (R3)*

#### **Teachers need to be equipped with green skills**

*"... Form 3 students need to design, thus the teachers need to have the mentioned green skills in order to guide the students regarding the materials that they can use for their projects." (R7)*

*"...very good, if the teachers understand and have the skills, they can explain more clearly so that the students can master this aspect of skills in depth." (R5)*

*"...not all the teachers know and are proficient in these skills, so if the teachers have these skills, it would be good. It would be easier for them to teach or apply on the students and to manage these green skills." (R8)*

*"...there are teachers who still don't understand these skills, because these skills are not easy, we have to observe, need to study it, need to practice, implement and observe everything first right, need to research first, then only will become familiar right?" (R11)*

### **Can be interlude in every subject/topic**

*"...only that these skills are not explained well, that these are green skills. These skills are being taught indirectly, there are teachers who teach across the curriculum." (R4)*

*"...can only be implemented as interludes, we can't implement further, even in the exam questions. Therefore we really can't trace any of the effects of these skills because it only serves as interludes." (R15)*

*"...we can teach, but as interludes, not as giving one special topic for the students to learn. We can interlude in each topic of Life Skills."(R3)*

*"...if in the topic that the students are doing projects are for Life Skills, then we may be able to interlude from the aspects of workshop cleanliness, don't throw the material waste all over the place because it can be reused." (R13)*

*"We can foster these green skills in the topics of wood work, electricity, electric production or electric source, green skills can be fostered in all."(R7)*

### **Diversity of the students**

*"...not all the Life Skills subject students are brilliant.... it means there are students who are bright and have finished, and there are students who are not so bright and can't complete the task. So, it is hard to get all the same."(R1)*

*"...maybe from the aspect of students' attitude, they want to do it or not. That is what we have to train little by little. So..., the implementation for Life Skills is hard due to their low level of knowledge."(R9)*

*"...it is more suitable for front class students (high academic), not that I am saying that the behind class students (low academic) totally can't do it. But the front class students are able to see the usage if the things. 'Oh teacher, I want to use this, use that,' meaning they can see that the things can be used". (R4)*

*"...acceptance by the students differs based on whether they want to do it or they don't want to do it, a bit of problem there... the problem is, their sketch is different but the project is different." (R12)*

## **Research Question 2: What are the types of green skills that are appropriate to be applied in schools?**

Based on the research findings, the respondents teach certain aspects of green skills to the students such as reuse of materials and material management; and minimizing the use of electricity and water.

### **Reuse of materials and Material management**

*"...design, for example I say materials such as ice-cream stick, rather than throwing it away .... Try to collect and do a project, add value to it." (R15)*

*"... I just need to tell them that they are given the opportunity to develop anything based on the materials that are available around them such as extra pipes and reuse."(R3)*

*"... but now, I have started for Form 1 and Form 2, I have started to foster creativity, which means, the students can use their creativity, put it in their waste materials product, create statues using the waste materials."(R11)*

*"Focus on waste skill about waste materials, about design skill, like... measure accurately, maximize the usage of the wood so that it is not wasted."(R2)*

*"...we have done this in school, especially extra woods; we separate it, and reuse and make it into something else.... We tell the students that indirectly the green skills have been applied."(R14)*

*"... normally we apply the skill of reuse for students' projects; that is what we emphasize."(R3)*

### **Minimize the use of electricity and water**

*"If here, indirectly we often remind the students to off the fans and lights when leaving the class, air-conditioner can only be used after recess."(R10)*

*"...if here, we have air-conditioner, can be turned on after recess. Whatever not being used needs to be switched off....the students are reminded to save water, off the tap after usage." (R8)*

*"...we always foster that if we want to cut down on electric bill, off all the switches, if plugged-in any plugs make sure to unplug."(R8)*

## **6.0 DISCUSSION**

The research findings show that the teachers are of the opinion that green skills need to be fostered as early as possible while students are still in the lower stage of learning; this is in line with the findings of Brown (2013); Mohd Zuhair, 2015); Arasinah et al., (2016). When green skills are instilled during the early stages of education, students will be able to continuously apply these elements until they step into the working world (Coljin, 2014: Fien & Guevara, 2013: KPM, 2011, RMK-11). This finding agrees with those of Hayward (2012), Stuhmcke (2012) and Amarumi et al., (2016) which state that students in the primary schools can be taught to understand environmental related issues. This is due to the fact that they are the next generation of the environment and thus need to be exposed to skills related to environmental sustainability.

The respondents also opine that the teachers need to be competent in green skills in order to educate the students well. This finding is similar to those of McCoy et al., (2012); Kennedy and Chow (2013): teachers need to be skillful and confident in planning the teaching strategies to attract students in learning green skills. Research findings of Nagra and Kaur (2014); Arunkumar (2012) and Jahonga et al., (2015); Majumdar (2011); Nagra and Kaur (2014); Nagra (2010) indicate that the teaching force lacks expertise in green skills and need specific trainings. This is because the teachers lack awareness of the concept of environmental education; thus, it is hard for them to apply it in their teaching. These green skills have advantages because they can be an interlude in each topic of Life Skills or other subjects. This idea corresponds with the research findings of Hanifah et al., (2014), which state that Education for Sustainable Development (ESD) can be applied in TVET to produce professional workforce knowledgeable in sustainable green skills (Suhaimi et al., 2010; McCoy et al., 2012; Pavlova & Huang, 2013; Ramlee, 2015; Asnawi & Djatmiko, 2016). The findings of Jagannathan (2013); Razeman (2011); Strietska-Illina et al., (2011) have this to say: TVET as a whole must focus on these green skills in preparing a resilient community.

The teachers face problems in teaching students to apply these skills because of the diversity of the students. The acceptance of the students differs according to their individual ability. In one class, there are various types of students with different levels of understanding and acceptance of the knowledge. The teachers need to guide weaker students, so that they can complete the planned project within the given time period. This finding is similar to those of Saravanan et al., (2013) and Hanifah et al., (2014), who found that the lack of sustainable usage practice in students' daily lives leads to a low level of application. This research supports the findings of Kennedy and Chow (2013) who found that students' acceptance of green skills and the ability to acquire them depend on the students' potential, apart from the support given by the school itself. Thus, in the research of Sola (2014); Mukoni (2013); Meenakshi and Leela (2014); Ramlee, (2015), the findings suggest that TVET education plays a role in presenting green skills to students, teachers and the community.

Based on the research findings, the teachers have indirectly imparted to the students the knowledge of green skills through the Life Skills subject. Material management and waste material reuse are among the skills that are appropriate to be taught in schools because each individual needs to be wise in managing material wastes. These materials can be found in old projects or out-of-use products which can cut costs, as suggested by the Ministry of Education Malaysia (2015). Apart from that, the research findings are comparable to those of Pan et al., (2012); McDonough and Braungart (2013) which state that students can learn the design skill and apply it, so that they can design something innovative using used materials and add value to them. The utilization of used or waste materials not only economizes on new material usage, but the recycled products can be used in daily life; and with proper planning, the process can be commercialized. Therefore, the government encourages the society to practice green skills to protect the environment, as reported by the findings of Sabri and Yong (2006); Sola (2014) and Carbonel et al., (2015).

The teachers often train the students to minimize usage of electricity and water at the schools. Students are often instructed to switch off all the electrical appliances before leaving

the class and to turn off the taps to prevent water wastage; this finding is in line with those of Ifegbesan (2010) and Raudsepp (2001). However, the research findings differ from those of Stauer et al., (2013), which found that the teachers do not give enough emphasis to sustainability development although that topic is in the school curriculum. As suggested by Brown (2013) and Dalia (2009), the practice and development of green skills are needed for future green jobs in the industry, and they include energy saving, water system sustainability, green development, recycling and low-carbon skills. Thus, these skills need to be emphasized when training children in the schools or educating the public through the media. Today, virtually all occupations are associated with green skills or environmental sustainability, in one way or another.

## **6.0 CONCLUSION**

Premised on the findings of this study, the education and training institutions need to think of ways and methods so as to create awareness among the young generation regarding the importance of nurturing the environment for the benefit and wellbeing of everyone. It would be of great help for the teachers to be exposed to the real environmental situations so that they can bring changes to the attitudes and behaviors of the students. The teachers need to be trained in sustainability and environmental education, only then can they teach students skills, knowledge, values, attitudes and behaviors related to sustainability. Thus, the duties of the community would be to practice the effective implementation of green strategies in resolving environmental issues at the national level or maybe even globally. The schools' role does not end with providing students with skills trainings to achieve their career goals, but it contributes towards the sustainability of the environment in the finest way.

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