

INTEGRATING ELEMENT OF GREEN SKILLS IN THE 21st CENTURY LEARNING

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Abstract: The outline of introducing green skills for a sustainable development is contained in the document called Transformation of Technical Vocational Education and Training (TVET), which is part of the 11th Malaysia Plan. There is a need to incorporate green skills into TVET programs to achieve sustainable development in the country, and in turn stimulate inclusive economic growth. The Ministry of Education, Malaysia launched the initiatives of the 21st century education in 2015. The secondary school standard curriculum framework has integrated knowledge, skills and values, and explicitly included the 21st century skills in the lesson for students. This study aims to explore the elements of green skills that can be integrated into the curriculum of STEM subjects (science, technology, engineering and mathematics). Qualitative research design was used to collect data from individuals through interviews, and focus group discussions; the information was then triangulated with the findings of the analysis document. The purposive sampling technique was used to select respondents. The findings reveal that there are 10 elements of green skills that can be integrated into the learning of the 21st century skills: communication skills, intellectual skills, interpersonal skills, self-management skills, learning skills, career development skills, environmental awareness skills, green practices skills, STEM skills and entrepreneurship skills. There is a necessity to incorporate the elements of green skills into the school curriculum, which will add value to the overall education. The students produced will form a pool of skilled manpower; they can act as catalyst to propel the nation towards sustainable development.

Keywords: 21st Century Skills, Green Skills, Green Technology, Sustainability

Introduction

21st century learning skills are learning abilities required by students in the new millennium. 21st century skills can be applied to different abilities required in this age. 21st century skills include communication skills, which comprise reading, counting and writing, science and engineering skills, interpersonal and intrapersonal skills. In order to produce a generation who has 21st century skills, an instructor/teacher needs to ace different fields, stay up to date with the latest approaches and training methods, be knowledgeable in instructional method utilizing the most recent innovation and apply the qualities that promote formation of moral values and good character.

The statement "21st-century aptitudes" is generally used to refer to certain center abilities, for example, cooperation, computerized proficiency, basic considering, and critical thinking that entrust schools to help students succeed in today's world. (Rich, 2010). The Assessment and Teaching of 21st-century Skills consortium (AT21CS, 2012), places skills, learning, and states of mind into four classifications: methods for considering, methods for working, devices for working, and living in this world. Most focus on similar types of complex thinking and communication attainment and all of them are geared towards teaching and learning instead of rote skill. These abilities are also commonly referred to as higher-order thinking skills, deeper learning out-comes, complex thinking and communication skills (Larson and Miller, 2011).

Workforce and management training groups often call 21st century skills as "soft" or "interpersonal" skills. Meanwhile professional training course of study call them "applied" skills or "workforce" skills. Numerous adolescent advancement programs allude to them as "life and career" skills. Researcher regularly utilize the expression "non-cognitive" skills. "Technology literacy" is specified as 21st century sub-expertise. With several terminologies, they can be defined differently as well. To different instructive associations and organizations, it is, information-science skills, digital media smoothness, advanced computer and internet communications, and "technacy," a more current term used to portray a profound learning of mechanical frameworks as indicated by Silva, (2009).

Council of Australian Governments (COAG) expressed "Green Skills" as reference to one of the skills based on the preservation of sustainable development in terms of technical knowledge, values and attitudes needed in the workforce to develop and support the social, economic and environmental elements established in business, industry and society. Green skills can also be understood as the knowledge and skills needed to live and work in ways that are environmentally responsible, and to address the impact of climate change.

Green Skills in Education

Education requires students to be competitive in this millennium. 21st century skills can be associated with a variety of skills that are needed such as communication skills, (consist of reading, writing and problem solving), science and technology skills, and interpersonal and intrapersonal skills. For a country to develop a generation who has 21st century skills, in line with the basic concept of green technology, a student must master a variety of skills, including applying green skills to themselves to increase their quality and value added to compete in today's era of globalization.

The goal of the National Green Technology Policy in Malaysia is to provide direction and motivation to the people of Malaysia so they can continue to enjoy a good quality of life and a healthy environment. The commitment of the solid waste towards green growth will ensure that the environment and natural resources are well preserved and protected for future generations (Vona *et al.* 2015: Fien and Guevara, 2013: Mohd Khairul, 2006). The strategic plan of the first transformation of vocational education is to provide vocational education curriculum that can generate human capital for employability and prepare individuals who are willing to pursue higher education. Hence, the transformation of the education curriculum should be implemented (Pavlova and Huang, 2012).

The 11th Malaysian Plan in the fifth strategic plan recorded building the culture of green technology among students is a necessary beginning of each level through the development of more effective syllabus. Therefore, it is vital that green technologies and green skills are nurtured from an early stage in primary school education rather than waiting until secondary-level education. The objectives is that the value should be synonymous with the students. With this, when they move to higher levels of education they will be able to apply their skills in green technology to produce a product, they will also be able to carry out activities in accordance with their acquired skills and knowledge before taking into consideration the development of green growth (Coljin, 2014: Fien and Guevara, 2013).

Recognizing that fact, ACET 2015 had eight key items on their agenda, focused on strengthening the TVET as contained in the Declaration of Kuala Lumpur in preparation to meet the requirements of the job market and adapt to the challenge of the 21st century. The fourth item on the agenda it is to integrate green skills (greening skills) for sustainable development in TVET platform to achieve sustainable development, including poverty reduction and economic growth.

Therefore to ensure that this agenda is achieved, the country should implement standardized programs to systematically introduce elements of green skills in the curriculum at school level. At higher education level the TVET system should have a comprehensive institutional approach for training and learning and also look at increasing professional capacity of teachers and trainers.

Strengthening Education for a Successful Student

The education system in Malaysia has to be suitable for the 21st century in order to become an industrialized country. Therefore the education system must shift to emphasize on quality to enable Malaysia to achieve this vision. Teaching and learning activities at all levels of education need to be creative and innovative in terms of knowledge and skills.

Students need to be equipped with more knowledge and skills as only competent students who will eventually enter the workforce in the future can meet various challenges and know how to grab opportunities. The current world is characterized by rapid and uncertain changes with technological advancement, requiring the need to equip students with multi-tasking and skills that can make them a skilful workforce. This is important to ensure their skills are relevant to the current and future job market, thus making them more employable.

The development of the country depends much on its nation. There is a much need to equip its citizen with necessary qualities. Such an effort will help produce educated and matured people who are able to contribute to nation building and have the willingness to do more than what is expected of them. The country needs people who are capable of sustaining the country's development and ready to bring the nation to achieve greater heights.

Education in Malaysia

A typical student in Malaysia undergoes three formal levels of education process; primary, secondary, and higher education. Primary or elementary levels aim to provide students with foundation knowledge reading, writing and arithmetic skills. Secondary level is an extension of primary level. Logically, student at this level should be taught more than just a basic knowledge (Mariam, 2009). Students need to be taught various skills to make them competent. At this level, higher order thinking and analytical skills such as the ability to apply critical evaluation are the skills needed to be imparted to the students.

Green skills is a valuable element of in producing competent students (Arasinah *et al.* 2016). It refers to the skills required in the development of a green economy and also awareness of environmental issues (Arasinah *et al.* 2016). Green skills must be taught in schools to educate the younger generation on the importance of sustainability practices through education. Development of training curriculum in terms of teaching and learning in green skills are needed in TVET education. This can be seen through the Secondary School Standard Curriculum (SSSC) to produce students of the 21st century that emphasizes learning skills in which students experience in-depth understanding of the inquiry approach and problem-based learning approach based on Science, Technology, Engineering and Mathematics (STEM), to train them in problem solving and decisions making.

Research Methodology

Qualitative methods were used for this study in which respondents were interviewed in depth (in-depth interviews) with several experts. Focus group discussion method was also included for information gathering and answer the research questions. Semi-structured interview question were used for this research. The purpose of this in-depth interview is to get as much relevant information. Through this method, there was also real-life interaction with the people interviewed.

Four experts were interviewed and seven members of the focus group were selected from expert teachers for this study. The selection of respondents based on predetermined criteria. Interviews were conducted by using a recording device. The researcher also took note of the reaction of experts and discussion group members. The data obtained from the interviews were transcribed and then analyzed to identify themes. In addition to that, document analysis was also used as analytical documents, blueprints and reports related to the study.

Findings

The findings of in-depth interviews and focus group discussions also revealed that there are 10 elements that can be considered green skills in the integration of the 21st century skills, namely: (1) communication skills; (2) intellectual skills; (3) interpersonal skills; (4) self-management skills; (5) learning skills; (6) career development

skills; (7) environmental awareness skills; (8) green practices skills; (9) STEM skills; and (10) entrepreneurship skills. This is because the success of a student is measured during their working life. Although the success of the school achievement is different for every individual, it still measures some aspects of the same skills. The focus of teaching should not be focussed on academics alone but should emphasize a variety of skills including attitudes, personality and other values that ultimately contribute to the students' employability, and most importantly is the concern for the environment.

1. Communication Skills

Findings from interviews with experts and focus groups are unanimous concerning the fact that communication skills are very important for students to help them deal with the outside world after the end of school life. Communication is very important in ensuring that all information can be communicated properly. Every student should have the skills to form a good relationship with each other. This refers to the statement expressed by the respondents as follows:

Panel 1:

“Now we are heading towards the skills of the 21st century ... e.g. communication skills are important ... because I've been invited as a jury to evaluate the projects carried out by students ... in terms of the model is good ... but when asked related SOP is quite difficult for the student to explain”

The results of a survey conducted by psychologists and communication experts, showed that people who possess good communication skills are deemed favourable among employers (Abdullah and Ainon, 2003). Elements in communication skills include; (1) speaking skills; (2) listening skills; (3) assess skills; (4) writing skills; and (5) reading. Results showed that these elements of communication skills among students are crucial for their future career.

2. Intellectual Skills

As indicated by Cambridge University, intellectual skills refer to basic, logical, combining and critical thinking skills. Scholars incorporate the osmosis of new learning, the advancement of a basic examination of considered data, and the use of essential information in more extensive settings.

Panel 2:

“Students will demonstrate skill in the application of scientific proficiency and methods, including the collection, analysis, and interpretation of data, and communicating of the final results”

Group Discussion:

“The skills will develop our students in writing... reading, speaking, listening, interpretation and information literacy skills... which are vital for academician work”

In view of the other two points of view, the training needs some sense, which incorporates the information driven and expertise centered approach. Logical thought, as one of the key scholarly skills that are anticipated from students, has progressively turned into the concentration of contemporary researchers and educators (Ding *et al.* 2016). An extreme goal of instruction is to set up our future specialists with required information and abilities. This includes equipping students to become proficient in thinking so they can utilize logical reasoning to devise causal from observation. The students must have high-level thinking skills.

3. Interpersonal Skills

Interpersonal skills are becoming significant to students as they enable students to deal with any individual regardless of what type of character he or she is. Interpersonal skills incorporate responsiveness in correspondence, trustworthiness, accommodation, great way, regard, thoughtfulness and sympathy. Furthermore, interpersonal skills are centered around undivided attention, very much created composed and oral correspondence, understanding the perspectives and places of others in the gathering, enthusiastic development, and subjective adaptability. If a leader has well-developed interpersonal skills, he or she will be able to promote a healthy atmosphere of confidence and reliance in the workplace and build valuable relationships among team members. This also related to the statement of:

Panel 3:

“A decent feeling of overseeing one-self is the essential part of interpersonal intelligencewe additionally called it as soft skills”

Group Discussion:

“Skills that are particularly detectable to others and they are the competency of a person to translate and deal with his/her own emotions, activities, inspirations and that of others in the social settings”

Students need to know how to manage individuals in the gathering exchange. With regards to skills, they should know how to discuss appropriately with their gathering. In the event that the student has an issue with interpersonal skills, the goal of exchange will not meet the objective. Lopez and Marlow (2002) characterized interpersonal skills as an accomplishment that one needs to keep in mind the end goal to discuss viably with someone else or a gathering of individuals. An individual with estimable interpersonal skills is guaranteed to land a not too bad position and set up wonderful compatibility in the work environment with administrators and partners. Skills like confidence, cooperation, stretch administration, authority qualities, critical thinking, correspondence, steadiness, basic leadership, outrage administration and listening abilities are named as interpersonal skills (Vijayalakshmi, 2016).

4. Self-Management Skills

Self-management is a key ability that will help students all throughout their lifetime. It includes setting objectives and time management. Students need to create inspiration and fixation skills which will help them to be more confident. Effective self-management will help them to minimize stress and give them more chances to get involved in school activities. A key skills in self-management is self-direction. It alludes to people observing, controlling and coordinating parts of their learning for themselves.

Panel 2:

“Students need to have the ability to feel more productive in doing things regardless of the daily routine environment. They must have the skills that will help them communicate efficiently with peer.....”

Panel 4:

“Any employer is interested in hiring a productive person who has ability in self-management skills. It is highly important to develop these skills in every student as they are going to build their career soon after finishing tertiary education”

5. Learning Skills

Learning skills are not subject particular, they are non-specific skills. This is because different subjects require different methods of learning. For instance, numerical skill, in the vast majority, depends on visual/spatial deduction and the acknowledgment of example, meanwhile, dialect ability typically depends on etymological memory and the ability to rearrange sound-related refinements. These are all skill sets that can be taught and incorporated either inside related subjects or in a non-exclusive learning abilities preparing program.

Group Discussion:

“...an inside and out human quality, a joining of information, abilities, individual qualities and understanding utilized fittingly and viably....the process of learning incorporate subjective, metacognitive and affective skills...”

These skills can be taught to each student. Once any student has acquired the particular 'learning skills' they are expected to handle, comprehend, recall and apply the knowledge, skills and information given to them at school and their learning capacity makes strides. They then acquire confidence in their own particular capacities, their accomplishment in all school subjects improves, and they achieve better result in tests and exams, these outcomes clearly show increase in their knowledge.

ATC21S has characterized these abilities of a knowledge-based economy as those that advance joint effort with others and association through innovation and has placed 21st-century skills globally into four general classifications:

- Ways of thinking - creativity, critical thinking, problem-solving, decision-making and learning
- Ways of working - communication and collaboration
- Tools for working - information and communications technology (ICT) and information literacy
- Skills for living in the world - citizenship, life and career, and personal and social responsibility

6. Career Development Skills

The competences needed to advance in one's career change along with development are known as career development skills. The Self Career management process is consist of three steps, which the worker must be aware of; (1) which competences he needs, (2) how he can develop them and (3) who has to support him to do it (Guglielmi, 2015). It is very crucial for each student to know how to make their pitch to employers after completing their tertiary education.

7. Environmental Awareness Skills

Environment includes all living and non-living objects. Individuals live on the Earth and utilize the natural assets like air, land and water to meet their everyday needs. Advancement likewise implies addressing the necessities of the general population. In the event that we utilize any natural asset, for example, ground water past its point of confinement of substitution, we may lose it for eternity. Accordingly, there is a need to create "awareness" of environmental protection. While effort are being made at the national and global level to ensure our environment preserved, it is likewise the duty of each resident to utilize our ecological assets with care. One of the panel members' comments it is imperative to create the environmental awareness:

Panel 1:

“We utilize natural assets in our everyday life. These resources are renewable and non-renewable. We must be more careful in consuming non-renewable resource like coal and oil...”

... Natural resources of land, air and water must be used wisely as a trust to guarantee a solid domain for the present and who and future generations”

From this point of view, the mindfulness in securing nature is exceptionally critical. One prominently effective case was empowering the utilization of reusable mugs (rather than disposable mugs), the utilization of paper bag (rather than plastic bag), attempt to use recycled paper, limit the utilization of vitality or acquiring of green items. The recycling program has been conducted on numerous occasions to promote environmental education and awareness of environmentally friendly habit and values to the general public.

8. Green Practices Skills

The establishment of Green Practices Commission of University City in Missouri in 2008 is to support manageable practice and projects that enhance the wellbeing and personal satisfaction history of their group; restore and secure the common assets, and reinforce the economy. Green practices skills can prompt all the more environmentally friendly and ecologically responsible decision and lifestyles which can protect the environment.

Panel 4:

“Nowadays people bring the bag for shopping.....they don't use plastic bag cause they will be charged 20 cents for each plastic bags. The government also encourage people to buy electric product which less energy

Considering the right factors, and taking the right path for greening the environment everyone should have green practices skills. Gundogan, (2012) stress the importance of:

- assessing the life cycle of products and processes, including their afterlife period
- using renewable and readily available inputs throughout the life-cycle
- selecting all material and energy inputs and outputs to be as inherently non-hazardous as possible
- choosing materials, components, or process alternatives that have reduced environmental impacts
- designing for disassembly and recycling
- preventing waste

9. Stem Skills

The education in the United States needs a more extensive, more planned procedure for precollege training in science, technology, engineering, and mathematics (STEM). That system ought to incorporate all the STEM profession and address the requirement for more noteworthy assorted qualities in the STEM for a workforce with deep technical and personal skills, and for a STEM-literate citizen prepared to address the grand challenge of the 21st century (Rodger, 2010).

The European Commission, (2007) has set out eight key items for lifelong learning skills in terms of communication in the native language, communication in foreign languages, numerical competency and fundamental capabilities in science and innovation, advanced ability, figuring out how to learn, social and urban skills, feeling of activity and business and social mindfulness and expression). Different views from Binkley, Erstad, Herman, Raizen, Ripley, Miller and Rumble (2012) attempt to classify abilities by individual and moral angles (living in this world), working (dividing them in tools for working and ways of working) and thinking (ways of thinking).

Among the most essential skills for any student (managing STEM or not) is the logical or algorithmic considering, now also called computational thinking. This term rises decisively within the discussion on digital

literacy skills (Seoane-Pardo, 2016). Notwithstanding that it additionally relates to the announcement from the panel with respect to of STEM abilities:

Panel 2:

“Such skills for instance ICT skills could be instructed through any subjects, provided that it is made deliberately and with the satisfactory educational methodologies and student is aware of the importance of STEM subjects”

Although several policy and curriculum documents are now recognizing the important role of the respective disciplines in STEM integration, including engineering, little attention is given on connecting core content knowledge and processes across the disciplines (English, 2016). The coordination of science, technology, engineering and mathematics skills is viewed as critical for financial advancement. This is on account of STEM skills are esteemed by each area. This is critical as student with better mentalities towards maths and science have appeared to score better in these subjects (TIMSS, 2010). These understudies are likewise more prone to settle on STEM subject decisions and proceed into STEM career in the future.

10. Entrepreneurship Skill

Entrepreneurship Skills are connected to leadership, risk taking, development and change management and they relate to soft skills (Cimatti, 2016). The key qualities are characteristics, for example, creativity, the capacity to continue going despite hardship, and the social abilities expected to assemble awesome groups. For instance, if somebody needs to start a business, it is normal to consider the particular abilities that support these qualities. It is likewise vital to cultivate entrepreneurial skills in the event that he or she engages in work that would build up a business, or "take things forward" more generally.

Some experts think of entrepreneurs as individuals who will go out on a limb that other individuals will most certainly not. Others characterize them as individual who start and build successful businesses. Contemplating the first of these definition, enterprise does not really include starting your own particular business. Many individuals who don not work for themselves are perceived as business people inside their associations. This is reflected in one of the panel's comments as below:

Panel 3:

“...students need to have basic knowledge skills on entrepreneurship....because nowadays we are moving globally...not all student will being employed after finish their school...maybe they want to venture into business...this skills is very important to them....”

Many scholars and policy makers agree that entrepreneurship is highly relevant for the success of today's societies owing to its effects on economic and technological development and the creation of new jobs (Baumol, *et al.* 2007). Thus today, entrepreneurial thinking and acting is seen as a 21st century skill, one of the basic meta-capabilities that the young generation will need to develop to be successful in life. (Obschonka *et al.* 2016).

Conclusion

Environmental education and training for greening skills needs to be addressed at all levels of educations and it has plays an extremely significant part in promoting mindfulness towards sustainability. An integrated approach should takes into consideration how the range of abilities can be tended to at various levels of training education. This requires an effective green framework, policy and practices for creating a highly skilled and

creative workforce and talent pool that are critical to achieving sustainable inclusive economic development in the 21st century. In this global economic challenges, people should have the awareness of the importance of sustainability and the need for green skills. This is in line with technical and vocational education that is needed to produce high-skilled labour who know the importance of sustainable development. TVET sector needs to take advantage of opportunities and worker productivity in the economy as well as building competitiveness in facing the challenges of change and development. Due to that, there is a clear evidence to show that TVET has assumed a key role in upgrading green improvement (Ramlee, 2015).

Acknowledgements

The author gratefully acknowledges the Ministry of Higher Education of Malaysia for the funding of the project FRGS (Fundamental Research Grant Scheme), 2015-0166-107-02 (FRGS/1/2015 /SS109 /UPSI/03/13). The author also acknowledges the constructive comments received by the anonymous reviewers.

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