



Green ICT and Self-directed Users

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Abstract

The Green information and communication technology (ICT) is introduced to support the implementation of the green environment. Promoting green technology and green economy includes "green manufacturing hub", green infrastructure", low carbon emission, efficient use of resources and a healthy, well-educated populace. For this study, the independent variable is the self-directed learning readiness while the dependent variable is the level of awareness on Green ICT. Seventy-seven distance learners participate in the survey. Purposive sampling technique chosen for this study. Findings showed that the level of green awareness scored high.

Keywords: GreenICT; Self-directed; Facebook; technology.

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1.0 Introduction

Public awareness to sustain the safety of the environment is pertinent. Efforts to increase peoples' awareness of the concepts and policies of sustainable development, global warming and the 'green' concept are taken by the authority concerned. Sustainable development becomes a visionary development paradigm among governments, businesses and civil society in the sustainable process. However, the concept did not work well as the implementation become difficult as being reported in the Brundtland Report (United Nation Headquarters, 2012). This report had witnessed a drastic awareness across the world since decades ago. However, the citizen engagement in taking care of the environment is still a long way off. Malaysia is not far behind as The "Green" practices in Malaysia are rather 'snail' phase and intermittent. The country may have started some fifty years ago with the smoke-free environment through the "no smoking" and energy saving campaigns as well as recycling, land conservation and animal conservation but the unsustainable practices continue and sustainable development has not made real progress. Endless initiatives through campaigns to include promoting green technology and green economy which include "green manufacturing hub", green infrastructure", low carbon emission, efficient use of resources and a healthy, well-educated populace being conducted to increase the awareness of the citizen to take care the environment. With all the green buildings and green technology, it is important that the attitude and thinking of the public be also "green". Having "thinking green" can reduce the problem of pollution. Therefore, this paper the Green information and communication technology (ICT) is introduced as a method to support the implementation of the green environment and green technology. For this, a changed in the learning style is discussed. In the Green ICT technology environment, learners and instructors are encouraged to engage in the use of ICT in teaching and learning. One such effort is using the internet as the medium to get connected with each other. Besides, Green ICT can combat climate change as learning can make possible through the use of videos via internet connectivity. By doing this, can minimize the use of transport thus reduced the emission of carbon dioxide as one of the reasons for global warming. The purpose of this research is to examine the level of awareness on the concept of Green ICT among the Malaysian self-directed learners among Facebook users. The study is to highlight how self-directed program can put to a good used specifically in raising the awareness to address issues of ecological imbalance and global climate change that is affecting many parts of the world. Together to take actions to minimize the environmental impact that prevails.

2.0 Literature Review

Energy consumption is one of the urgent issues that need special attention for sustainable development. The world that we live should be "environmentally friendly" as to ensure a healthy environment to live comfortably to improve our quality of life. (Theivaa, 2010). Application of Green ICT can be the way towards energy conservation. Its application is crucial as ICT is greatly used by human in daily activities. "The Green ICT allows for users to identify energy saving opportunities and possibly adjust their behavior to conserve energy" as stated by Weiss and Guinard, (2010). Green ICT refers to a study and practice of using

computing resources in an efficient, effective and economic way (OECD, 2009). The term efficient is doing things in a right way while effective refers to doing the right things (Encyclopedia of Management, 2006). Some of the examples of Green ICT would be the energy saving, disposal of electronic waste, virtualization of server resources, regulatory compliance, telecommuting, end-user satisfaction and return on the investment on the product used (OECD, 2009). As the human population continues to grow which give influence to the environment such as air and water pollution has become a threat to the health of the human life (Nathan, 2010). Therefore, due to these pollutions, an effort to cope towards a healthy life is viable, and the ICT system can be included as an integral part of this effort. This claim is in line with Nathan, 2010 that a "modern information tools are well poised to help people around the world shift to more sustainable life-style". This study had given a focus to the self-directed learners from the distance learning program that use ICT devices as their mode of learning.

A self-directed learner refers to an adult learner attending a distance learning program as an off-campus program. According to Knowles (1984), adult learners are referred to an individual that able to manage and responsible for his or her life. The criteria set by Knowles (1984) is consistent with the self-directed learners' characteristics for working adults. The creation of this type of learning is popularized among the working individuals looking for opportunities either to enhance their skill and knowledge but also for career development such as job promotion. Place limitation offered at the university is also a contributing factor for the creation of the distance learning that proliferates the establishment of self-directed learning in Malaysia.

The distance learning program is conducted with the aid of the internet technology. Therefore, this study is the emphasis on energy saving focusing on the use of ICT among the self-directed learners. The study is to seek whether the learners' behavior do contribute to the sustainable energy conservation. The awareness level of the environment protection among the self-directed learners naturally, highlighting the behavior of sustainable energy conservation. It states that energy consumption through the use of electricity in Malaysia comprised 90% of the energy used (Zainordin, et.all, 2012). Since ICT heavily relies on the electricity, the Green ICT should be given consideration to reduce its consumption.

Research Question, Objectives and Hypotheses

The research questions are:

- What is the level of awareness of the Green ICT among Malaysian Learners?
- What is the level of self-directed learning ability among Malaysian Learners?
- What is the relationship between the level of awareness of the Green ICT and the level of self-directed learning among the Malaysian Learners?

The research objectives are:

- To determine the level of awareness of the Green ICT among Malaysian Learners.
- To determine the level of self-directed learning ability among Malaysian Learners.
- To determine the relationship between the level of awareness of the Green ICT and the level of self-directed learning among the Malaysian Learners

The hypotheses are as follows:

- The hypotheses null is H0 – There is no relationship between the level of awareness of the Green ICT and the level of self-directed learning among the Malaysian Learners
- The alternative hypotheses is Ha - There is a relationship between the level of awareness of the Green ICT and the level of self-directed learning among the Malaysian Learners.

3.0 Methodology

The methodology chosen for this study is a quantitative approach. Questionnaires are used as the survey instrument to collect data. The samples are chosen from the University of Technology MARA learners enrolled in the distance learning programs. Among samples selection criterions, is having an account with Facebook. A survey with 18 item questionnaire was designed to measure the level of awareness of the Green ICT Concept. The distribution of the questionnaire was self-administered to ensure a high return rate from the participants. For this study, the independent variable is the self-directed learning variable while the dependent variable is the level of awareness on the Green ICT. The sample size sets at 100 participants and 77 filled questionnaire returned. Purposive sampling technique adopted and they are chosen randomly to participate in the survey. Figure 1 depicts the research framework.

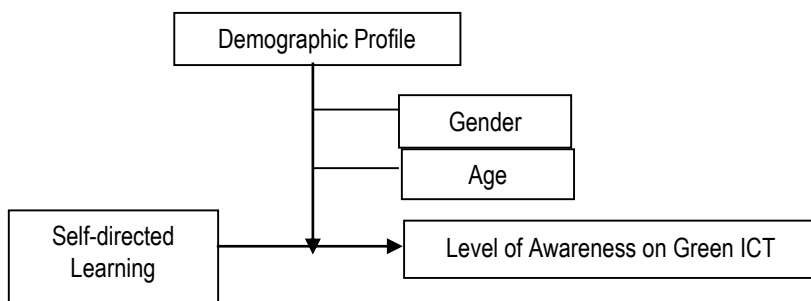


Figure 1: The Research Framework

4.0 Results and Discussion

Data is analyze using SPSS and the Alpha Cronbach for this survey instrument is at 0.75 which shows that this instrument is reliable. The scale to measure the level of awareness of Green ICT highlighted in Table 1.

Regarding the demographic characteristic of the samples, it was found that the mean age is 28 years old. Most of them have 8 years of working experience. The academic achievement is at 2.46.

Table 1: Demographic profile of the respondents

Variable	Mean Score
Age	28
Working Experience	8
Academic Achievement	2.46

Table 2: The Scale

Level of Awareness	The score
High level	67.5 - 90
Average	45 - 67.4
Poor	22.5 - 44.9
Below Average	0 - 22.5

The scale use to measure the level of awareness can be viewed in Table 2. The score of 67.5 – 90 represents a high level score, 45 – 67.4 represent the average score, while a poor score is from 22.5 – 44.9. A score of below 22 – 0 is considered as below average.

Table 3 : The Level of Awareness of the Green ICT Concept

Variables	N = 77
Level of Awareness	66
Minimum	46
Maximum	87
Standard of deviation	7.33

Table 3 shows the level of awareness on Green ICT concept among students surveyed. The level of awareness is 66 where the minimum level is 46 and the maximum level is 87. So, to conclusion it is suggested that the level of awareness among students on Green ICT is at the average level.

Table 4 : The Scale of SDLR

Level of SDLR	The score
High level	18.8-25.0
Average	12.5-18.7
Poor	6.25-12.4
Below Average	<6.24

The scale of Self-Directed Learning (SLDR) is shown in Table 4. The high level of awareness is represented a mean score of 18.8 – 25.0, average level 12.5 – 18.7 and a poor level from 6.25 – 12.4. A mean score of 6.24 and below is considered as below average.

Table 5: The Level of Self Directed Learning (SDLRS)

Variables	N = 77
Level of SDLR	17
Minimum	4
Maximum	25
Standard of deviation	3.4

The level of SLDR from the survey can be found in Table 5 above. From the table, it shows that the level of the SDLR of the students surveyed is at a mean score of 17. The mean score of 17 is in the average range level. Thus, it concludes that the self-directed learning ability of the students is also at the average level.

Table 6: Correlations between two variables

		Level of Awareness	Self -Directed Learning
Level of Awareness	Pearson Correlation	1	.797**
	Sig. (2-tailed)	.77	.77
	N		
Self Directed Learning	Pearson Correlation	.797**	1
	Sig. (2-tailed)	.77	.77
	N		

**Correlation is significant at the 0.01 level (2-tailed)

Table 6 shows that there is a high correlation between the two variables that is the level of awareness of the Green ICT concept and the variable of Self Directed Learning and the significance at the .000 level. Therefore, the hypotheses Ha - that there is a relationship between self-directed learning and the Level of Awareness on the Green ICT is accepted.

Table 7: The Level of Awareness against the mean score of items

Level of Awareness	The score
High level	3.34 – 5
Average	1.68 – 3.33
Poor	0-1.67

5.0 Conclusion

Awareness is an important tool to study the attitude and behavior of people. It is also an important tool for policy making and management. In this study the important findings include:

- the level of awareness on green ICT is average and the level of self-directed learning is average.

There is a relationship between the two main variables, Level of awareness on the Green ICT and the level of self- directed learning ability. The respondents are the working adults who have much working experience plus enrolling into the distance learning programs. Their

level of self-directed learning is average. These distance learning programs are implementing the "Green Concept" without much campaign on the issue. For example activities that relate to the Green Concept are:

- the usage of e books,
- the energy saving attitude where students only travel 5 times per semester to meet their instructors ,
- assignments that is posted in the emails to support the paperless concept.
- energy saving PCs are located in all labs and library of the University.
- Energy-Saving PCs located in all labs and library of the University.

In conclusion, any initiative, and programs from various parties be it organizations, NGO's as well as an individual and the public at large, focusing on the sustainable of ICT environment for future development seems to be very crucial to make the world we are living-in become a place for comfort and leisure. Therefore, the measurement findings of this study to highlight on how the application of ICT among the self-directed distance learners about their level of awareness on Green ICT will increase the understanding on energy conversation. Any effort towards awareness on promoting energy conversation will not be done on a short-term basis. Program on campaigns as well as doing research to solve the problem of pollutions as mentioned earlier in the paragraph should be increased. Promoting green technology through campaigns and events to increase the level of understanding on the danger of not taking care of the environment will only jeopardize the health. The consequences will lead to the lowering the quality of life for the people generally.

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