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Green IT Attitude and Behaviour in Higher Education Institution: A Gender Perspective

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Abstract: As a response to the growing concerns of the global warming and climate change, more and more organizations adopted environmental initiatives as part of their organizational ethos. Many Higher Education Institutions (HEIs), particularly, have implemented various on campus environmental initiatives through policy as well as teaching and learning activities. Despite the growing awareness of global environmental issues in education sector, little is known on how effective such initiatives in shaping the perception and behaviour of the students. Previous research also highlighted the differences on technology use and perspective between genders. Given the limited study in this domain, therefore, it is the aim of this study to evaluate the influence of gender on students' green attitudes and behaviour. The result of this study shows the needs to inculcate basic computer technical knowledge and skills so as to minimize the 'technical knowledge gap'. This is an imperative step to close, or at least to narrow, the gender discrepancy in regards to attitude and behaviour towards green IT initiatives.

Key words: Green IT, higher education institutions, gender, developing country

INTRODUCTION

There has been an increase of pressure upon education sector to take part in addressing the environmental issues (Shaheen *et al.*, 2002). Such pressures have not only come from government, but also from students, university administration and alumni. This is due to the central role of education sector in educating the current and future generation that literate and concerned with the environment and its associated problems. The education sector is also responsible to provide the knowledge, motivation, attitudes and skills for the students to work individually and collectively towards solving real life environmental problems (Dhawan and Joshi, 2011).

As a respond to these pressures, many Higher Education Institutions (HEIs) have adopted various on campus initiatives to address the environmental imperative in the way the campuses are operated. Among the common initiatives are the adoption of solar energy panel, recycling, environmental procurement program and campaign on energy conservation (Sharp, 2002). Despite various initiatives have been adopted in HEIs, little is known on how effective such initiatives in shaping the perception and behavior of the students, particularly from gender perspectives. Therefore, it is

the aim of this study to evaluate the influence of gender on students' green attitude and behavior.

GREEN IT INITIATIVES

"Going green" has become a popular slogan in recent years. Many organizations had declared their interest in taking responsibility to becoming greener by implementing varieties of initiatives. Some of these initiatives were manifested in the development of solar panel, rain water harvesting at office premises and so on (Goh *et al.*, 2010; Pant, 2011).

In education sector, the author noted an increasing number of implemented on campus green initiatives have been reported in both academic and trade literatures (Dhawan and Joshi, 2011; Pant, 2011). These initiatives were mainly aimed at minimizing the carbon footprints hence address the environmental issues. Among the many reported initiatives was energy conservation in using the IT devices (Pant, 2011). Interestingly, however, the lack of environmental issues awareness among students and staff in HEIs also has been persistently reported as well Dahle and Neumayer (2001). This highlight that further improvement is needed to incorporate environmental awareness into teaching and learning activities.

GENDER AND INFORMATION TECHNOLOGY USE

Many of the previous research in IT domain had identified the influence of gender on technology adoption and use. Among others is the research conducted by Morris *et al.* (2005) who found the differences in technology perceptions and use among male and female workers in USA. It was found that men are more influence with the instrumentality while women were more influence with the social and environmental factors. This finding was echoed by research conducted in developing countries, such as studies carried out by Moghaddam (2010) and Baker *et al.* (2007). These studies identified the disappearing of gender gap on the access to technology. They also found the notable difference on how the technology is being used by male and female in developing countries.

Despite the diminishing of gender gap in the access to ICT, these researches highlight the ‘technical knowledge gap’ between males and females. In the HEIs context, the gap in technical knowledge among female and male students was also highlighted by previous studies. The predominant reasons for such knowledge gap were due to teachers’ attitude (Herring and Marken, 2008), teaching style (Herring and Marken, 2008; Volman and Eck, 2001) and the perception that computer is a male domain (Huffman *et al.*, 2013).

MATERIALS AND METHODS

A survey was carried out in order to collect the data from students across eight different faculties in International Islamic University Malaysia (IIUM), Gombak campus. A total number of 268 responses were collected. Participation in this study was voluntary and no credit was given in exchange for participation. Students were assured that the survey is anonymous and individual responses could not be identified. It was also made clear to participants that the aggregates of their responses would be used for data analysis purposes only.

The instrument developed in this study was mainly adapted from the Goh *et al.* (2010). In addition, three items were added as suggested by respondents in the pilot study. These items are: (1) Disposing of IT waste in land field releases toxic waste, (2) I prefer to use inkjet printers instead of laser printers and (3) I prefer to use LCD monitor instead of CRT monitors.

To measure students’ green attitudes and behaviour, 5 (five) Likert-scale (1-always to 5-never) was adopted in this study (Vagias, 2006). Several statistical analysis techniques were carried out to examine the data collected through the survey. First, the descriptive analysis was

carried out to examine the response on students’ awareness of the on campus green initiatives. The impact of green IT initiatives on their understanding of the environmental issues was also examined. The Mann-Whitney Test was executed to measure the differences on male and female students’ green attitudes and behaviour.

RESULTS AND DISCUSSION

The aim of this study is to examine the gender differences on attitude and behaviour towards green IT. As discussed earlier in this study, IIUM has been adopted varieties green IT initiatives to address the environmental issues. Among others are the adoption of solar energy panel and campaign on energy conservation.

To measure students’ awareness and impact of the green IT initiatives, the students were asked whether they are familiar with the on campus green Initiatives. As can be seen in Table 1, the percentage of male students’ awareness is higher compared to that of female students, although the difference was not significant ($p>0.1$).

On the other hand, Table 2 shows the impact of green IT initiatives on students’ understanding of environmental related issues perceived by male and female students. Again, the difference was not significant ($p>0.1$). As can be seen on Table 2, in contrast to the findings on the awareness, the result shows that a higher percentage of female students agreed that the initiatives had helped to better understand the environmental impact of IT use. This finding is weak but consistent with the findings of earlier studies who found out that women were found to express greater concern for the environment than men (Mohai, 1992; Momsen, 2000; Xiao and McCright, 2012).

The result of the descriptive analysis also highlights another interesting finding. As can be seen in Table 2, the number of students who agreed that the green IT

Table 1: Awareness of on campus green IT initiatives

Are you familiar with the on campus green IT initiatives/strategy	Gender	
	Male	Female
Yes	58 50.877%	82 53.247%
No	56 49.123%	72 46.753%

Table 2: Impact of green IT initiatives on understanding of environmental issues

Do the on campus green IT initiatives make you more ware and understand the environment impact of IT use	Gender	
	Male	Female
Yes	32 28.07%	54 35.06%
No	82 71.93%	100 64.94%

Table 3: Students' perception and support of green initiatives

	Support all efforts that impact positively on the environment/gender									
	Strongly agree		Agree		Not sure		Disagree		Strongly disagree	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
I felt that many efforts to go green are largely lip service										
Strongly agree	7	11	1	4	1	2			1	
Agree	16	18	19	35	4	7	1	1		1
Not sure	5	10	22	28	12	8	2		7	
Disagree	6	8	5	4	5	6	2		1	
Strongly disagree	2		1	3	1		1			

Table 4: Means comparison on green attitudes and behaviour

Parameters	Male (N: 114)	Female (N: 154)	U
I prefer to use inkjet printers instead of laser printers	3.25	2.67	6260.5***
I prefer to use LCD monitor instead of CRT monitors	2.18	2.48	7292.5*
I always print on both sides of the paper whenever I am printing	2.99	2.56	6974.5**
I prefer to leave the computer in sleep mode when not in use to prevent damage	2.33	2.55	8057.0
I always prefer to save documents on disc rather than print on paper	2.27	2.09	7483.5
Purchase a new computer device whenever a new model is available	3.46	3.97	6633.5***
Purchase only energy efficient devices in the future	2.45	2.69	7483.5**
Purchase second hand devices for re-use if it suits my needs	2.86	3.29	6933.0**
Submit my computer peripherals for refurbishment or recycling	2.97	3.34	7162.0*

***p<0.001, **p<0.005, *p<0.05

initiatives have improved their understanding of environmental issues (32%) is still far below those who believe otherwise (68%). This probably due to the fact that most of the on campus green IT initiatives initiated by the university were mainly focusing on short-term project activities. Little effort has been done on embedding environmental sustainable development into the curriculum. As a result, students have little opportunities to understand the issues in detail which allow them to acquire the knowledge and identified skills and attitudes needed to be more environmentally responsible (Dhawan and Joshi, 2011; Sharp, 2002).

The result shown in Table 3 further emphasizes the need to provide a comprehensive understanding on the advantages of implementing the Green IT initiatives on campus. The result shows that many students perceived the 'Go Green' initiatives are mainly lip service or insincere. This shows the lack of understanding of the benefits and environmental impacts of these initiatives. Despite such perception, however, majority of the students still lend their support to all efforts that impact positively on environment.

A Mann-Whitney test was run to determine if there were differences in green attitudes and behaviour between male and female students. We obtained mixed results on gender differences in green attitudes and behaviour.

As can be seen in Table 4, the result shows that female students agreed more strongly that they "prefer to use inkjet printers instead of laser printers" (2.67 for females; 3.25 for men, p<0.000) and use both sides of the paper when printing (2.56 for females; 2.99 for men, p<0.005). Interestingly however, the result shows that

female students were more hesitate to purchase second hand devices for re-use, even if it suits their needs (3.29 for females; 2.86 for men, p<0.000).

In addition, as indicated in Table 4, the result shows that male students agreed more strongly than female students that they prefer to use LCD monitor instead of CRT monitors (2.48 for females; 2.18 for men, p<0.05). Significant gender differences was also identified on students support on computer refurbishment and recycle (p<0.01) and energy conservation (p<0.005) initiatives. It is found that male students were less hesitant to submit their computer peripherals for refurbishment or recycling (3.34 for females; 2.97 for men) and willing to only purchase energy efficient devices in the future (2.45 for females; 2.69 for men) compared to the female counterparts.

From the results above, it can be observed that female students were more inclined to support the green IT initiatives that are less technical. This echoes previous findings of Shashaani and Khalili (2001) who found that females felt more helpless around computers and stated that computers made them nervous and uncomfortable. They also found that many male students still largely perceive computer as a "male" field. As a result, male students often try to explore and experience with computers in order to equip themselves with more technical skills, despite their academic discipline (Broos, 2005). This finding highlights the needs to inculcate basic computer technical knowledge and skills despite their academic discipline. This approach will minimize the 'technical knowledge gap' and improve their understanding of environmental impact of IT use. The authors believe that such knowledge and skills will help

to close, or at least to narrow, the gender discrepancy in regards to attitude and behaviour towards green IT initiatives.

In addition, as reported in trade and academic literature, more and more governments are providing incentives for environmentally conscious businesses (Becker and Fuller, 2012; Nunes and Bennett, 2010; Schultz and Heitger, 2011). It is believed that such incentives should also be given to Higher Education Institutions (HEIs) to lead in providing the knowledge to enhance sustainability in society and by embedding sustainability in the curriculum. Such incentives can then be utilized by HEIs to encourage and stimulate faculty members, staff and students to actively involved in promoting green behaviour patterns and foster cultural change.

CONCLUSION

In this study, an assessment of gender influence on students' green attitude and behaviour has been presented. The study identified the difference on how female and male students perceived the on campus green IT initiatives. Female students were found to be more positive towards the non-technical initiatives, such as by printing on both sides of the page to reduce paper waste. Male students were found to be more inclined to support the initiatives which are more technical, such as submitting the computer devices for refurbishment. The findings also support previous research that highlights the 'technical knowledge gap' between male and female students, particularly those in non-technical disciplines. An improvement is needed in the HEIs curricula through inculcating basic computer technical knowledge and skills. It is believed that such improvement will enhanced the students understanding of environmental impact of IT use. In addition, the findings of this study further accentuate the importance of governments' incentives to assist HEIs in generating ideas that effectively promote green practices, behaviour and cultural change.

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