Green Computing: An Awareness Survey among University of Technology, Mauritius Students

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Agenda

• Green Computing
• Objectives of this paper
• Methodology
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• Conclusion
Green computing is the study and practice of using computing resources in an energy efficient and eco-friendly manner [5].

A broader definition is provided by Murugesan [6], who defined green computing as “the study and practice of designing, manufacturing, using and disposing of computers, servers, and associated subsystems, such as monitors, printers, storage devices, and networking and communication systems, efficiently and effectively with minimal or no impact on environment”. 
Green ICT or Computing refers to the efficient and effective use (minimum energy and resource consumption) AND disposal (dumping) of these resources with minimal impact on the environment.

- Production and use of ICT equipment are energy consumptive, and this accounts for 2% of total carbon emissions.
- Use and dumping of ICT devices will continue to rise, leading to irreversible damages to the environment.
Objectives

• This paper is an attempt to figure out the awareness of green computing among the students of University of Technology, Mauritius, more specifically the School of Innovative Technologies and Engineering. The main research focuses are on the following questions:
  – 1. The use of computer and technology by the students
  – 2. Green computing knowledge of the students
  – 3. Green computing practices by the students
  – 4. Attitude of the students towards green computing
Methodology(1)

• To seek answers to these questions, a 56 items questionnaire was prepared and distributed to students of the university. The survey consists of the following three sections:
  – (A) demographic questions
  – (B) a computer use section consisting of seven parts
  – (C) a green computing knowledge and practices section including questions about the information sources and channels used to gain ICT-related environmental knowledge.
Methodology (2)

• In the demographic section, questions regarding gender and level of study were presented to the students.

• Section B of the survey consisted of the following questions:
  – (i) How many years have you been using a computer?
  – (ii) How many hours per day do you usually use the computer?
  – (iii) How many hours per day are you normally connected to the internet?
  – (iv) How many years have you been using your current personal computer?
  – (v) How many computers have you owned in total?
  – (vi) What is the average number of pages printed per day?
Methodology(3)

• In section C questions were presented to observe “attitude of the students towards their responsibility for the environment”, “students’ knowledge about green computing and its advantages”, “students’ compatibility with green computing”, and “their intention to practice green computing”.

• The school consists of about 900 students and for our survey research, questionnaire was distributed among 5% of the student population [1]. The respondents study different ICT-related courses and the level of study of the participants ranged from year 1 to year 3.
Results(1)

Demographic Data

• According to the collected data, out of the 5% of students polled, the pair (female; male) was (45%; 55%).

• Analysis of the students’ year of study revealed that 36% of the students were in Year 1, 50% were in Year 2 and the remaining 14% were in Year 3.
Results(2)

Computer Use

• 71% of the students have been using computer for more than five years and 45% have owned two computers in total with a majority of them using their current personal computers more than five years.

• Most of them use a computer for around three to six hours per day and the same is true for the number of hours per day they are connected to the internet.

• 88% of the students print an average of one to five pages per day.
Results(3)

Green Computing Knowledge and Practices

• 80% of the students are aware that one definition of green computing may be the environmentally responsible use of computers and related resources.

• Sources: Universities/Colleges/Schools are the primary information sources followed by friends and family.
  – Only 5% of the students get ICT-related environmental knowledge from Government Agencies.
  – Social Networking Sites and Online Forums hold 60% of votes.
  – 12% recognize Radio as a channel.
Results(3)

Level of agreement concerning ‘responsibility for the environment’, ‘advantages of green computing’, ‘compatibility’ with respect to green computing, ‘attitude towards green computing’ and their ‘intention’ to practice green computing.

• More than 50% have positive thoughts towards environment and green computing.
• 44% feel that industries should take the lead in improving environmental issues.
• Around 40-50% remain neutral response to the statements corresponding to their compatibility with green computing.
• 30% think green computing fits with their everyday style of work.
Results(4)

• most of the students do not practice the low hanging activities that may reduce energy use and consequently the carbon footprint.
• Only 18% turn off their computers when away.
Discussion and Recommendations(1)

• The majority of the respondents are computer literate and use computer everyday. In addition, they utilize internet most of the time and this may be a major reason why Social Networking Sites and Online Forums are the primary information channels for gaining ICT-related environmental knowledge.
Discussion and Recommendations (2)

• From the descriptive statistics, we observe that the students do have some knowledge about green computing and their computer-related activities also adhered to their knowledge. Bearing in mind that they are university students, the result seems reasonable.

• However, some basic practice gaps were identified, particularly in the students’ practice of screen savers, monitor and system sleep, and switching off of the computer when away. It appears that the students are unaware of the fact that screen savers and sleep functions consume the same amount of energy as any running application.
Discussion and Recommendations (3)

• The survey further suggests that the students’ attitude are positive towards green computing. It is quite promising that the students intend to practice green computing even though we found that around 50% are neutral in response to the issue of compatibility with green computing.
Discussion and Recommendations (4)

• Green ICT policies implementation and managed by environmental advisory committees.

• Revision on a regular basis so as to build a strong foundation of green policies.

• The university should create a green ICT web-site to increase green awareness. The contents will be about green computing, some tips about how to save energy, the university green policies and any other information-related to green IT. Organization of workshops and competitions geared towards green computing and also sensitize the students about green computing during classes by use of green-related examples and questions.

• Lastly, since most of the students are neutral towards compatibility, the university must conduct more high level awareness programs which may lead to behavioral changes.
Conclusion

- This paper was motivated by the rising cost of energy through information technology and to quantify the awareness level of students with respect to green computing, in particular, green computing knowledge of the students and green IT practices by the students.
- Attitude of the students towards green computing was also focused on. A questionnaire was designed and distributed among the students of the School of Innovative Technologies and Engineering, University of Technology, Mauritius. The respondents were of both genders and the year of study ranged from year 1 to year 3. On whole, we observed that the students have moderate knowledge of green computing, but lack some low hanging practices.