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A COMPARATIVE STUDY ON GREEN COMPUTING AWARENESS AMONG ARTS AND ENGINEERING STUDENTS

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ABSTRACT :

     Green computing focus mainly on design, manufacture, use and disposal of computer and other related devices in an eco-friendly way. "Green Computing is defined as the study of designing, manufacturing, using and disposal of computer and associated sub products in a way to reduce their environmental impact." Improper usage of computers causes energy waste. The unwanted waste parts of computers are termed as e-waste. E-wastes contain toxic chemicals that pollute the soil and contaminate groundwater when dumped into landfills. Most motherboard components contain rare earth minerals and metals, including gold, silver and copper. Present generation students are using computers more than the previous generation people. This study discusses the green computing awareness between Engineering and Arts Students in Tirunelveli District. The study deals with the Engineering and Arts Students awareness on use and disposal of Computers. 50 samples were collected from Engineering and Arts Students. Percentage Analysis, Chi Square test and Weighted Average method tools were used to analyze the data with the help of Microsoft Excel and SPSS.

KEYWORDS : *Green computing, Green House Gases, Global warming, Energy.*

INTRODUCTION

     This study discusses the green computing awareness between Engineering and Arts Students in Tirunelveli District. "*Green Computing is defined as the study of designing, manufacturing, using and disposal of computer and associated sub products in a way to reduce their environmental impact.*" Improper usage of computers causes energy waste, which in turn increases the Green House gas generation. The Green house gases contribute to Global warming. "*The Goals of green computing was to reduce the use of hazardous materials, to maximize energy efficiently during the products lifetime and to promote the recyclability*"(Siddiqui, December-2013). It is the duty of every student to conserve energy and follow green computing concepts while using Computers. Present generation students are using computers more than the previous generation people. Hence a study to identify the mindset of current students on green computing becomes mandatory.

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COMPONENTS OF GREEN COMPUTING

Components of Green computing are Green use, Green disposal, Green design and Green manufacturing. (Murugesan, 10.1.2008). This particular study deals with the Green use and Green disposal behavior of Arts and Engineering Students.

Green Use

Green Use is the efficient use of Computer, which would help the environment to save energy and money.

Green Disposal:

Green disposal means recycling the unwanted Computing devices.

STATEMENT OF PROBLEM

Usage of Computer generates heat. The Heat results in carbon emission, which emits Green House gases. The Green House gases increases the atmospheric heat that results in global warming. Global warming melts the glaciers in Arctic and Antarctic region. Due to this the temperature changes occur all over the world. The rise or decline in temperature causes natural disasters such as droughts, floods etc. The unwanted waste parts of computers are termed as e-waste. E-wastes contains toxic chemicals that pollute the soil and contaminate

Fig.1 E-Wastes dumped into Landfill

groundwater when dumped into landfills. Most motherboard components contain rare earth minerals and metals, including gold, silver and copper. So the E-waste components are dipped into some solvents and acids to recover the rare metals from circuit boards, which releases harmful hazardous chemicals into the air. Thus the usage and disposal of computer harms the environment. Hence An awareness study becomes essential to know the students mindset towards the protection of environment.

REVIEW OF LITERATURE

(Bello, Ahmad, & Nordin, 2013) made a study to find the green computing knowledge among students and lecturers of Public University in Malaysia. The Study was done among 240 respondents (180 Students and 60 Lecturers) under purposive, random sampling. The study revealed that around half of the samples have no knowledge on Green Computing. The researcher suggested that Students and Lectures shall be given Conscious Training in energy efficient computing to improve their knowledge on Green Computing.

Suvaitharan and Rajalingam (2018) discussed the energy conservation Methods for Business by Green Computing. The manual works are replaced by Computers and electronic Devices in this digital era. Computers increase the Precision of work done and save time, but at the same time it has negative impact on the environment. Effective use of Computers without affecting the Environment was a part of Green Computing. Since fossil fuels are the major source of power generation in India, improper usage of computers causes energy wastage, which in turn increases the Green House gas generation. The research focused on energy conservation by means of Green Computing and discusses about the Energy Star logo, power management in computers, replace CRT monitors, printing tips and screen saver

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OBJECTIVES

This research is an attempt to figure out the following,
- To Compare the Green Computing Knowledge among Arts and Engineering students
- To Compare the Green computing practices followed by Arts and Engineering students

RESEARCH METHODOLOGY

The research is descriptive in nature. The researcher used primary data. The primary data was collected through questionnaire. Total of 50 samples were approached through non probability convenience sampling method. Data were collected by the researcher directly by meeting students. Percentage Analysis, chi square test, Weighted Average were used to analyze the data with the help of Microsoft Excel and SPSS.

Chart 1. Branch / Department of Students
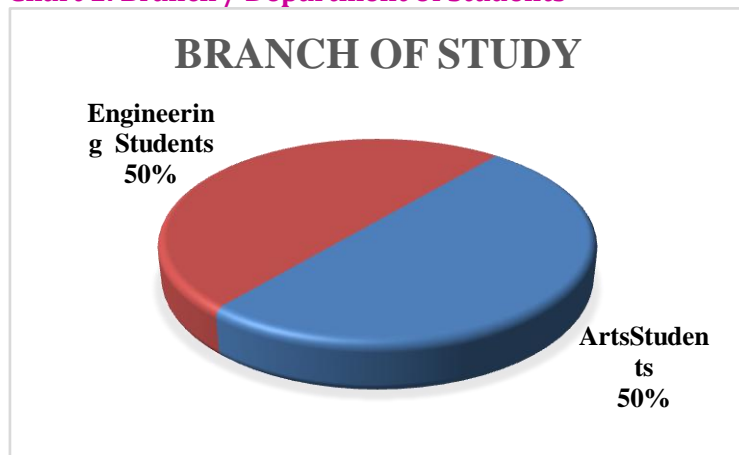
From the above chart it is interpreted that 50 percent of the respondents are Arts Students and another 50 percent of the respondents are Engineering Students.

Chart 2. Year of Study
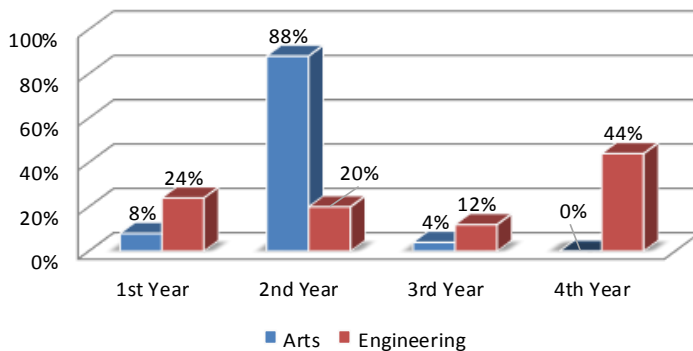
From the Chart 2. It is inferred that majority (88%) of the Arts students were 2nd year students. Majority (44%) of the Engineering Students were 4th Year Students.

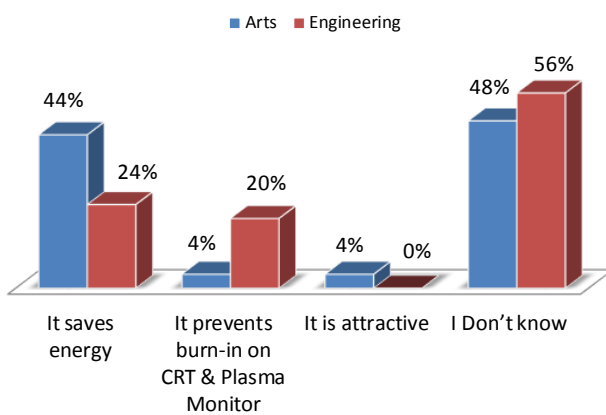## Chart3. Years of usage of Computers
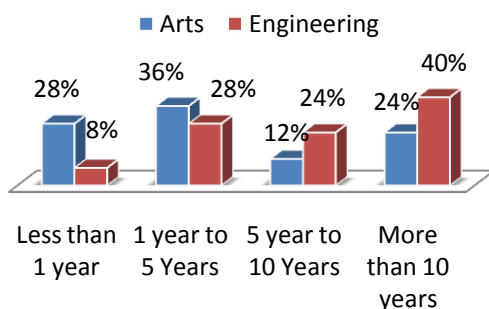
From the Chart 3. It is inferred that majority (40%) of the Engineering Students were using computers for more than 10 years. Majority (36%) of the Arts Students were using computers for 1 year to 5 years.

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Chart 4. Average laptop consumes less energy than a desktop PC

Arts ■ **Engineering** ■

	TRUE	FALSE	I am not aware of it
Arts	44%	28%	28%
Engineering	32%	8%	60%
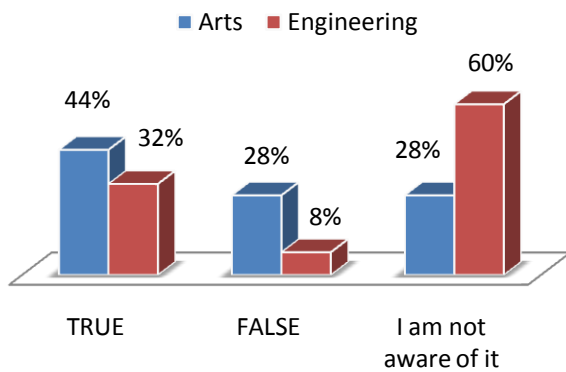
From the Chart 4. It is inferred that majority (60%) of the Engineering Students are not aware of the statement "Average laptop consumes less energy than a desktop PC". Majority (44%) of the Arts Students stated "Average laptop consumes less energy than a desktop PC" as true, Which is the correct option.
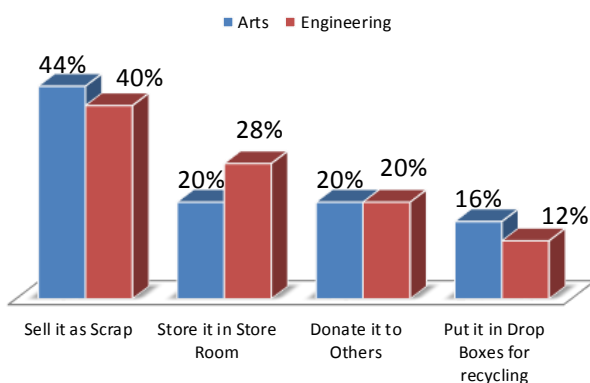
Chart 5. Reason for using Screen Saver

Arts ■ **Engineering** ■

	It saves energy	It prevents burn-in on CRT & Plasma Monitor	It is attractive	I Don't know
Arts	44%	4%	4%	48%
Engineering	24%	20%	0%	56%

From the Chart 5. It is inferred that both Engineering Students (56%) and Arts Students (48%) are not aware of the "Reason for using Screen Saver". 44% of Engineering Students and 24% of Arts Students stated that Screen Saver saves energy, which is wrong.

Less knowledge is very dangerous than no knowledge at all, So the students should be educated about Green Computing.

Chart 6. Method of Disposing the Computing devices

Arts ■ **Engineering** ■

	Sell it as Scrap	Store it in Store Room	Donate it to Others	Put it in Drop Boxes for recycling
Arts	44%	20%	20%	16%
Engineering	40%	28%	20%	12%

From the Chart 6. It is inferred that majority (44%) of the Arts Students sell the Old computing devices as Scrap. Majority (40%) of the Engineering students also sell their Old computing devices as Scrap. majority of Arts and Engineering students are not aware of the method of disposing their Old computing devices

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Chart 7. Eco-friendly action, when the Printer Cartridge/Toner is empty
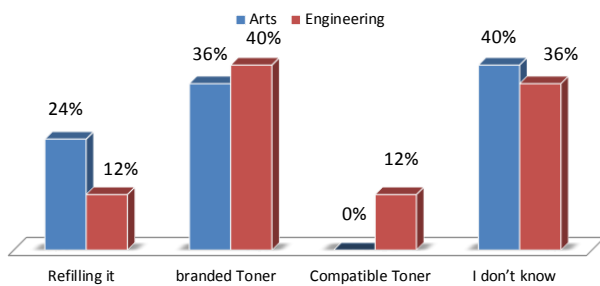
From the Chart 7. It is inferred that majority (40%) of the Arts respondents do not know the eco-friendly use of printer cartridge. Whereas majority (40%) of the Engineering Students stated that Replacing with the Braded Toner is the eco-friendly action, which is not the right option.

Table 1. Impact of Branch of study on the knowledge of Reason for using Screen saver

Chi Square Test	I Don't know	It is attractive	it prevents burn-in on CRT & Plasma Monitors	it saves energy	Total	
Arts	12	1	1	11	25	χ^2 =5.291 df = 3 p-value = 0.152
Engineering	14	0	5	6	25	
Total	26	1	6	17	50	

Since the p-value is Greater than our chosen significance level (α = 0.05), we accept the null hypothesis. Hence it is inferred that there is no significant association between Branch / Department of study and knowledge on Reason for using Screen saver

Table 2. Impact of Branch of study on eco friendly action on empty Printer Cartridge/Toner.

Chi Square Test	Refilling it	Replacing with branded Toner	Replacing with Compatible Toner	I don't know	Total	
Arts	6	9	0	10	25	χ^2 = 4.1053 df = 3 P-value = 0.25
Engineering	3	10	3	9	25	
Total	9	19	3	19	50	

Since the p-value is Greater than our chosen significance level (α = 0.05), we accept the null hypothesis. Hence it is inferred that there is no significant association between Branch / Department of study and awareness on Eco-friendly action, when the Printer Cartridge/Toner is empty.

Table 3. Green Computing Awareness

The students are asked to rate their level of Agreement on 10 Green Computing Variables in 5-point scale (Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree). The level of agreement of Arts and Engineering students were analyzed using Weighted Average method and ranked as given below.

S.No	Particulars	Arts	Engg.
1	Most of the parts of Computers are not bio degradable	1	2
2	Minimise E-Waste	2	5
3	Informal Disposing is harmful to our Environment	3	9
4	Reduce carbon Foot Print	4	8
5	Formal Disposing is Costly but sustainable to our Environment	5	3
6	Minimise Energy and Resource Consumption	6	6

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S.No	Particulars	Arts	Engg.
7	Improper use of computer have an impact on the environment	7	10
8	Toxic Chemicals are used while Manufacturing Computers	8	1
9	Green Computing does not harm the Environment	9	7
10	Green Computing is Essential for further Generation	10	4

From the Table 3. It is inferred that Majority of the Arts students agree that "Most of the parts of Computers are not bio degradable", whereas majority of the engineering agree that "Toxic Chemicals are used while Manufacturing Computers". Both Arts and Engineering students agree equally that Green Computing "Minimise Energy and Resource Consumption".

CONCLUSION

The purpose of the research is to compare the awareness on green computing among students. It is found that Engineering Students are using computers for more years than Arts Students. Both Arts and Engineering students does not know that Average laptop consumes less energy than a desktop PC. Both Arts Students and Engineering Students are not aware of the "Reason for using Screen Saver". Both Arts Students and Engineering students are not aware of the method of disposing their Old computing devices. Both Arts Students and Engineering students are not aware of eco-friendly usage of Printer Cartridge/Toner. The study reveals that Both Arts and Engineering students are using computers without the knowledge on energy conservation.

SUGGESTION

1. Students shall understand the global environmental problem and self motivate themselves to involve in green activities.
2. The Educational Institutions may motivate the students about Green Computing and explain its advantages.

REFERENCE

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