

An Empirical Study of E-Waste and Recycling Knowledge as per Age and Sex

Dr. Vipin Agrahari

Vice Principal

Vindhya Institute of Management & Science,
Satna, India

E-ID: vipin12agrahari@gmail.com

Abstract— Electronic Waste is simply known as “e-waste”. Electronic waste is term used to describe old, end of life electronic appliances, such as- computer VCRs, DVD players, mobile phones, fax machines laptops, mp3 players etc. which have been disposed by their original users. E-waste contains hazardous constituent that may negatively impact the environment and affect human health if not properly managed. It has been observed that in most of the cases, electronic items are stored unattended because of lack of knowledge about their management. The main aim of this study was to assess knowledge of young adults towards e-waste. A total of 120 respondents (60 from semi urban) were selected from Satna city .The data were collected using a self made administered interview schedule along with knowledge scale. The data was coded, tabulated and analyzed to test the frequency, percentage, t-test, and anova and coefficient correlation by using SPSS (version 20). The findings of the study revealed that respondents of semi urban area were having more knowledge than respondents of urban area.

Index Terms— *E-Waste, Young adults, Recycling Knowledge, Electrical and Electronic Equipment (EEE).*

I. INTRODUCTION

Electrical and electronic waste, also known as electronic waste or waste electrical and electronic equipment (WEEE), or in short called as e-waste, is used to describe obsolete or end of life electronic appliances. There is no generally accepted definition of e-waste around the world. However, e-waste is often misunderstood as comprising only computers and related IT equipments, or worse still, mistaken as e-mail spam. It is universally understood as electronic waste disposed of by end users and includes a wide range of products, from devices to complex goods. Therefore, e-waste comprises both white goods such as refrigerator, washing machine and microwaves and brown goods which consist of TV, radios and computers that have reached their ends for their current holder.

E-waste mainly comes from several sources:

- Residue or leftover materials from electronic products manufacturing process.
- Leftover parts or materials or discarded electrical and electronic equipment generated from a repair shop.
- Obsolete electrical and electronic equipment coming from governments, companies and other facilities.
- Obsolete electrical and electronic products mainly from households.

“E-waste” is a one of the rapidly growing problem today in the world. Disposal of e-waste is an being global environmental and public health issue, as this waste has become the most rapidly growing segment of the normal municipal waste stream in the world. E-waste contains hazardous constituent that may negatively impact the environment and affect human health if not properly managed. Due to lack of adequate infrastructure to manage wastes safely, these wastes are buried, burnt in the open air or dumped into surface water bodies. E-waste poses the most direct health risks when it degrades and the internal chemicals are released to the environment. Electrical and Electronics Equipments are made of a multiple of components these toxic substances may have direct impact on human health and the environment if they are not handled properly. This hazard occurs due to the improper recycling and disposal processed used. Public awareness of the e-waste is problem is only a start, the public has to be willing to support the companies that help to properly dispose of the e-waste even if the cost of their products is slightly higher. Consumers hold the power but need to be educated with the facts. The facts are recycling starts with the individual, with a little effort and an internet connection the average individual could learn where to recycle their electronic products. It is livelihood for unorganized recyclers and due to lack of awareness; they are risking their health and the environment as well.

Recycling

Today the electronic waste recycling business is in all areas of the developed world a large and rapidly consolidating business. People tend to forget that properly disposing or reusing electronics can help prevent health problems, create jobs, and reduce greenhouse-gas emissions. Part of this evolution has involved greater diversion of electronic waste from energy-intensive down cycling processes (e.g., conventional recycling), where equipment is reverted to a raw material form. This recycling is done by sorting, dismantling, and recovery of valuable materials. This diversion is achieved through reuse and refurbishing. The environmental and social benefits of reuse include diminished demand for new products and virgin raw materials (with their own environmental issues); larger quantities of pure water and electricity for associated manufacturing; less packaging per unit; availability of technology to wider swaths of society due to greater affordability of products; and diminished use of landfills.

Audiovisual components, televisions, VCRs, stereo equipment, mobile phones, other handheld devices, and computer components contain valuable elements and substances suitable for reclamation, including lead, copper, and gold.

One of the major challenges is recycling the printed circuit boards from the electronic wastes. The circuit boards contain such precious metals as gold, silver, platinum, etc. and such base metals as copper, iron, aluminum, etc. One way e-waste is processed is by melting circuit boards, burning cable sheathing to recover copper wire and open-pit acid leaching for separating metals of value. Conventional method employed is mechanical shredding and separation but the recycling efficiency is low. Alternative methods such as cryogenic decomposition have been studied for printed circuit board recycling, and some other methods are still under investigation.

Benefits of recycling

Recycling raw materials from end-of-life electronics is the most effective solution to the growing e-waste problem. Most electronic devices contain a variety of materials, including metals that can be recovered for future uses. By dismantling and providing reuse possibilities, intact natural resources are conserved and air and water pollution caused by hazardous disposal is avoided. Additionally, recycling reduces the amount of greenhouse gas emissions caused by the manufacturing of new products.

Benefits of recycling are extended when responsible recycling methods are used. In the U.S., responsible recycling aims to minimize the dangers to human health and the environment that disposed and dismantled electronics

can create. Responsible recycling ensures best management practices of the electronics being recycled, worker health and safety, and consideration for the environment locally and abroad.

II. OBJECTIVES

- To assess knowledge of young adults towards e-waste.
- To study relationship between selected independent and dependent variables.

III. HYPOTHESIS

- There exist no difference between knowledge of respondents about e-waste and age of respondents.
- There exist no difference between knowledge of respondents about e-waste and sex of respondents.

IV. METHODOLOGY

The present study was conducted on 120 respondents of urban area and semi-urban area of Satna city. 60 respondents from urban area and 60 respondents from semi-urban were chosen as respondents of the study. The sample was selected by using purposive random sampling technique. The independent variables of the study were gender and age. The dependent variables of the study were knowledge of respondents regarding e-waste.

Research Tools Used

Self made interview schedule was used for data collection. In order to collect the data from respondents, the researcher has framed the questions and standardized it. This schedule measured respondents knowledge level related to e-waste. It includes 36 items in the schedule each item has 3 alternatives like correct, Partially Correct and Incorrect. Based on the scoring pattern, knowledge scale is divided into these categories that are low, medium, high knowledge of the respondents.

V. RESULTS AND DISCUSSION

Our research showed that none of the respondents of urban area and very few of the respondents (3 percent) of semi-urban area were having low knowledge about e-waste. On the whole 1 percent of the total respondents were having low knowledge about e-waste. More than half of the respondents i.e. 55 percent of urban area and 67 percent of semi-urban area were having medium knowledge about e-waste. Also 61 percent of the total respondents were having medium knowledge about e-waste. 45 percent respondents of urban area and 30 percent respondents of semi urban area were having high knowledge about e-waste. More respondents were having medium knowledge about e-waste in semi-urban area compares to urban area.

Table 1: Analysis of variance between age & knowledge of respondent about e-waste:-

Group	Age of Respondent (in yrs.)	Mean	Standard	f-value	Sig.
A	20-30	76.08	14.9	7.295	0.03
B	31-40	71.93	10.4		
C	41-50	63.85	12.2		

(p < 0.5, level of significant)

Group A has high mean 76.08 in between the age group & 20-30 yrs. of respondent while group C has low mean 63.85. So, f-test was found significant. It was fully observed that the knowledge about e-waste was influenced by age.

VI. CONCLUSION

The study findings revealed that the majority of respondents (61 percent) were having medium knowledge about e-waste whereas only 2 percent respondents were having low knowledge about e-waste. It was also found that respondents of semi-urban area were having more medium knowledge than respondents of urban area. There was significant difference between age of respondents and knowledge of respondents about e-waste which concludes that knowledge level may vary according to age. Also there was no significance difference between of sex of respondents and knowledge of respondents about e-waste which concludes that knowledge may not vary according to sex.

REFERENCES

[1] Gupta S., 2007, "E-Waste Management : Teaching How to Reduce, Reuse and Recycle for Sustainable Development, Need of Some Educational Strategies".

Table 2: Analysis of variance between sex & knowledge of respondent about e-waste:-

Group	Category (sex)	Mean	Standard	f-value	Sig.
A	Male	72.68	13.28	1.15	0.76
B	Female	69.92	13.67		

(p

< 0.01, level of significant)

Mean & Standard of male & female respondent are approximate same. So f-test was found not significant. It shows that knowledge about e-waste was not influenced by sex.

[2] Kalana A., 2010, "Electrical and Electronic Waste Management Practice by households in Shah Alam, Selongor, Malaysia". International Journal of Environmental Sciences; 1(2): 132-144.

[3] Kurian J., 2007, "Electronic Waste management in India-Issues and Strategies". Eleventh International Waste Management and Landfill Symposium;5(1):74-82.

[4] Mittal D., 2012, "E-Waste: A Hidden Threat to Global Environment and Health". VSRD International Journal of Science and Technology; 2(3): 271-275.

[5] Sinha D., et.al. 2005. "A comparison of electronic Waste recycling in Switzerland and in India". Environment Impact Assessment Review; 25(2): 492-504.

[6] Y.C. Jang and H. Yoon, 2006, "The Practice and Challenges of Electronic Waste Recycling in Korea with Emphasis on Extended Producer Responsibility (EPR)". JK Journal of Management & Technology; 1(1):11-24.