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E-Waste Management (Reduce, Reuse, Recycle): A Challenge of Pupils Healthy Life In India

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Abstract: - "E-waste" is a popular, informal name for electronic products nearing the end of their useful life. The present thematic study says, Electronic waste or E-waste is one of the rapidly growing problems of the world. To know about the danger and management of E-waste and to find out the awareness of pupils regarding E-waste management, because it is mainly affects the healthy life of pupil and people in India. Some research report mentioned above of the burden of E-waste in India. The effect of E-Waste constituents on health. E-waste management is a biggest challenge and when giving importance to E-waste management strategies then only one can save the pupils healthy life. The pupil as a strength of our developing country going to be developed country. So that, the pupils must have awareness of Green ICT, that is how to reduce, reuse and recycle the E-waste.

Keywords: E-waste, Awareness, Management Strategies, Green ICT, Reduce, Reuse, Recycle

INTRODUCTION

Electronic waste or e-waste is one of the rapidly growing problems of the world. Electronic waste, popularly known as 'E-waste' can be defined as electronic equipments and products connects with power plug, batteries which have become obsolete due to:

• Advancement in technology
• Changes in fashion, style and status
• Nearing the end of their useful life.

The old electronic appliances such as computers, laptops, TVs, DVD players, mobile phones and mp3 players etc., which have disposed by their original users come in the category of E-waste. The electronic goods are classified under three major heads:

• White goods: Household appliances
• Brown goods: TVs, camcorders, cameras
• Grey goods: Computers, printers, fax machines, scanners etc.

All above electronic appliances when become useless, come in the category of E-waste. Waste from the white and brown goods is less toxic as compared with grey goods. This new kind of waste is posing a serious challenge in disposal and recycling in both developed and developing countries. E-wastes are considered dangerous, as certain components of some electronic products contain materials that are hazardous, depending on their condition and density. The hazardous content of these materials pose a threat to pupils' health and environment. E-waste contains toxic substances like Lead, Mercury, Cadmium and Polycyclic Aromatic Hydrocarbons (PAH) that have an adverse impact on pupils' health and the environment if not handled properly. Discarded computers, televisions, VCRs, stereos, copiers, fax machines, electric lamps, cell phones, audio equipment and batteries if improperly disposed can leach lead and other substances into soil and groundwater. Often these hazards arise due to improper recycling and disposal process used. Many of these products can be reduced, reused, or recycled in an environmentally sound manner. So that they are less harmful to the ecosystem. Therefore it is biggest challenge of pupils' healthy life in India to aware of E-waste management.

Burden of E-Waste in India:

In India, solid waste management, with the emergence of e-waste, has become a complicated task. The total waste generated by obsolete or broken down electronic and electrical equipment was estimated to be 1,46,000 tonnes for the year 2005, which is expected to exceed 8,00,000 tonnes by 2012. However, according to the Greenpeace Report, in 2007, India generated 380,000 tonnes of e-waste. Only 3% of this made it to the authorized recyclers' facilities. One of the reasons for this is that the India has also become a dumping ground for many developed nations. The Basel Action Network (BAN) stated in a report that 50-80% of e-waste collected by the USA is exported

to India, China, Pakistan, Taiwan, and a number of African countries. India is one of the fastest growing economies of the world and the domestic demand for consumer durables has been skyrocketing. From 1998 to 2002, there was a 53.1% increase in the sales of domestic household appliances, both large and small all over the world. Another report estimated that in India, business and individual households make approximately 1.38 million personal computers obsolete every year, accelerating the rate of e-waste generation, which is around 10%, annually. Another report, In the year of 2016, According to the Associated Chambers of Commerce and Industry of India (ASSOCHAM) in 2016 ranked India among one of the top five countries in e-waste generation, with an estimated 1.85 million tonnes generated annually. India accounts for roughly 4 per cent of e-waste generated annually. In globally, the United States ranked first in e-waste generation, generating 11.7 million tonnes of e-waste annually. China ranked second with 6.1 million tonnes of e-waste every year. India generated the e-waste is a 1.8 million tones generated annually it is going to affect environmental health indicators.

Effects of E-Waste Constituents on Health:

Effects of E-Waste Management in India		
Source of E-Waste	**Constituents**	**Health Effects**
Solder in printed circuit boards, glass panels and gaskets in computer monitors.	Lead(PB)	1. Damage to central and peripheral nervous systems, blood systems and kidney damage. 2. Affects brain development of children.
Chip resistors and semiconductors.	Cadmium(CD)	1. Toxic irreversible effects on human health. 2. Accumulates in kidney and liver. 3. Causes neural damage.
Relays and switches, printed circuit boards	Mercury(Hg)	1. Chronic damage to the brain. 2. Respiratory and skin disorders.
Plastic housing of electronic equipments and circuit boards.	Brominated flame retardents (BFR)	1. Disrupts endocrine system functions.
Motherboard	Beryllium (Be)	1.Carcinogenic (Lung cancer) 2. Inhalation of fumes and dust. 3. Skin diseases such as warts.

E-Waste Management Challenges in India:

India's methods of managing e-waste are different and more challenging than more developed countries. Due to the geographical and cultural diversities this makes e-waste management more difficult. These are a few reasons: High volumes of e-waste from both domestic and imported electronics. Inaccurate estimates of the amounts of e-waste created and recycled. Lack of knowledge from both manufacturers and consumers of hazards from improper e-waste disposal. Crude methods used in e-waste recycling such as acid leaching and open air burning creating environmental hazards. Workers unaware of toxins they are exposed to with e-waste and the potential health hazards. Poor quality recycling processes causing the loss of valuable material. Precious metals taken by recyclers or "cherry pickers" and disposing of the rest improperly.

Awareness of Pupils about Green ICT (E-Waste Management):

In the quest to improve the lives through technology one has to create electronic waste at an unprecedented rate. In

response, researchers have seen more attention focused on methods to reduce, reuse and recycle electronic waste.

i) Reduce

In the pursuit for faster computers, more features on smart phones and better picture quality, people are constantly replacing electronics with newer and better performing models. In improved performance, more features and better picture without increasing the amount of stuff purchased the movement afoot to reduce the amount of computer hardware that needs to be purchased in order to stay on top of the tech race. The term is "cloud computing" and although it may sound like a weather forecasting computer it is actually a concept of sharing resources such as computer memory, processing power, and software over a network. For example when one needs a fast computer to run software that one doesn't currently own and perhaps will only need for a set amount of time.

ii) Reuse

Recycle cans and bottles are easy in case of old computer that is far from high tech. The truth is that lots of people might want it including schools, low-income earners, and even those pesky computer geeks. While it may not suit the needs of anyone anymore there is such a wide spectrum of computer, uses out there with old clunker. People could use it to practice their typing or learn basic programming. The computer will extend its useful life before it meets a shredder in the next phase, which is recycling.

iii) Recycling

Recycling is the process where used materials are turned into new products (not necessarily the same original ones) so as to minimize environmental impacts such as underground leaching, emission of greenhouse gas through burning and to promote resource conservation. Recycling is a very natural way to reduce environmental pollution and as more people acknowledge the need to preserve the environment nowadays, the need to recycle becomes more of a good alternative. A number of interesting materials can be made from recycling whether it is done at home or elsewhere; for instance, used paper can be recycled to make gift wraps, cards, note books etc. which is very educational for young ones thus making them more environmental conscious.

E-Waste management Strategies in India:

The e-waste management strategies in India should address issues from production and trade to final disposal, including technology transfers for the recycling of electronic waste. This should include proper training, legislations and guidelines for all involved. Considering the severity of the problem, it is absolutely necessary that certain management options be adopted to handle the bulk e-wastes. Following are some of the management options suggested for the government, industries and the consumers to manage and handle e-waste effectively and in an environment friendly manner.

Conclusion:

The Thematic study concludes that the e-waste management (Reduce, Reuse, Recycle), is a challenge, and create an awareness of pupil healthy life management in India, It is still low and it is a biggest challenge. This gives an indication of the low level of awareness on e-waste at the municipal level as assumed each of these respondents represents a household within the municipality. There is also need for increasing awareness through teachings and seminars not only in the India but also at the municipal and local levels. The hazardous nature of e-waste is one of the rapidly growing environmental problems of the world. The ever-increasing amount of e-waste associated with the lack of awareness and appropriate skill is deepening the problem. A large number of workers are involved in crude dismantling of these electronic items for their livelihood and their health is at risk; therefore, there is an urgent need to plan a preventive strategy in relation to health hazards of e-waste handling among these workers in India. Required information should be provided to these workers regarding safe handling of e-waste and personal protection. For e-waste management many technical solutions are available, but to be adopted in the management system, prerequisite conditions such as legislation, collection system, logistics, and manpower should be prepared. This may require operational research and evaluation studies for a Green ICT and healthy Environment.

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