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# TECHNOLOGY AND SOCIETY

# Technology and Society

- **Technology** is the application of scientific knowledge to the making of tools to solve specific problems. Technological advances such as automobiles, airplanes, radio, television, cellular phones, computers, modems, and fax machines have brought major advances and changes to the world. Indeed, 20th century technology has completely—and irreversibly—changed the way people meet, interact, learn, work, play, travel, worship, and do business.
- **Social Change** : Alterations in the norms, cultural values, and behavioral patterns after some time

# Relationship between Technology and Social change

- Technological improvements increases information and knowledge
- Technological improvements leads to better technology
- Sociologists consider adaptation of societies to technological advancements

# Impact of cell phone on society

- ❑ Improved communication
- ❑ Improved access to information
- ❑ Increased convenience through research, banking and voice recording
- ❑ Message notifications interrupts people
- ❑ Additional phone features keeps people addicted in busy environment

# Impact of Computer in the society

- ❑ Increased interconnectivity
- ❑ Efficient information capabilities
- ❑ Computers perform complex mathematical problems in nanoseconds
- ❑ Numerous applications in driving and other manufacturing locations

# Impact of Internet on Society

- Increased access to information
- Ease of accessing knowledge
- **Online communication is helping to build social relationships around the World.**
- Internet added influence factors in social interactions such as trustworthiness, selfless guides, blogs and profile descriptions.
- Internet provided freedom of options to share feelings and thoughts within society. and this is the positive advantages of the internet in evolving new ways for social development

# Negative impact of technology on society

- Most people are addicted to Internet and its features, and they are losing the connection and bond of having a family, friends and relatives.
- Earlier we were wishing personally on special occasion, with Internet Best wishes, Happy birthday, Anniversary, etc. are now sent by using the Internet and this is nothing but artificial care.
- The Internet is also helping the politicians to infect society by dividing the unity of people by producing communalism and casteism material on the internet.
- Internet also host some material which are not suitable for children, teenagers. Many hacking information are available and children are interested in these things.

# Social Issues created by computer

1. Communication Breakdown
2. Defamation of Character
3. Identity Theft
4. Cyber Bullying
5. Gaming Addiction
6. Privacy
7. Health & Fitness
8. Education-Only copy paste
9. Terrorism & Crime
10. Sexuality



# E-waste management

- E-waste or electronic waste describes discarded electrical or electronic devices. Used electronics which are destined for refurbishment, reuse, resale, salvage recycling through material recovery or disposal are also called e-waste.
- E-waste is categorized by the Govt. of India under the broad class of hazardous waste. With in e-waste, there are several categories such as large and small household appliances. Electrical and electronic toys and sporting equipment, tools, computer and related equipment and so forth.
- Composition of e-waste: Electrical and electronic equipment contains metallic and non metallic elements, alloys and compounds such as Copper, Aluminum, Gold, Silver, Palladium, Platinum, Nickel, Tin, Lead, Iron., Sulphur, Phosphorous, Arsenic etc.

# E-waste management

- This process involves proper recycling and recovery of the disposed material. The recycle and recovery includes the following unit operations:
- **Dismantling** : Removal of parts containing dangerous substances(CFCs, switches, PCB); removal of easily accessible parts containing valuable substances(cable containing copper, steel, iron, precious metals containing parts)
- **Segregation of ferrous metal, non-ferrous metal and plastic**: This process is normally done in a shredder process.
- **Refurbishment and reuse** : Refurbishment and reuse of e-waste has potential for those used in electrical and electronic equipment which can be easily refurbished to put to its original use

# E-waste management

- **Recycling / Recovery of valuable materials** : Ferrous metals in electrical arc furnaces, non-ferrous metals in smelting plants, precious metals in separating works.
- **Treatment/disposal of dangerous materials and waste** : Chlorofluorocarbons(CFCs) are treated thermally, Printed Circuit Board(PCB) disposed of in underground storages, Mercury(Hg) is recycled or disposed off underground

# Benefits of E-waste management

- The e-waste disposal and proper recycling is very much necessary and important for the benefit of people, environment and nation. The key benefits are:
- Allow for recovery of valuable precious metals like copper, gold and zinc that should be recycled
- Protects public health and water quality: e-Waste contains a variety of toxic substances, which may include lead, mercury and cadmium, which should be disposed off systematically
- Recycling e-Waste domestically creates job for professional recyclers and refurbishers.
- Toxic Waste
- Saves landfill spaces: e-Waste is a growing waste stream Recycling these items will help conserve landfill space.

# Identity theft

- It occurs when someone uses another person's personal information such as name, Aadhar number, credit card number, or other identifying information to take on persons' identity in order to commit fraud or other crime
- Stealing an identity is, unfortunately, surprisingly easy to do and happens mostly to unsuspecting victims.
- Online identity theft is the theft of personal information in order to commit fraud.

# Identity theft

- Online identity theft is carried out through mix of actions such as:
  - ▣ Through phishing via your email account
  - ▣ Stealing your online purchase information where you give out sensitive information such as your credit card number or your Aadhaar details
- Various kinds of fraud can be committed by Identity theft :
  - ▣ Credit/Debit Card Fraud
  - ▣ Change your personal information
  - ▣ Bank / Financial fraud
  - ▣ Other fraud

# Identity theft - frauds

- ❑ **Credit / Debit Card fraud** : Thieves may obtain a new credit card getting block your original card.
- ❑ **Change your personal information** : Thieves may change your contact number for receiving OTP from SMS
- ❑ **Bank / Finance fraud** : Thieves may take loans from your account
- ❑ **Other fraud** : Thieves may use your Aadhaar number to get variety of utilities services or obtain a job in your name

# Protection against Identity theft

- You can protect yourself against identity theft by following the given steps:

**1. Protect Personal Information :** You should ensure that all your identification and financial documents are kept in a safe and private place. Before sharing your personal information make sure the safe use of it.

**2. Use Unique Ids to protect your devices and accounts :** To access your online accounts and digital devices, make sure to make them unique by following given steps :



# Protection against Identity theft

- ❑ Avoid names, address and DOB for login details
- ❑ Make password hard to guess.
- ❑ Use lower and uppercase letters both, number and special symbols.
- ❑ Do not use same password for multiple accounts.

## 3. Biometric Protection :

- ❑ Biometrics are any metrics related to human physical features such as voice, hands, fingerprints, earlobes, retina, iris, DNA etc.
- ❑ Modern age computing devices like smart phones provide biometric protection such as finger print login or face detection technology

# Protection against Identity theft

- ▣ But like other technologies, Biometric can also be misused. To avoid this you can make sure to:
  - Not to over use it
  - Use it only at places you are fully confident of and not at any unreliable place

# Gender Issue while teaching computer

- While teaching computers, there are many gender specific issues that must be addressed to enforce gender equality in computer science education.
- **GENDER ISSUE** : The trend that more boys opt for Computer Science than girls has been continuing for years now. So under representation of girls is one major issue. There are some other issues as well, lets discuss gender issue at school-level Computer Science education.

**1. Under representation** : A leading engineering institution of India has reported that there has been about 17% of girls represented in Computer Science engineering recent years. There are many factors as:

# Gender Issue while teaching computer

- **A. Preconceived Notion** : There are preconceived notions prevalent that subconsciously play a role. Notions like “**boys are better at technical things, girls are good at humanities, arts, etc. girls must take up career keeping in mind that they have to rise family. They must not take up high involvement careers and Teaching is the best option for girls as it gives you half day off and ample of holidays**” have their impact in decision making of girls while taking up subjects.

India parents also plays important role while option subjects, and parents directly or indirectly pushes girls based on preconceived notion to take subject other than computer science.

# Gender Issue while teaching computer

**B. Lack of Interest** : Most games available today are boys-centric that increases their interest in computers. Also at home boys get to play more on computers/smart phones and develop more interest in computers than girls

**C. Lack of Motivation** : Girls are pressurized to choose career option which will give them 'work life balance' in favour of family roles they have to play later on

**D. Lack of Role Models** : Girls these days see less of role models in the field of 'Computer Science' whom they can imitate. TV, movies, advertisement, every where it is portrayed that is technical fields like Computer Science are men's field. All these things influence girls sub psychologically and they infer that CS is for boys and do not take subject.

**E. Lack of encouragement in class** : As lesser number of girls in class, teacher choose boy for most work assignment. Because of lesser number of girls, lesser encouragement. Also some teachers pin point on their roles in society such 'girls will get married and may not take it up as career'. All this may play as Hindrance and girls do not develop as much interest as they can in 'Computer Science

# Gender Issue while teaching computer

**2. Not Girl Friendly Environment** : It has been observed that when, in schools, work-partners are chosen, boys prefer boys over girls. And even if a girl and a boy are made work-partners, boys prefer to work effectively and make girls silent observers. Boys are not comfortable in situations where they are not playing active roles.

Even if girls are given separate computers to work on, they are very shy of working actively. As per a study, the problems mentioned by girls in a computer room are like: 'insufficient access time', 'insufficient peripherals available' etc. contrary to problems mentioned by boys such as 'software not usable', 'limitation of software', 'poor quality of help' etc.

# Possible solution of Gender Issue

- There should be more initiative and programmes that encourage girls to take up Computer Science subject. Presently there are many initiative supported by government and run by many tech giants to encourage more girls to take up 'Computer Science' subject.
- The film and TV censor board should ensure fair representation of female role models in TV, cinema etc. so that more girls to take up 'Computer Science' subject
- In the practical room, girls should be encouraged more to work on their own and also to find solutions of their routine problems such as 'peripheral not available'. They should assertively speak to the lab attendant to get all the peripheral devices they want. They should be encouraged to celebrate small success in the lab (such as an error is removed from program) to big success

# Disability Issue while teaching using computer

- Increased focus on inclusive education and promoting access for students with disabilities and impairments, in the field of technology and computer science have made today's classroom really diverse and inclusive.
- In specially – abled students, there can be one or more disabilities:
  - ▣ Locomotors Disability: Polio, Leprosy, Cerebral palsy.
  - ▣ Hearing and speech disabilities : Hearing disability, speech aphasia
  - ▣ Cognitive impairment : Dyslexia, dyscalculia, Down's syndrome, etc.
  - ▣ Vision Impairment : Low vision, blindness



# Various Disability Issues

## □ Unavailability of Teaching Aid

- Students with different disabilities need different types of teaching aids/materials. For example visually challenged students would want that there are screen readers that could read the digital content to them
- Similarly, hearing impaired students would want more of visual input than oratory, rather oratory instructions should be available in sign language if possible.
- Students with locomotors disability can use virtual keyboards, joy sticks and programming editors that can support virtual keyboards
- For low vision students, Braille keyboards, braille monitors and braille Printer should be made available.

**Unavailability of such support programming aids are big issue**

# Various Disability Issues

## □ Lack of Special Needs Teachers

- For different types of special needs, if special needs teachers are available, disabled students get their needs addressed in right manner.
- There should be teacher who know what type of HW/SW TOOLS etc can be used for the differently able students as per their specific needs..
- There are many types of software features and voice assistant that visually impaired students can use are:
  - Microsoft Narrator, Cortana and Ubuntu Orca and Onboard voice assistant
  - Linux version Blinux for Blind
  - Accessibility features of Office software
  - Specialized editors for visually impaired students for typing programs.

# Various Disability Issues

## □ Lack of Supporting Curriculum

- Curriculum should be designed while keeping focus on inclusive education. There always should be possible alternatives keeping in mind special needs of the students.
- Software and programs should be so used so that the disabled students can easily work on that.
- Programming language that require manual coding such as Python, can also be used for teaching programming as long as specialized editors are available.
- The computer science contests and programming contests should be conducted so that all types of students can participate in them, inclusively.

# Possible solutions for Disability Issues

- ❑ School must work towards making available the required teaching aids/materials to fulfill special needs of students with disability.
- ❑ There should be proper budget allocated for buying the required material and equipment to promote inclusive education
- ❑ School must employ special needs teachers and should also train other teachers as well about how to interact with students with social needs so as to help them learn in a better inclusive way.
- ❑ School must support the inclusive curriculum and refrain from any other practice that directly or indirectly puts the disabled students at the disadvantaged side.