

Science in Everyday Life

- Role of Technology In Development
- Interrelation of Science and Technology
- Science v/s Technology
- Positive and Negative Impact of Technology

Technology

- Technology is a combination of technique, skills, processes, design, products, etc. which is dedicated to creating instruments or gadgets or to complete scientific investigation.
- It is a set of knowledge that has practical application in the creation, designing and utilization of products for industrial, commercial or everyday use.
- We are surrounded by things that are created with the help of certain technology, i.e. whether we work, communicate, travel, manufacture, secure data, business and almost everywhere.
- Most people use technology, to simplify their work and also to extend their abilities. It also ensures a solution to various scientific problems.

Role of technology

Technology has helped increasing productivity and efficiency in every field that it is employed. IT plays an important role in the economic and social development of the society .

Some of the areas in which technology is productively used are:-

Production: Technological change leads to improved production of goods and services. Production is made easier with the help of computers which handle much of the work, minimizing the efforts of laborers. Technology has reduced the cost of production and increased the efficiency in production on a large scale.

Computer aided manufacturing (CAM) – computers control the machinery. Reduced labor costs, accurate, faster and can work at anytime.

Computer integrated manufacturing(CIM) Computers control the whole production line

Ex- Car production

Computer aided design (CAD) Computers are used to help design products using computer generated models and 3D drawings. Helps reduce cost of building prototypes.

New production technology can increase the speed of production, improve the quality of the product and reduce costs per unit of production.

Agriculture:

Technology has helped to improve agricultural production all over the world with the use of tractors and other machines.

- It has improved productivity in low rainfall lands with new methods of irrigation.
- It has enhanced food quality with use of fertilizers, pesticides and also new seed qualities. This has led to increased productivity and production of agricultural crops.
- It is also responsible for better storage and distribution of agricultural products.

Ex- technology has enabled a longer shelf life of processed foods. Preservation of food products has brought more returns to the farmers and to the intermediaries.

Transport: Human's travel is not only increased in speed but also in safety owing to technological inventions in transport. Air travel is common today and also safe. Transportation technology has helped develop better trade too.



Communication:

- The internet has revolutionized communication among people.
- The intranet has helped make workplaces more efficient.
- The intranet is an internal system of computer communication

The internet is a **global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols like websites and emails.**

Ex- Easy communication between the suppliers and customers.

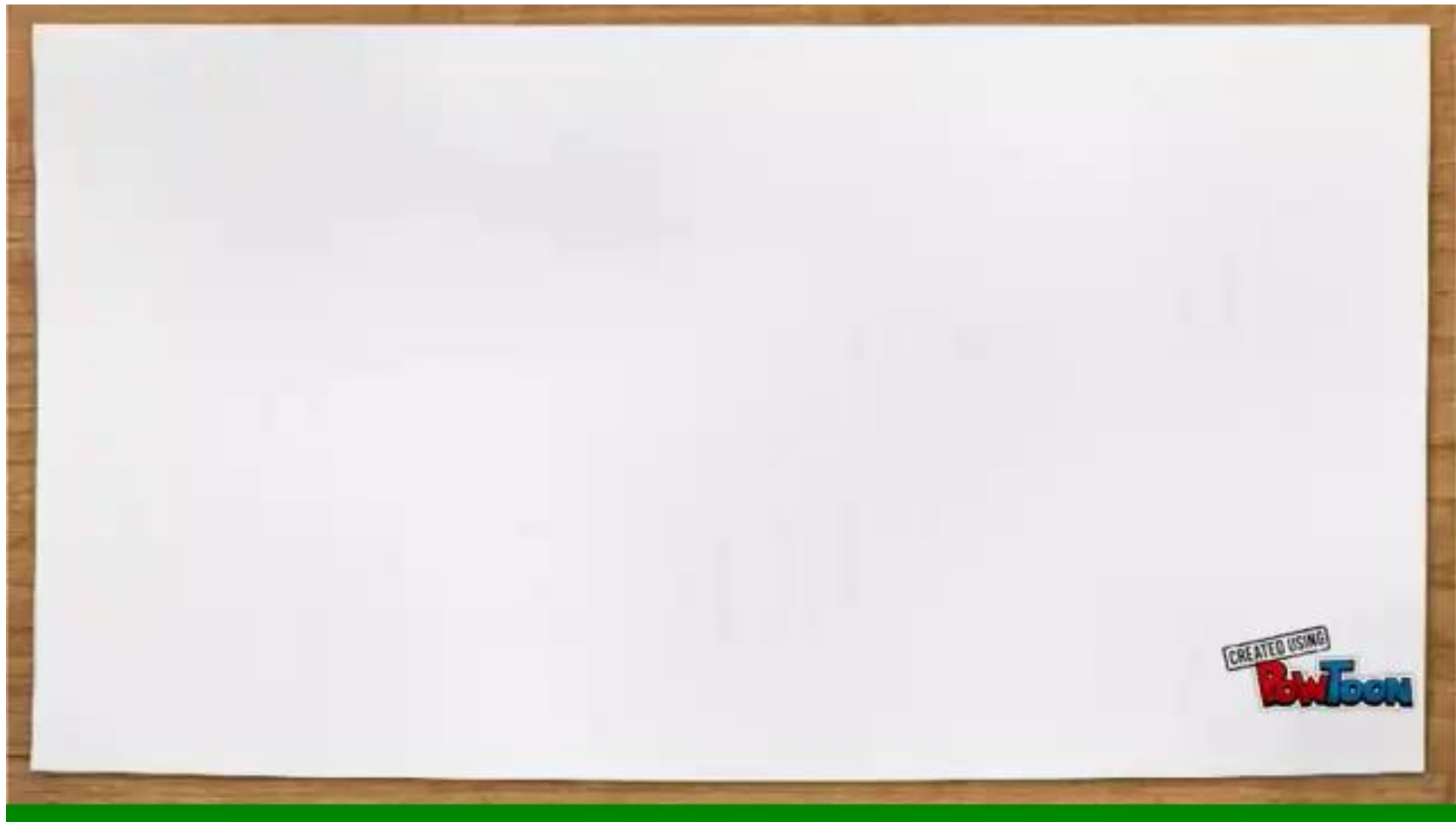
Since communication technology has become available at a low cost, it has connected people even from remotest areas.

E-commerce :

Ecommerce is the ability of businesses to trade with the world via websites.

With technology, larger markets and business is open 24 hours. This has allowed opportunities to business to trade throughout the world.

EX- Amazon as CD and Book Seller, Flipkart and other ecommerce websites.



CREATED USING
BwToon

Technology in Education:

Technology is use to make education more effective

Ex- the use of internet, PowerPoint presentations, overhead projections and other tools can make learning more effective.

The growing trend of virtual classroom is gaining popularity.

A virtual classroom refers to **instruction in a learning environment where teacher and student are separated by time or space, or both, and the teacher provides course content through course management applications(Google classroom), multimedia resources(videos), the internet , videoconferencing(Zoom) and so on.**



Technology in Services:

The service sector has also been improved with technology. Booking tickets, shopping, handling bank accounts and even setting up a business, such works are easily done with the help of computers and internet.

Ex- In Banking, the ATM facility provides 24x7 banking. Other examples of electronic Fund transfer System (EFTS), Real time Gross Settlement(RTGS), mobile banking has made banking simpler and quicker.

Ex- In Airlines, technology facilitates e-ticketing , screening of baggage, air traffic signals and so on.

Ex- In insurance sector, Collection of proposal forms, collection of premium, sanction of claims have become easier with the help of technology.

Technology in Medicine:

Advanced medical inventions have helped to cure many diseases.

Vaccinations, diagnosis and operation equipment's have increased the lives of people by detecting life threatening diseases at early stages and performing microscopic surgeries on highly risky organs like the heart and the brain.

With new advancements in surgeries, medicines and treatments has improved the life expectancy of humans.

The life expectancy of an average person has improved over the years.

Ex - In India, life expectancy in the year 1951 was 32 years . In the year 2012 it was 67 years.



Technology in Construction:

Software applications are available that support most aspects of construction projects. These include computer aided design (CAD) , computer aided cost estimation, planning and scheduling and site management. Large construction projects use prefabricated blocks that reduce the time of construction as well as the cost.

New tools in the field of construction aide the workers and help improve the efficiency.

Processing of data:

Computers can be used to process, analyze and store vast amounts of data to give business more quality information. This can help in the performance of the organization.

Technology has changed media and its forms. Man has reached space and is researching more about the universe with advancing space technology. Many other fields like construction, logistics, and commerce have also progressed with better technology.

Interrelation between science and technology

Scientific knowledge and methodologies provide a major source of input into the development of technological practices and their outcomes.

The very definition of technology explains it as an extension of science. The relationship between the both has several dimensions.

Following points explain the interrelation between science and technology:

Technological application:

New scientific knowledge leads to its application in a new field and for a new purpose.

For Example, the discovery of nano science has lead to advancement not only in computer technology but also in cosmetics and refrigerators.

Technology is the way by which scientific knowledge is combined with practical value and put to the benefit of humankind.

Both science and technology are based on experimentation and creation.

Exemplary relationship

Scientists explain natural phenomena on the basis of experiments. Many a times such experiments are done on instruments, tools and machines developed through earlier technologies. Such technological aids help in understanding and explaining scientific concepts better.

Ex- An orrery is a mechanical device that illustrates the relative positions and motions of the planets and moons in the Solar System in a heliocentric model.

These technological artefacts are useful in experience of learning and spreading scientific concepts, which are otherwise difficult and obscure.

In this case, the relationship between technological artefacts and scientific theories is exemplary.

Inspirational relationship

Science and technology take inspiration from one another for further development. Based on basic electrical sciences, engineers develop such machinery which is used in advanced electrical appliances. On the other hand, some technological devices provide science explanation of some unknown phenomena.

For Example, the invention of steam engine later gave basis for the creation of thermodynamics theory in physics. Thus the instrument gave foundation to research in science.



Instrumental relationship:

Technological artefacts are used by scientists to complete their work. These instruments are precise and are used for measurement, experimentation, and observation.

Technology is aimed to provide sciences with such devices that further increase scientific knowledge. Sometimes machinery produced for one purpose is used for another scientific experiment.

For Example, telescope invented by an optician in Europe, was later used and developed by Galileo for studying space. Skills and knowledge of the technologists can be thus used to advance science.

In the modern era, technological artefacts are built by technologists based on the specifications given by scientists. The function of the technological artefacts is integrated into the scientific activity.

In this case, the relationship between science and technology is instrumental

Scientific Discoveries:

New technological advances may lead to new scientific discoveries.

For Example, Developing DNA copying and sequencing technologies has led to important breakthroughs in major areas of biology, especially in the reconstruction of the evolutionary relationships among organisms.

Science v/s Technology

BASIS FOR COMPARISON	SCIENCE	TECHNOLOGY
Meaning	Science is a system of acquiring knowledge based on the scientific method , as well as the organized body of knowledge gained through research.	Technology refers to the tools, machinery, modifications, arrangements and procedures that help solve a problem , improve a preexisting solution to a problem, achieve a goal, or perform a specific function.
Purpose	The main purpose of science is to explain the natural world through intellectual and investigative practices that involve observations and experimentation.	The purpose of technology is to intervene in the world to produce something new. It achieves this through intellectual and design based practices that involve multiple sources of input (natural, conceptual, emotional, imagined, etc.)

BASIS FOR COMPARISON	SCIENCE	TECHNOLOGY
Goal	The goal of science is pursuit of knowledge and understanding for its own sake.	The goal of technology is the creation of artefacts and systems to meet people's need (new product)
Focus	Science focuses on understanding Natural phenomena	Technology focuses on understanding the man – made environment.
Most Observed Quality	In science the most observed quality is drawing correct conclusions based on good theories and accurate data.	In technology, the most observed quality is taking good decisions based on incomplete data and approximate models.

BASIS FOR COMPARISON	SCIENCE	TECHNOLOGY
Development models	Science involves discovery	Technology involves design, invention and production.
Skills to excel	In science, the skills required to excel include experimental and logical skills.	In technology, the skills required to excel include design, construction, testing, planning, decision making, interpersonal and communication skills.
Relevance of Result	Science involves making virtually value free statements	In technology, the activities are value- laden.

BASIS FOR COMPARISON	SCIENCE	TECHNOLOGY
Evaluation methods	In Science, Evaluation methods include analysis, generalization and creation of theories.	In technology, evaluation methods include analysis and synthesis of design
Mission	In Science, the mission relates to the search for and theorizing about the cause. (Gravity, Electromagnetism)	In technology, the mission relates to the search for and theorizing about new processes. (Control, Information)
Use	Science is used to make predictions	Technology is used to simplify the work and fulfill the needs of people.



WHAT IMPACT DOES
TECHNOLOGY HAVE ON
HUMANS???

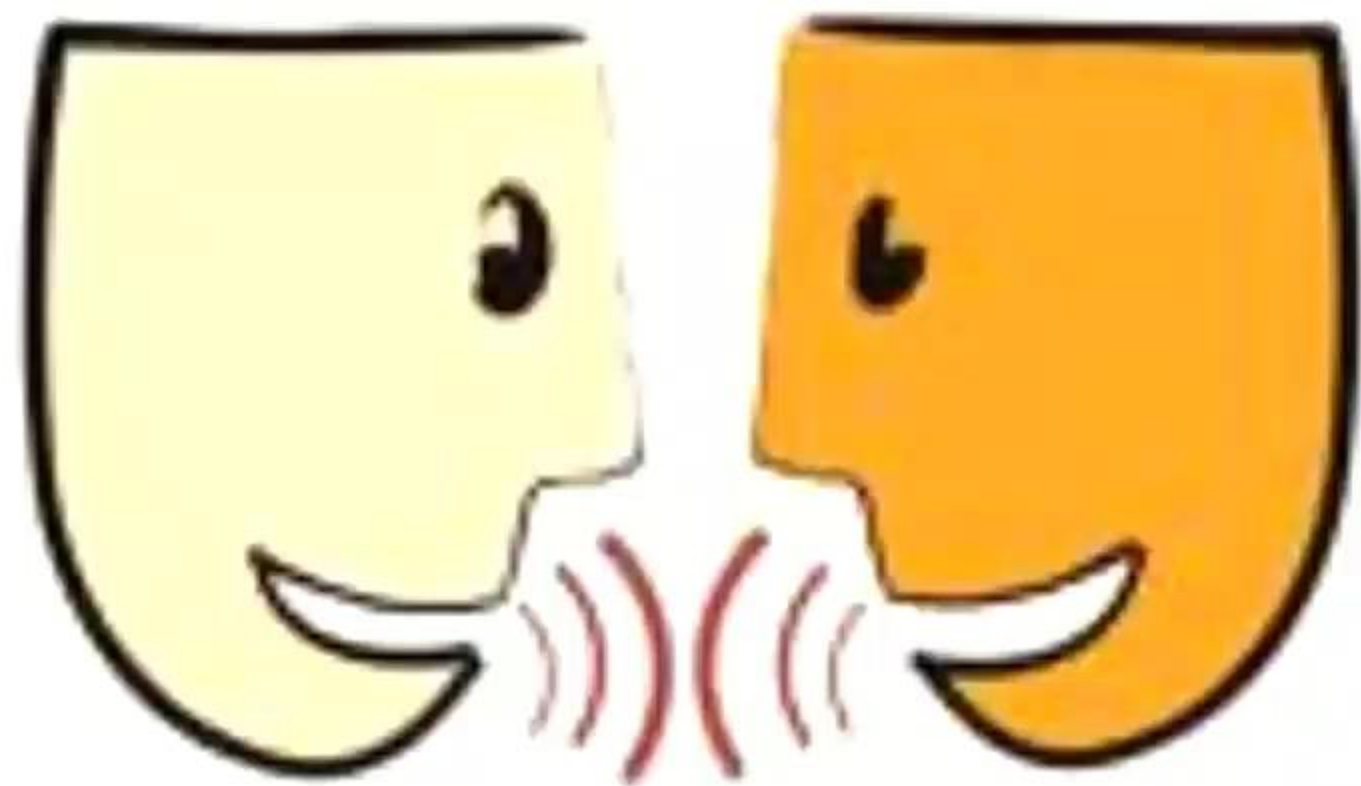
Positive effects of technology

Communication:

- Technology has been playing a vital role in the development of all kinds of communication.
- We use technological devices such as mobile phones, computers, laptops, etc.
- Today we can communicate all over the world - text messaging, audio calling, video calling are all parts of modern communication.

Trade and industry:

- Some of the actions of business that technology has boosted are accounting & information systems, management systems, point of sale systems, and other simpler or more complicated tools.
- Business communication is a lot easier today with the help of technology.



Health standards:

- Technology has made medical commodities a hundred steps ahead in development.
- It has also help improve health standards of the people.
- The invention of new machines, surgical instruments, medicines are the contributions of technology to the medical world

Research & Invention:

- Invention involves the discovery of new processes, ideas or tools.
- Technology is doing this successfully.

Flexible Working Hours:

- Technology has made life easier for people working in offices.
- One can do the work even from home with the use of internet and computers.



Technology and Household Work:

- Technology has reduced the amount of household work, especially of working people.
- For Example – Washing machines and other household gadgets help reduce work and save time.

Technology in Education:

- Several studies have shown that students who have better access to technology have a higher chance of learning and doing well at school.
- It cannot be denied that the internet is invaluable when it comes to research and supplemental studies for students of all levels

Changes in Lifestyles:

- Technology has improved lifestyles of humans
- Access to latest trends and fashion all over the globe provided by the internet and information provided by television via satellites.
- 24x7 online shopping from ecommerce websites without moving out of your house.
- Prices can be compared and shopping has wider options and the decision to buy can be easily made.
- Online reservations can be made for travel or stay purpose.
- Can call for food and other services at your doorstep.
- Can bank comfortably without any hassle of paperwork. i.e. 24x7 banking service, ATM, quick transfer of funds RTGS, NEFT.
- Use of modern APPS.



Negative effects of technology

The threat to human health:

- People are spending more time looking at their computer screens, playing games and talking to friends online, they are spending.
- Also, there is a huge possibility of a loss of eyesight and hearing, in people who spend too much time looking at computer and device screens and using headphones.
- Constantly looking at devices can also cause head and neck pain.

Lack of privacy:

- People share most of their personal information on the internet or other social media sites.
- It is estimated that the problem with a lack of privacy will only get worse with the further development of technology.
- If the users do not have enough sense of privacy, their personal information can be used against them.

Negative Effects Of Technology On Your Health



Poor sleep habits:

- Limitless using digital devices cause us being up late at night. This habit can cause a lot of health problems.
- Even people die of the diseases that are caused by limitless using digital devices.

Addiction:

- We are not only dependent on technology – we are addicted to it. Many studies have shown that when smartphones are taken away, people still heard or felt vibrations that weren't there.
- They become nervous and restless, which are some of the withdrawal symptoms you would expect from doing drugs.



Social skills:

- Extensive use of tech solutions is likely to result in poor social skills.
- When we replace real-life interaction with online communication, we lose the ability to read social cues like tone of voice, facial expression, body language, and direct wording.
- On top of it, violent games and videos kill empathy and bring destruction into individual's life.

Restricted imagination:

- When the children use much technology, they do not have enough time to use their imagination or to read and think deeply about the material.
- They find the information but they may not remember it, they might have difficulty to develop social skills and emotional reactions.
- There is a huge risk of cognitive impairment amongst users of too much technology.

POLLUTION



VideoScribe

Environment

- Overuse of technology can have adverse impact on the environment.
- Carbon emissions from household appliances, computer waste are factors responsible for environmental degradation.

Spread of Fake News

- Technology has led to the spreading of fake news.
- According to statistics, Fake news spreads 10 times faster than original news.
- Social messaging platforms and apps like WhatsApp and Facebook are the biggest source of spreading misinformation.
- Lack of awareness and inability to check the genuineness of the messages before forwarding or sharing them are probable factors.

Cyber Crimes

- Cybercrime is *defined as a crime where a computer is the object of the crime or is used as a tool to commit the offense.*
- These include :-
 - Phishing – using fake email messages to get personal information from internet users.
 - Identity theft – misusing personal information.
 - Hacking – shutting down or misusing websites or computer networks.
 - Spreading Hate and inciting terrorism,
 - Ransom – ware attack – cybercriminal injects a kind of malware(malicious software) in the device(computer network) to block access to data and then demands ransom to remove the malware.
 - Charity Fraud – cybercriminals extract donations from the people for charitable causes such as treatment of certain people especially children from life threatening diseases.