

HS 312 – Introduction to Science and Technology Studies

Lecture 2
Mahendra Shahare

Outline

- Why STS matters
- How science and technology are commonly characterised
- Why common picture of S&T is problematic

Course Logistics & Evaluation Policy

- Refer to the course note (Moodle)
- DX grade will be enforced. Bonus marks for above avg. attendance.
- Evaluation - Individual presentations (8 marks); group project presentation & report (12 marks); mid-semester examination (30 marks); end-semester examination (50 marks).
- The grading would be relative, subject to moderation. Below 40 is a clear fail (FR).
- Potential project topics – gender and ideology of merit, democracy and expertise, biotechnology and agriculture, big data and society, AI and society/democracy, medical genomics and ethics etc.

Course Logistics & Evaluation Policy

- Refer to the course note (Moodle)
- Students will be awarded up to 5 bonus marks over and above course total (100 marks) for above average attendance (5 marks for > 95%, 3marks for > 90%, 2 mark for >85%, 1 mark for >80%).
- Students with less than 80% attendance will not be permitted to write the end-semester exam and would be awarded DX grade. In exceptional case, at the instructor's discretion, you might be permitted to write the exam but with grade down penalty.
- If you find the evaluation policy as strict and unjust, please read an IITB Insight article here (<https://insightiitb.org/volume-10-3-whats-wrong-with-us/>) and drop down for a chat during my office hours.

STS

- Science and technology as **a way of thinking about the modern world**
- Interdisciplinary – Sociology, philosophy, history, anthropology
- Sites – laboratory, medicine, technology, environment, military, public policy (& politics)
- Case studies – empirical base
- **S&TS OR** science and technology studies – a project to understand S&T through social and material activities
- **STS OR** science, technology and society - a project to understand interlinkage of social issues and developments in S&T

What is science?

- Science and technology as **a way of thinking about the modern world**
- The products of S&T have huge effect on the way we live our lives and shape our environment
- Science enjoys unparalleled prestige in society
- There is an agreement on the need to fund modern science
- Science is viewed as an ultimate form of objective and rational inquiry
- The **problem of demarcation** – the problem of saying what beliefs are scientific and what are not (or pseudo-scientific) viz. Astrology, Creationism, Marxism

Common Picture of Science

- What is science ? What counts as scientific knowledge and how it is produced?
- Usually it is thought that science consists of a method or set of methods
- Often sciences are divided into two types – natural sciences (physics) and social sciences (economics)
- **Common picture** – science is a *formal* (rule based not ad-hoc or improper) activity that directly confronts the natural world for the creation and accumulation of knowledge
- **Systematic method** – various scientists perform an experiment using the similar setup -> scientists agree on questions and considerations -> different scientists assess the same evidence and decide on the same hypothesis -> as the end result scientists agree on *truths* about the natural world

Philosophy of Science

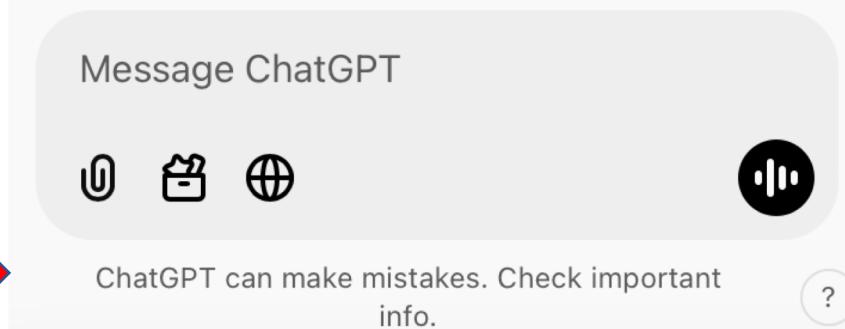
- Philosophical question – “How can we have knowledge as opposed to mere belief or opinion?”
- General answer is “follow the scientific method”
- **Epistemology** – what is knowledge as opposed to mere belief?; can we be sure that we may have any knowledge?; what things do we in fact know?



Source: <https://rarehistoricalphotos.com/>

Philosophy of Science – do electrons really exist?

- If I believe that the capital city of Australia is Sydney, which is false, then I cannot be said to know it
- Logically, a necessary condition for somebody to know some proposition is that the proposition is true
- Suppose that another necessary condition is that they believe that proposition
- Then knowledge is at least true belief



Philosophy of Science – do electrons really exist?

- I buy lottery ticket regularly and every week I believe that my numbers will come up. One week they do. Was it my knowledge though I had no adequate reason to believe?
- Knowledge can only be claimed when we have an adequate justification for our beliefs;
- Knowledge is *justified* true belief
- The Latin word Scientia (root of the word science) means knowledge
- What justification amounts to; specially when it is provided by following scientific methods for testing and arriving at our beliefs

Common Picture of Technology

- What we mean by technology ? How technologies are created/constructed?
- Common picture – **technology is application of science**
- Linear model of innovation – basic science -> applied science -> development and production
- **Technology as problem solving** – identify needs/problem/opportunity -> combine existing knowledge creatively to solve the problem -> as the end result technology becomes combination of scientific methods and human creativity



Source:

<https://www.youtube.com/watch?v=UwahG1s4dql>

Does STS Matter?

- So what do you think @ this ChatGPT+Canva experiment?

Artificial intelligence
(AI)

'Godfather of AI' shortens odds of the technology wiping out humanity over next 30 years

Geoffrey Hinton says there is 10% to 20% chance AI will lead to human extinction in three decades, as change moves fast

● 'We need dramatic changes': is societal collapse inevitable?



Dan Milmo Global technology editor

Fri 27 Dec 2024 15.50 GMT

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Source: <https://www.theguardian.com/>

The British-Canadian computer scientist often touted as a “godfather” of artificial intelligence has shortened the odds of AI wiping out humanity over the next three decades, warning the pace of change in the technology is “much faster” than expected.

Prof Geoffrey Hinton, who this year was awarded the Nobel prize in physics for his work in AI, said there was a “10% to 20%” chance that AI would lead to human extinction within the next three decades.

Previously Hinton had said there was a 10% chance of the technology triggering a catastrophic outcome for humanity.

Asked on BBC Radio 4’s Today programme if he had changed his analysis of a potential AI apocalypse and the one in 10 chance of it happening, he said: “Not really, 10% to 20.”

Hinton’s estimate prompted Today’s guest editor, the former chancellor Sajid Javid, to say “you’re going up”, to which Hinton replied: “If anything. You see, we’ve never had to deal with things more intelligent than ourselves before.”

Technology and its Effects

- Technology and its effects – whether social relations are determined by technology?
Is technology humanizing or dehumanizing? Do contemporary technologies serve broad public goals?
- These questions view technology as a finished product and generally **do not focus on** the creation of **particular technologies**
- If technology is applied science then it is **limited by the limits of scientific knowledge**

Thank you