The need for Critical Thinking

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Agenda

- Aim
- Critical Thinking
- Good and Bad Examples
- INCOSE's View
- What can we do?!
- A suggesstion for categorisation...!
- Final Thought

AIM

Take home message....

INTEGRITY, INTEGRITY,

INTEGRITY!

CRITICAL THINKING

"Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action."

Critical Thinking as Defined by the National Council for Excellence in Critical Thinking, 1987

Name the Critical Drinker?

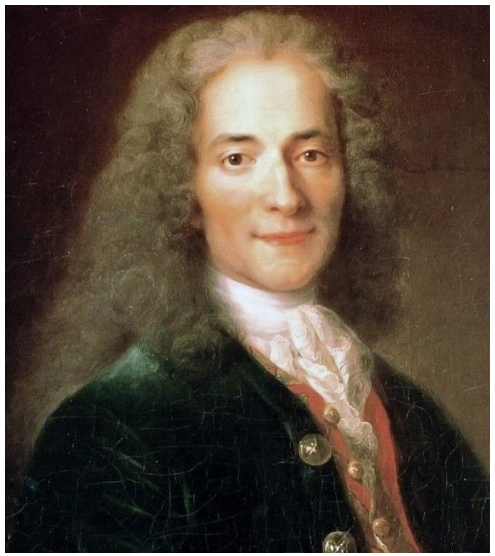
“Cousin” Boris

“I have been repeatedly assured since these allegations emerged that there was no party and that no COVID rules were broken.”

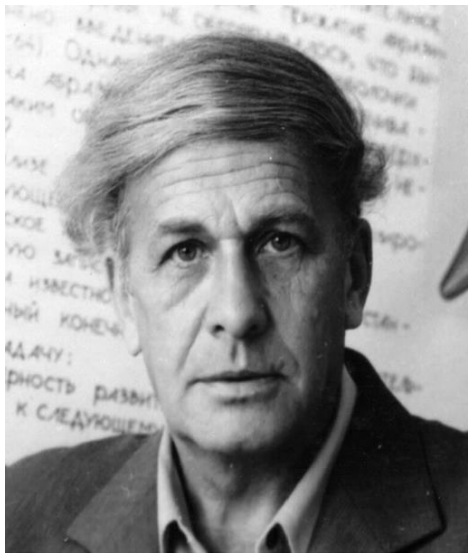
Well known Examples

Examples

Name the Critical Thinker?



Name the Critical Thinker?



Critical Thinking failures

What was missing? Critical Thinking, Integrity or both?

Prevalence rates for mental health outcomes among university students during France's COVID-19 lockdown:

- suicidal thoughts = 11.4%;
- severe distress = 22.4%;
- high level of perceived stress = 24.7%;
- severe depression = 16.1%; and
- high level of anxiety = 27.5%.

Healio

INCOSE's view

Code of Ethics: https://www.incose.org/about-incose/Leadership-Organization/code-of-ethics

Fundamental Principles

- Systems Engineers uphold and advance the integrity, honor and dignity of the engineering profession by: Being **honest** and **impartial**;
- Maintaining the highest levels of **integrity** and keeping abreast of the knowledge of their disciplines;
- Striving to increase the competence and prestige of the engineering profession; and
- Supporting the educational institutions, the professional societies and technical societies of their disciplines.

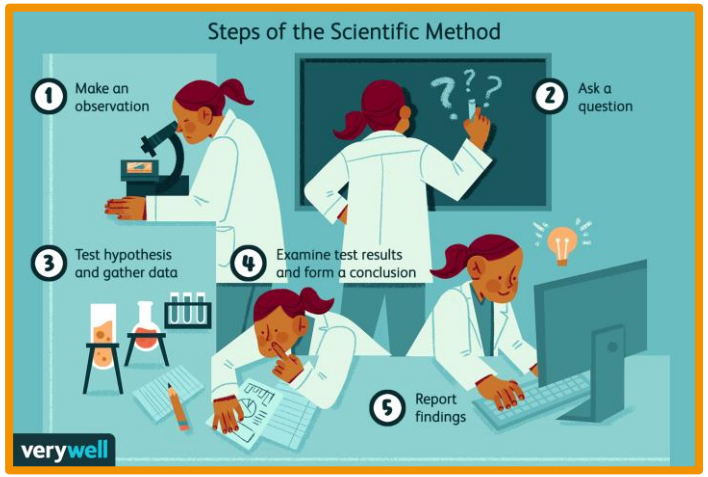
WHAT can we do about it?

How can we apply more critical thinking?

- Insist of counter-arguments before making decisions
- Take the devil's advocate role more often
- Propose Hypotheses, not conclusions!
- Challenge who is the technical accountable
- Examine cases where human fallibility was the root cause of tragic events, learn to identify these behaviours in others.
- Learn and apply the Falsification Principle, proposed by Karl Popper, as a means of demarcating science from non-science.

Categorising “sciences”

What’s the direction of travel?!

SCIENCE	SCIENTISM	SCIENTOLOGY
		
Motivation to find truth.	Motivation to make them believe you are telling the truth!	A cult

Final thought...

What happens if we fail to apply Critical Thinking?

Carl Sagan's last interview

Key points

- .. that science is **more than** a body of knowledge. It's a **way of thinking**.
- A way of **skeptically** interrogating the universe with a fine understanding of **human fallibility**.
- If we are not able to ask skeptical questions, to **interrogate** those who tell us that something is true, to be **skeptical of those in authority**, then we're up for grabs for the next charlatan, political or religious who comes ambling along.

AIM – Verification….

Take home message….

INTEGRITY, INTEGRITY, INTEGRITY!	
COURAGE	MOTIVATION