The Science and Scientist Bias

Giovanni Mazzitelli, Giornata Women in Science 2021, LNF-INFN
reference: https://arxiv.org/abs/1905.02936

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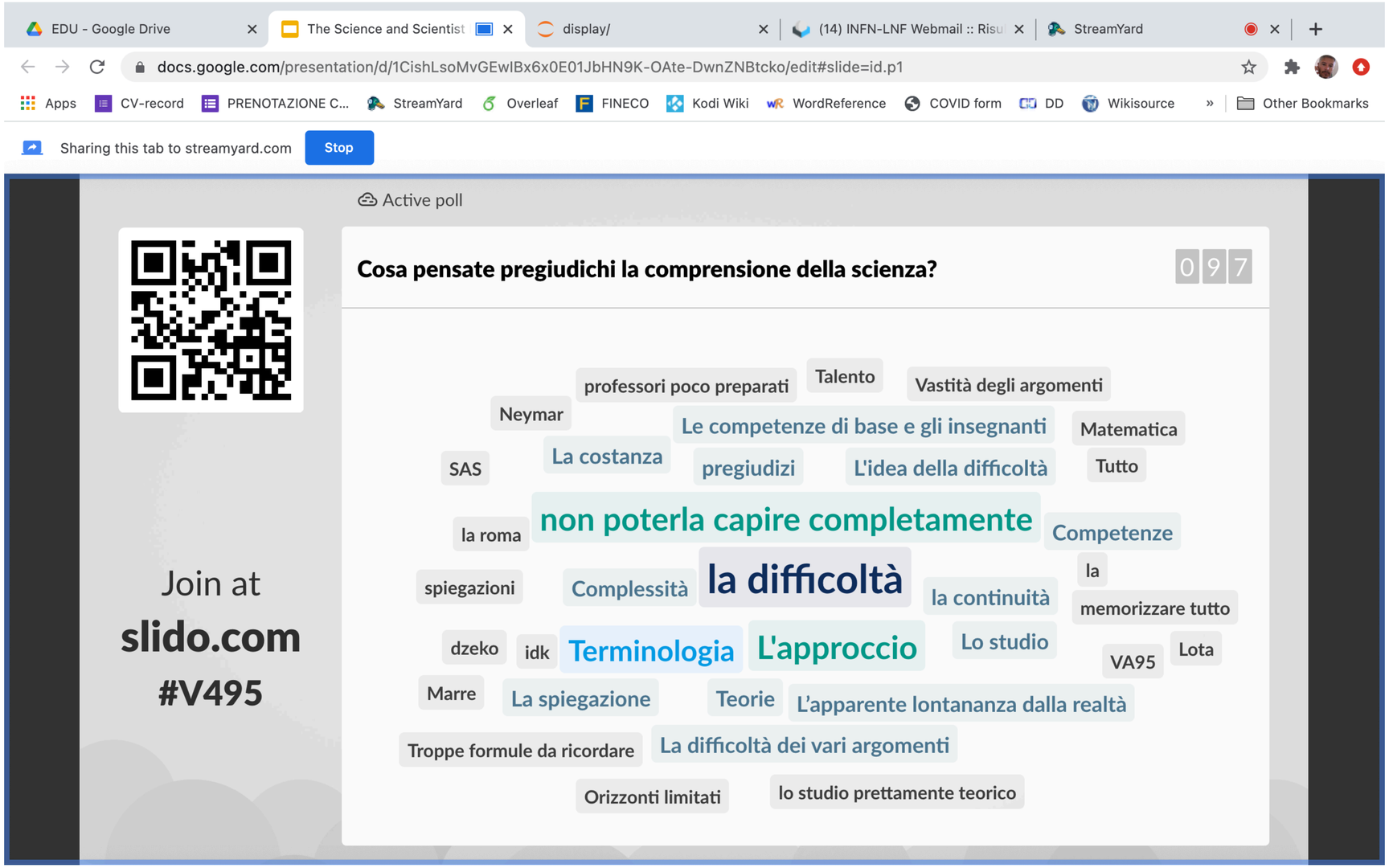
Quali pensate siano le difficoltà maggiori nel capire la scienza?

0 6 8

Trovare dei buoni libri e dei buoni professori che riescano ad appassionarti alla materia
la capacità di lavoro collettivo
Metodo di insegnamento
Le competenze
Poca cultura
i
Le formule complesse
Termini
L'impegno
I professori
mancsnza di cultura
Il linguaggio
Lo studio
disparità
Marreddu
terminologia
la terminologia
sium
Pregiudizi
la forza
Le definizioni
i campi
le competenze di base
La varietà degli argomenti
Molte cose astratte
Razionalità
Interesse
Stipendio nel mondo della ricerca
la stabilità di conoscenze che richiede
Lo sviluppare una visione olistica
Trovare professori che appassionino alla cosa
Mettere insieme tutto ciò che si sa in maniera opportuna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Cosa pensate pregiudichi la comprensione della scienza?
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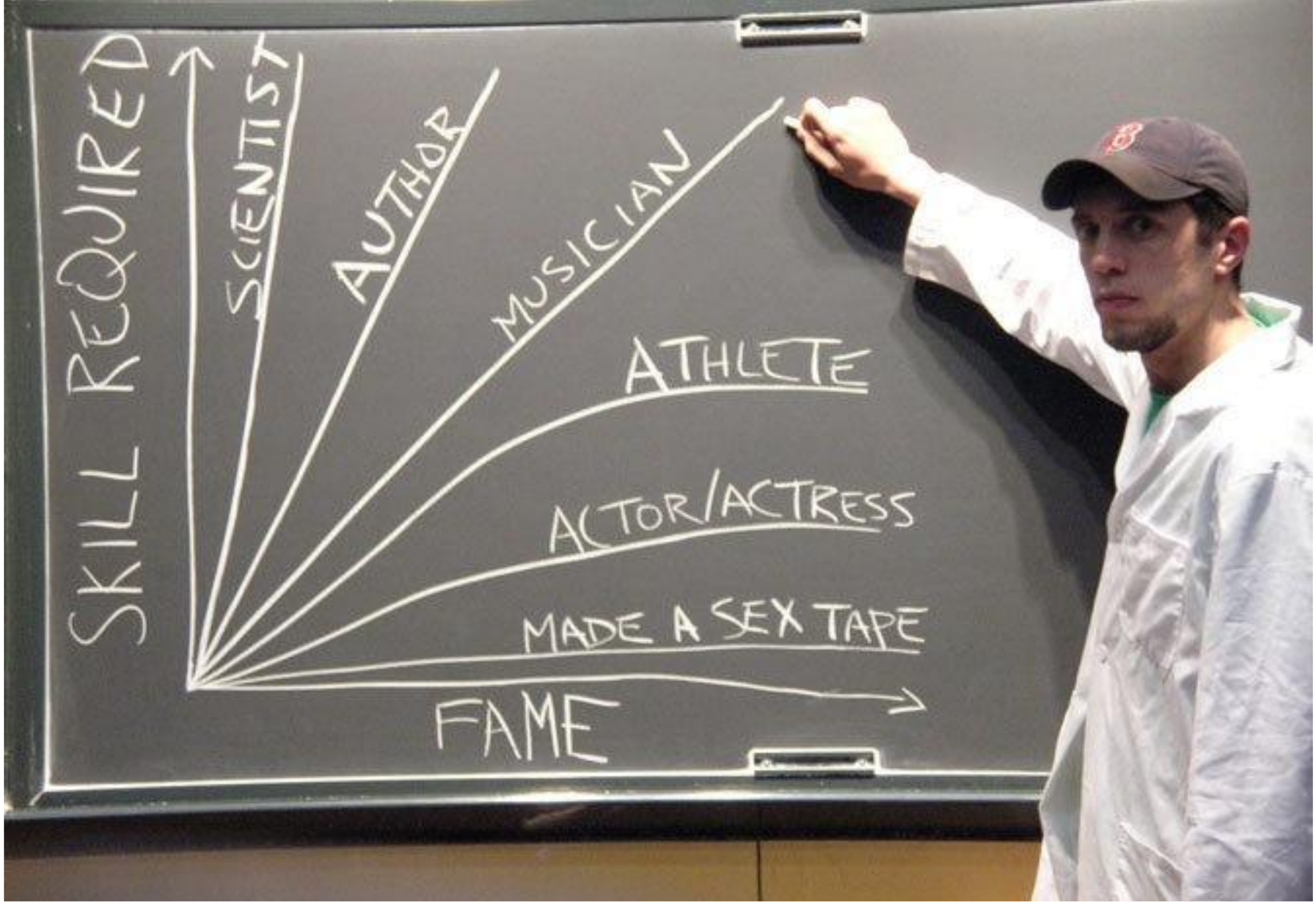
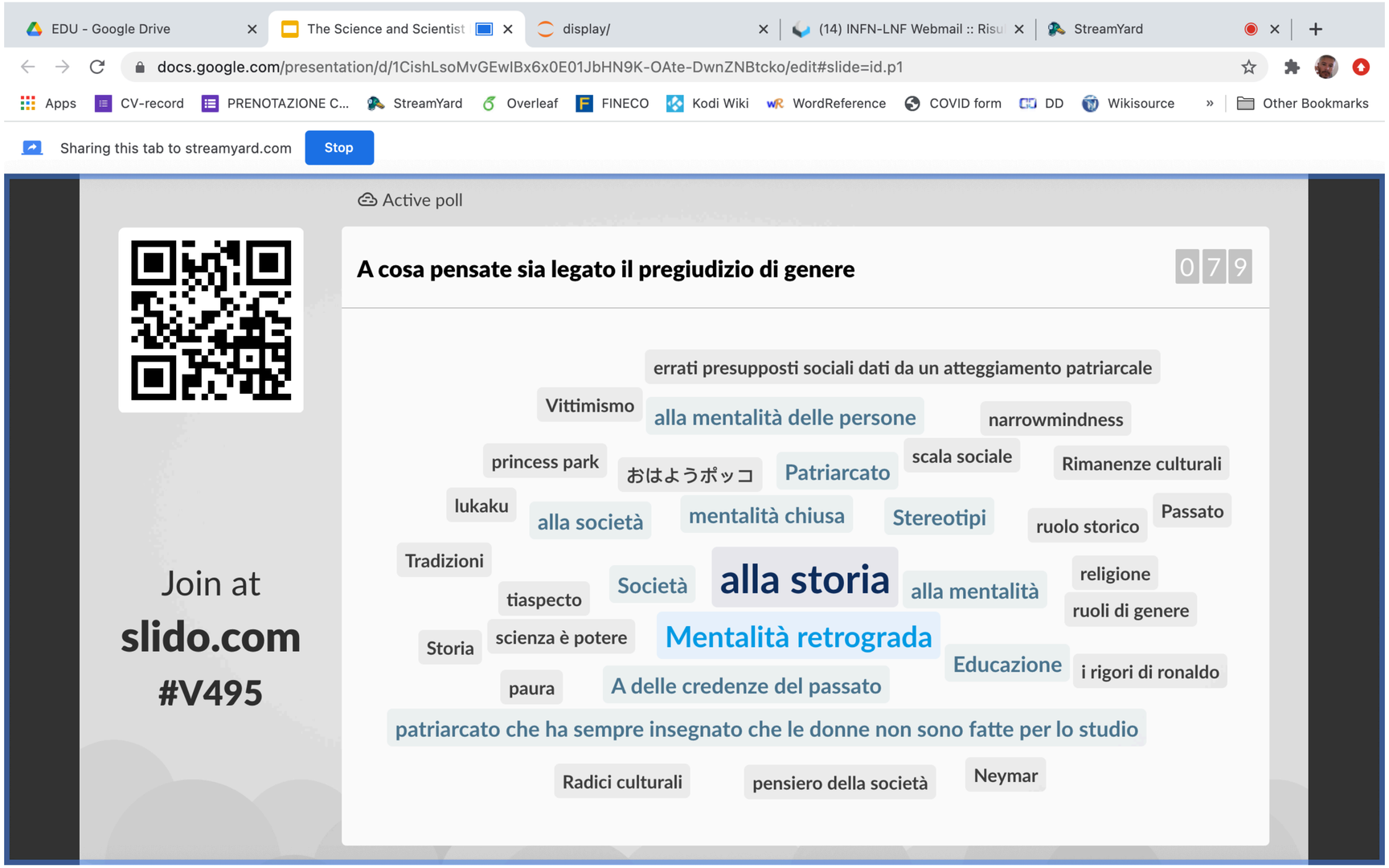
professori poco preparati
Talento
Vastità degli argomenti
Neymar
Le competenze di base e gli insegnanti
Matematica
La costanza
SAS
pregiudizi
L'idea della difficoltà
Tutto
non poterla capire completamente
la roma
Competenze
la
spiegazioni
Complessità
la difficoltà
la continuità
memorizzare tutto
dzeko
idk
Terminologia
L'approccio
Lo studio
VA95
Lota
Marre
La spiegazione
Teorie
L'apparente lontananza dalla realtà
Troppe formule da ricordare
La difficoltà dei vari argomenti
Orizzonti limitati
lo studio prettamente teorico

stereotype bias



age bias

gender bias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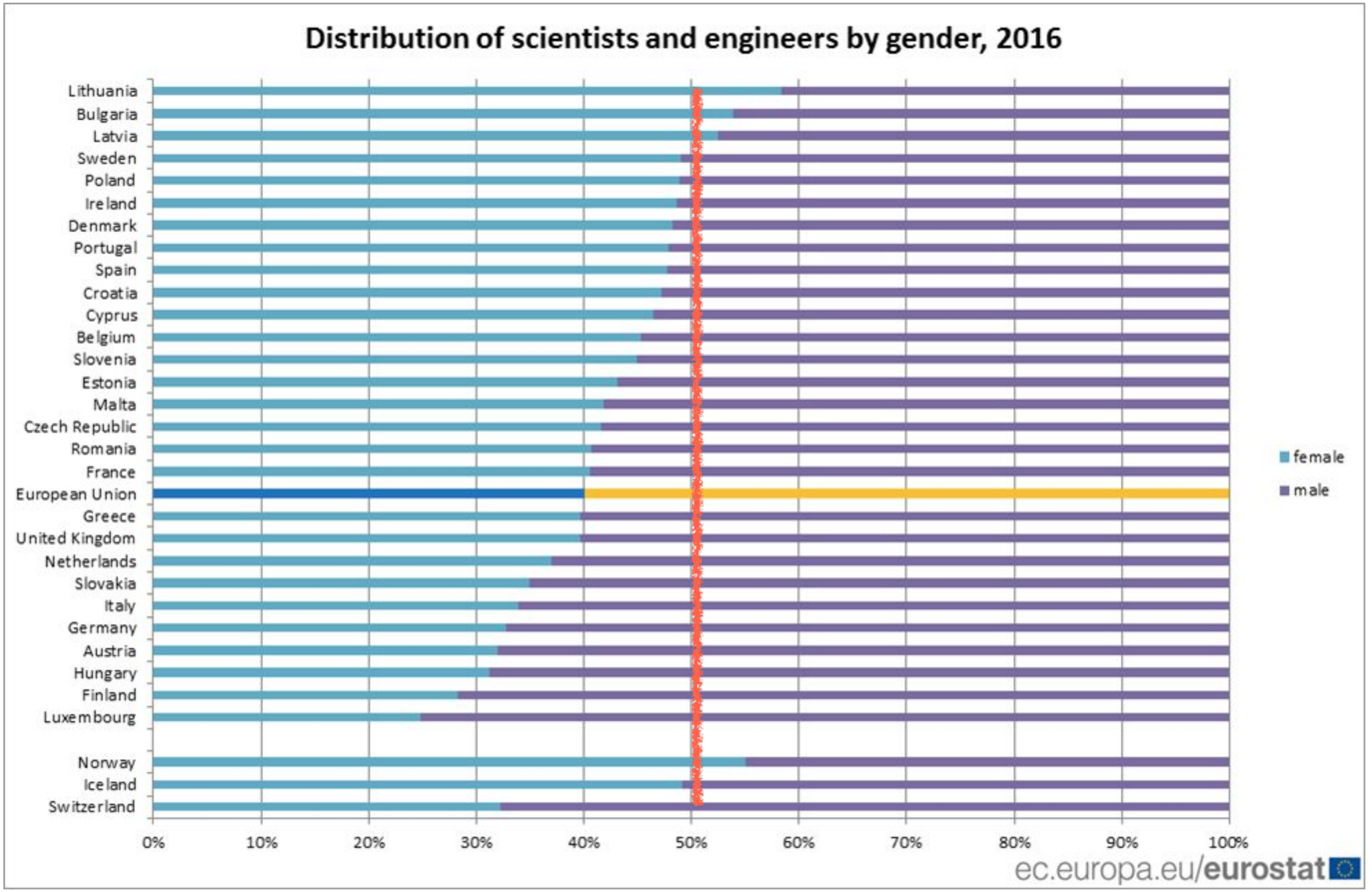
A cosa pensate sia legato il pregiudizio di genere
0 7 9
errati presupposti sociali dati da un atteggiamento patriarcale
Vittimismo
alla mentalità delle persone
narrowmindness
princess park
おはようポッコ
Patriarcato
scala sociale
Rimanenze culturali
lukaku
alla società
mentalità chiusa
Stereotipi
ruolo storico
Passato
Tradizioni
Società
alla storia
alla mentalità
religione
tiaspecto
ruoli di genere
Storia
scienza è potere
Mentalità retrograda
Educazione
i rigori di ronaldo
paura
A delle credenze del passato
patriarcato che ha sempre insegnato che le donne non sono fatte per lo studio
Radici culturali
pensiero della società
Neymar



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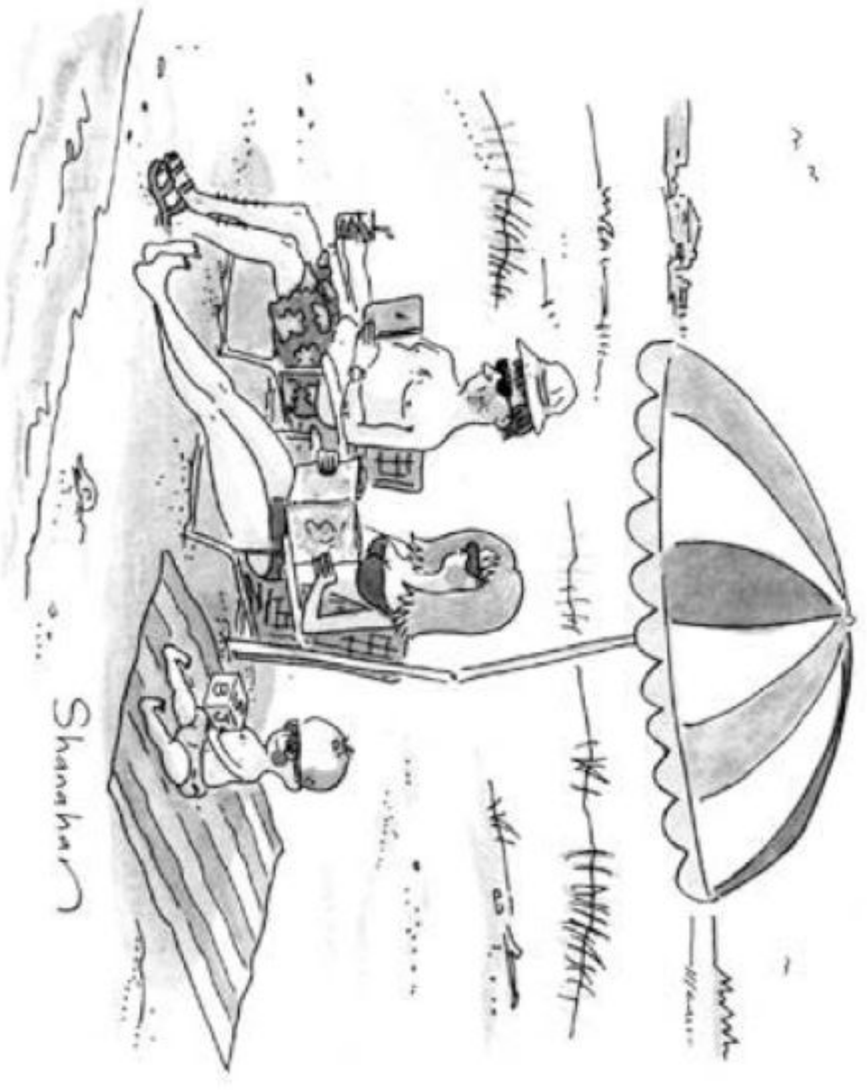
technological bias



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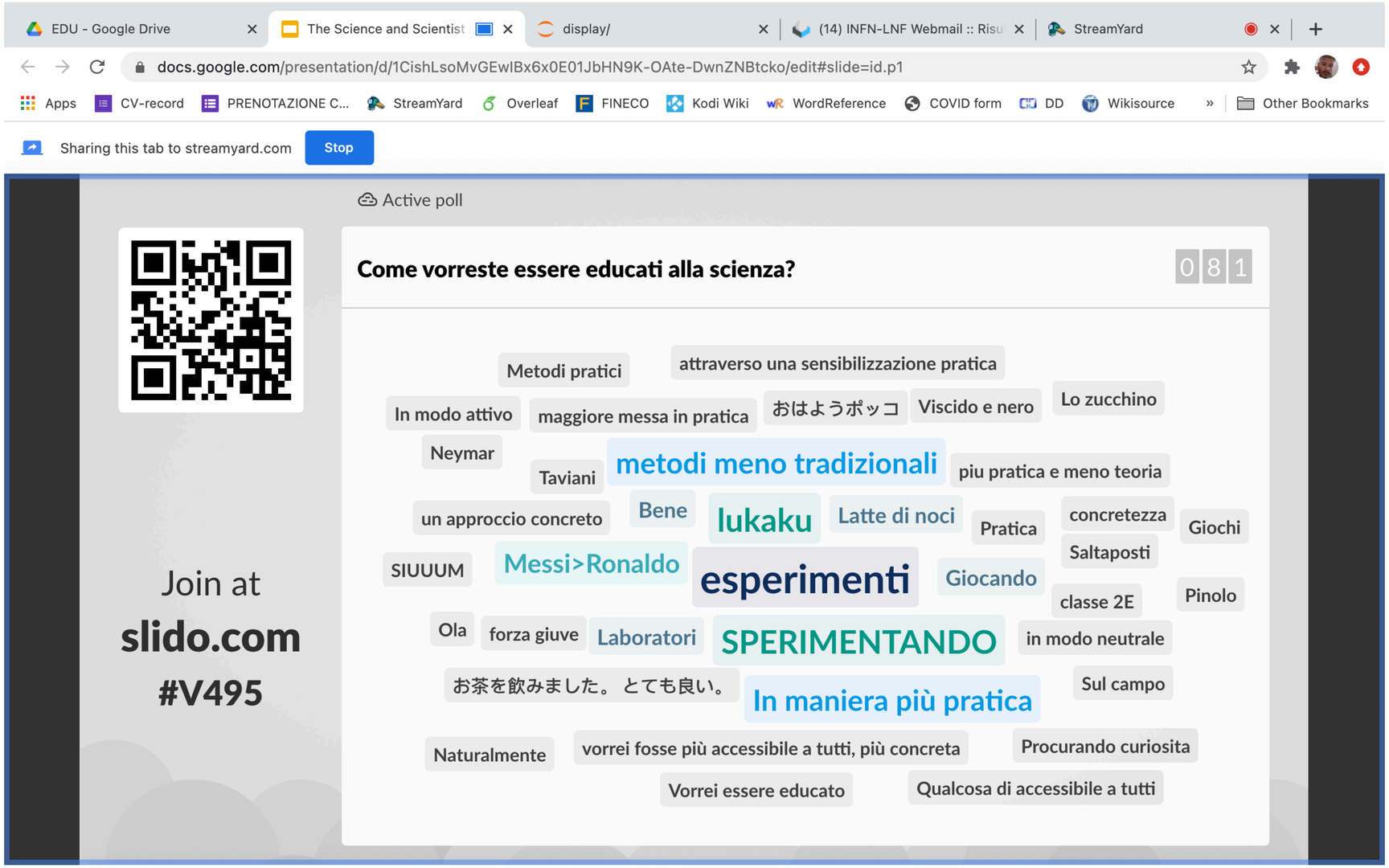
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Come vorreste essere educati alla scienza?
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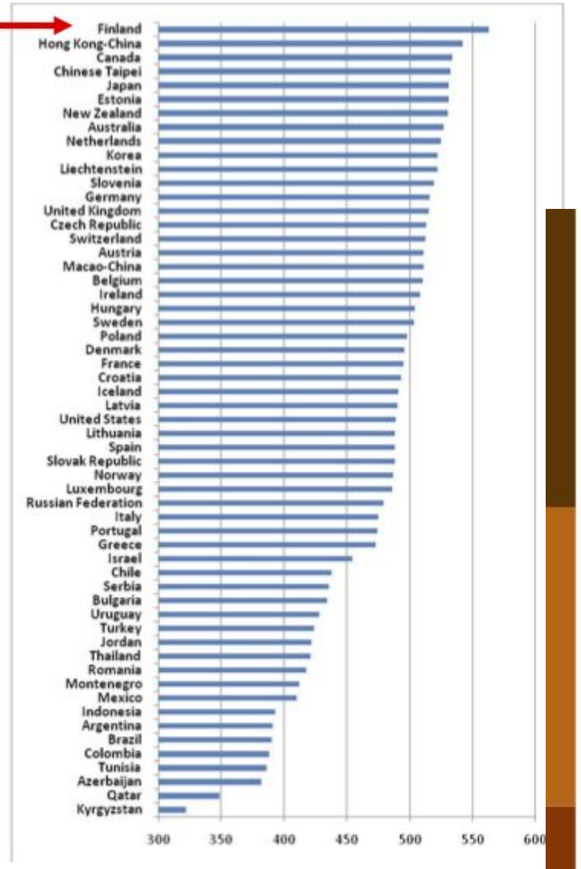
Metodi pratici
attraverso una sensibilizzazione pratica
In modo attivo
maggiore messa in pratica
おはようポッコ
Viscido e nero
Lo zucchino
Neymar
Taviani
metodi meno tradizionali
piu pratica e meno teoria
un approccio concreto
Bene
lukaku
Latte di noci
Pratica
concretezza
Giochi
SIUUUM
Messi>Ronaldo
esperimenti
Giocando
Saltaposti
classe 2E
Pinolo
Ola
forza giuve
Laboratori
SPERIMENTANDO
in modo neutrale
お茶を飲みました。とても良い。
In maniera più pratica
Sul campo
Naturalmente
vorrei fosse più accessibile a tutti, più concreta
Procurando curiosita
Vorrei essere educato
Qualcosa di accessibile a tutti

methodology bias

Finland:
Highest science score

PISA 2006
Science mean score

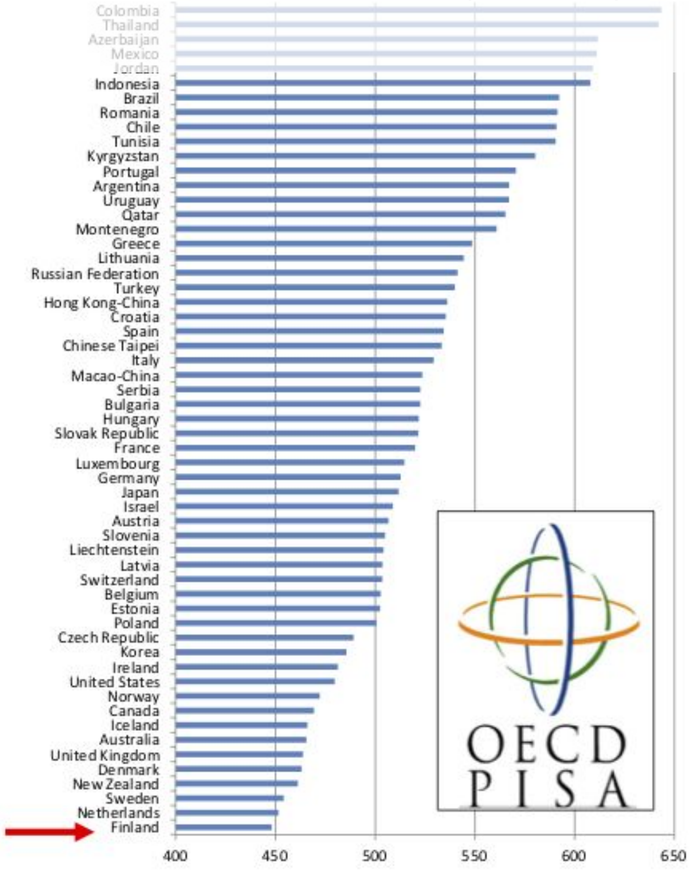


OECD PISA

credits Prof Svein Sjøberg UiO

The Programme for International Student Assessment (PISA) is a worldwide study by the Organisation for Economic Co-operation and Development (OECD) in member and non-member nations intended to evaluate educational systems by measuring 15-year-old school pupils' scholastic performance on mathematics, science, and reading

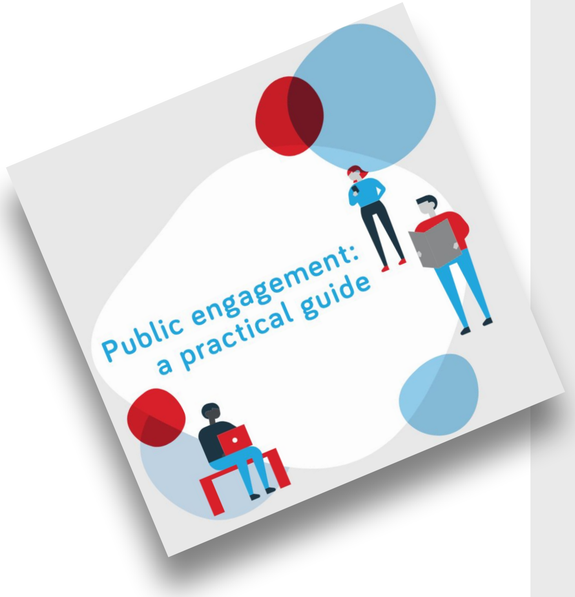
PISA 2006
Science *Interest* score



Finland:
Highest in science score,
lowest in interest

OECD PISA

	Deficit	Dialogue	Participation
Main Focus	Public ignorance and technical education	Dialogue, engagement, transparency, building trust	Direction, quality and need for sociotechnical change
Key Issues	Communicating science, informing debate, getting the facts straight	Re-establishing public confidence, building consensus, encouraging debate, addressing uncertainty	Setting science and technology in wider cultural context, enhancing reflexivity and critical analysis
Communication style	One-way, top-down	Two-way, bottom-up	Multiple stakeholders, multiple frameworks
Model of scientific governance	Science-led, 'science' and 'politics' kept apart	Transparent, responsive to public opinion, accountable	Open to contested problem definitions, beyond government alone, addressing societal concerns and priorities
Sociotechnical challenge	Maintaining rationality, encouraging scientific progress and expert independence	Establishing broad societal consensus	Viewing heterogeneity, conditionality and disagreement as a societal resource
Overall perspective	Focusing on science	Focusing on communication and engagement	Focusing on scientific/ political cultures
Emphasis	Content	Context	Content and Context
Aims	Transferring knowledge	Discussing implications of research	Setting the aims, shaping the agenda of research
Ideological contexts	Scientism;Technocracy; Rhetoric of the knowledge economy	Social responsibility; Culture	Civic science; Democracy



A five-step guide to involving the public in communicating your research.

1 **Scoping**

Look at what people are saying and the underlying assumptions.

2 **Involving people**

Work out the significance for different groups and how to involve them.

3 **Planning**

Propose content and formats that are relevant for the people accessing it.

4 **User-testing**

Develop your material together.

5 **Dissemination**

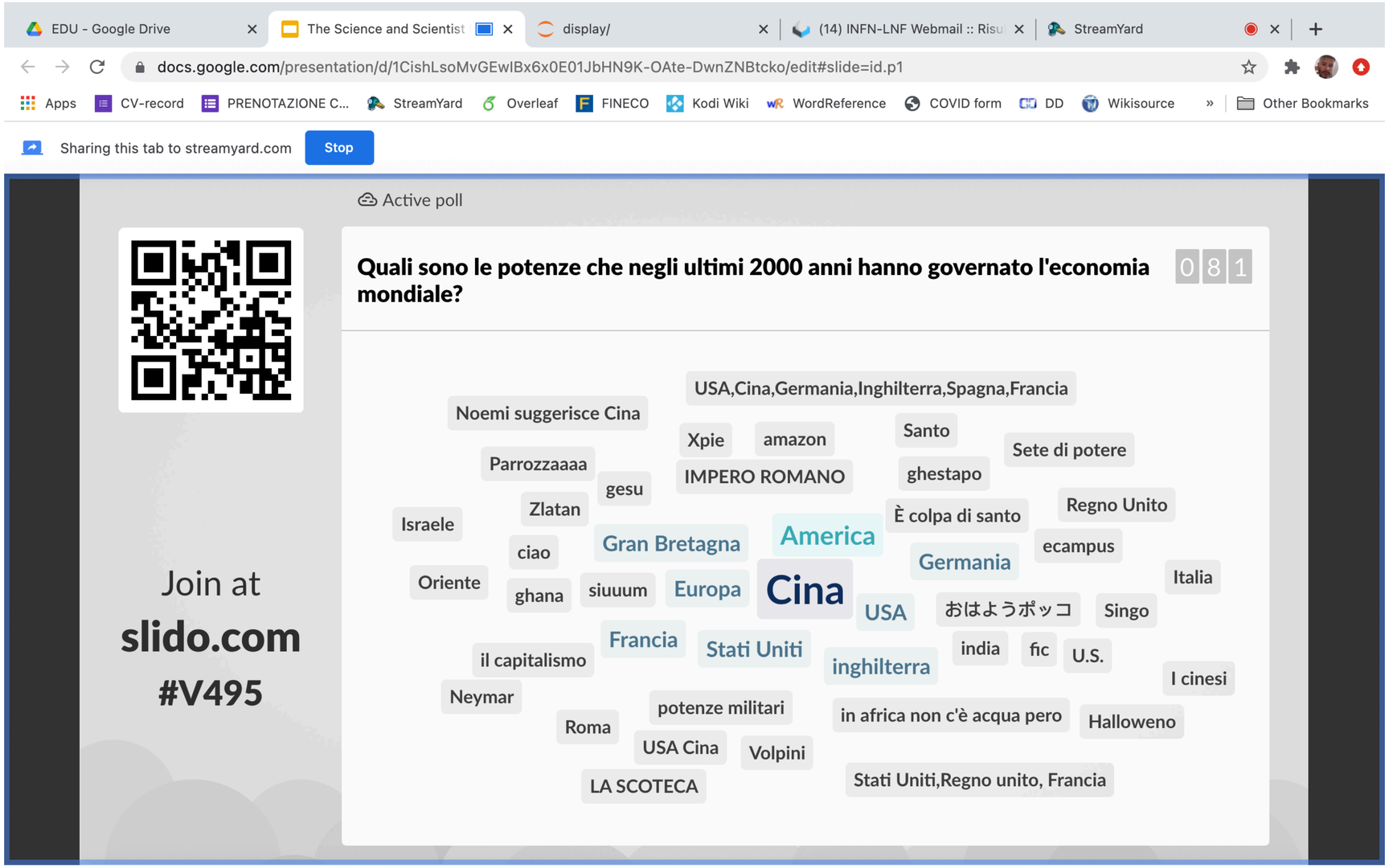
Continue to engage people and use feedback.

SENSE about SCIENCE

NHS National Institute for Health Research

http://senseaboutscience.org/activities/public-engagement-guide/

social bias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Quali sono le potenze che negli ultimi 2000 anni hanno governato l'economia mondiale?
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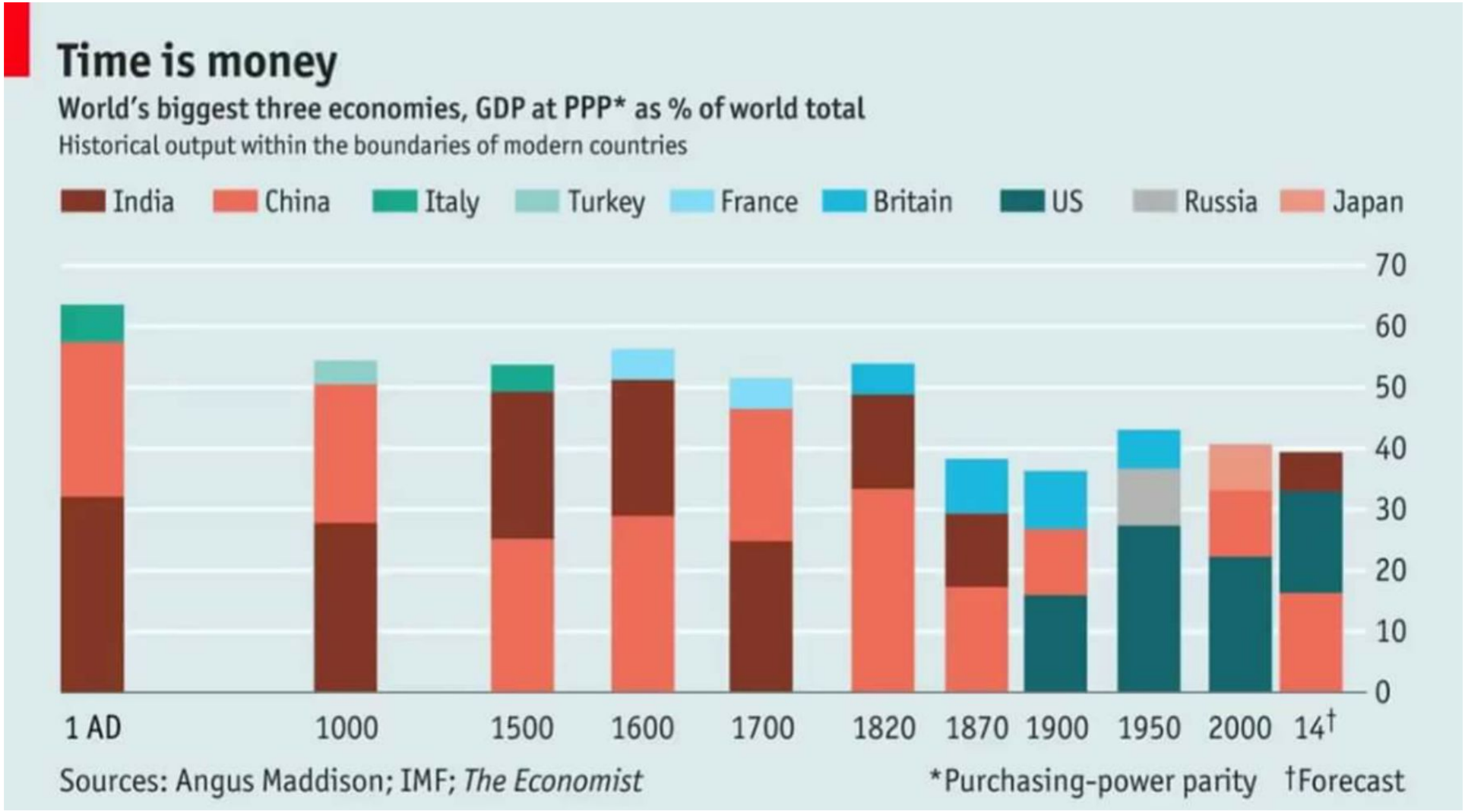
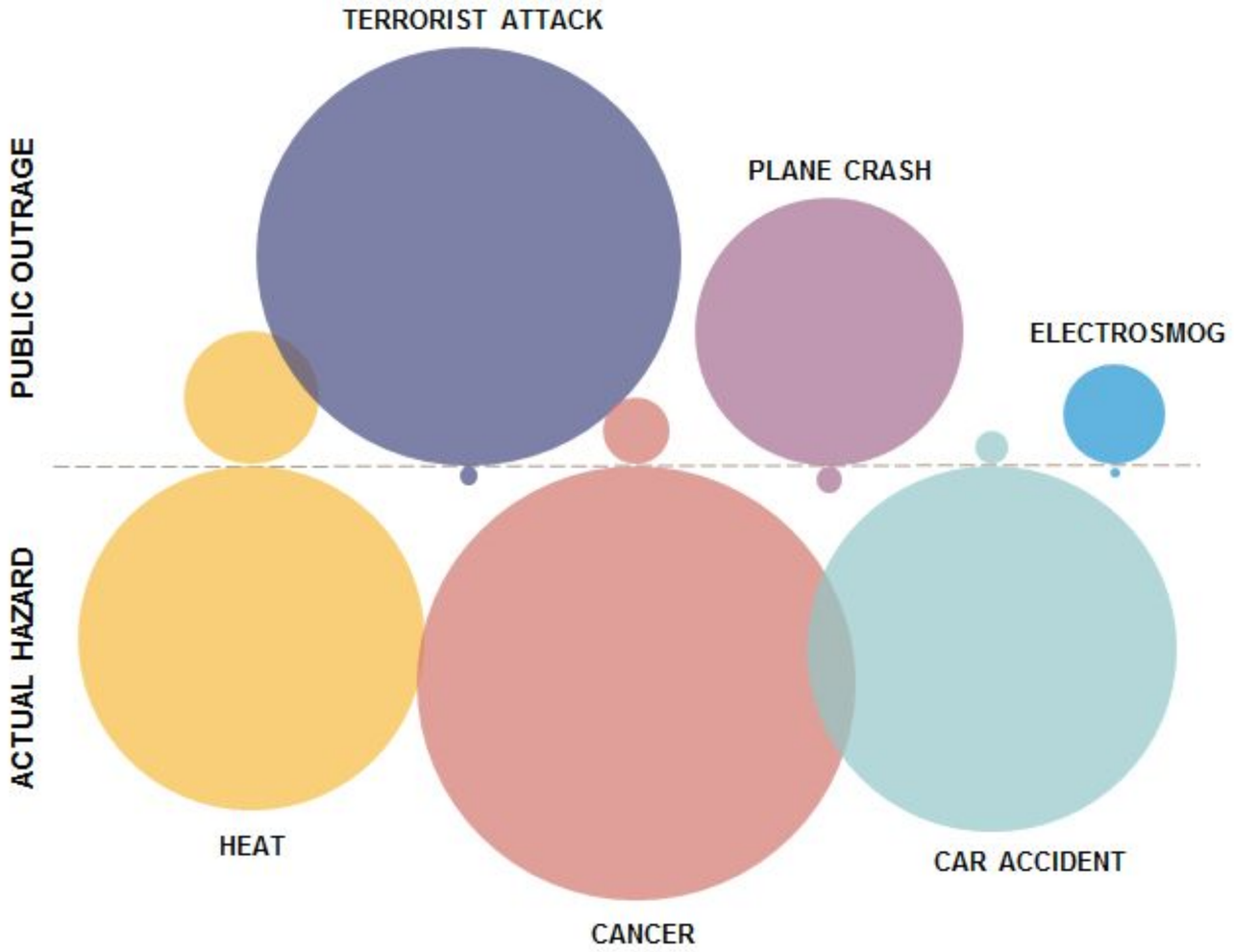
USA,Cina,Germania,Inghilterra,Spagna,Francia
Noemi suggerisce Cina
Xpie
amazon
Santo
Sete di potere
Parrozzaaaa
IMPERO ROMANO
ghestapo
gesu
Zlatan
Israele
È colpa di santo
Regno Unito
Gran Bretagna
America
ciao
ecampus
Germania
Oriente
Cina
Italia
ghana
siuuum
Europa
USA
おはようポッコ
Singo
Francia
Stati Uniti
india
fic
U.S.
il capitalismo
inghilterra
I cinesi
Neymar
potenze militari
in africa non c'è acqua pero
Halloweno
Roma
USA Cina
Volpini
LA SCOTECA
Stati Uniti,Regno unito, Francia

scientific literacy



the Economist

don't be the turkey



[…] There is a risk of ending up like **Bertrand Russell and Karl Popper's** famous Inductivist Turkey.

Russell presented the example of a turkey that was very well cared for, receiving food and water every day. The turkey got used to this **comfortable situation, feeling increasingly secure and confident**. The turkey's trust grew every day before being broken suddenly (and tragically, at least from the point of view of the turkey) on **Thanksgiving Day!**

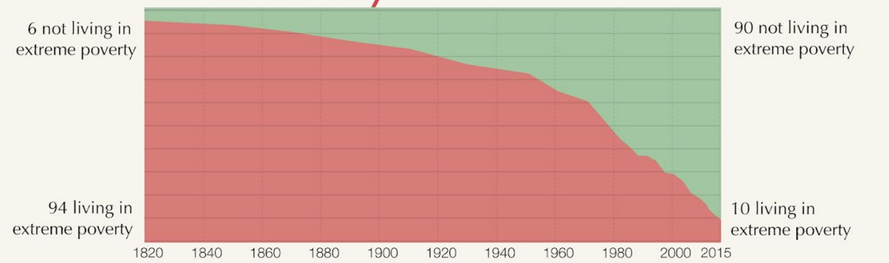
Russell used the poor turkey to demonstrate the **inductivist trap**: the **risk of believing that the past** contains all the useful information we need on the future. […]

https://www.gam.com/en/our-thinking/investment-opinions/anti-panic-manual--dont-be-the-turkey

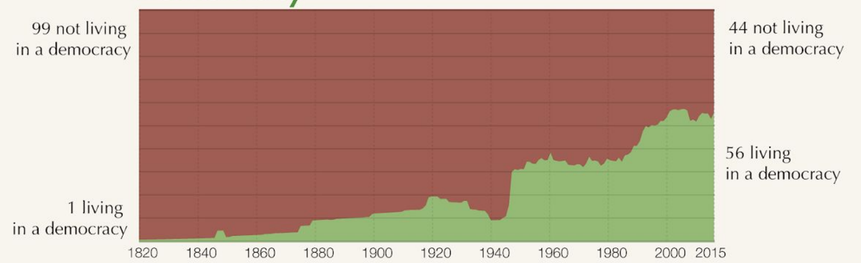
The World as 100 People
over the last two centuries

Our World in Data

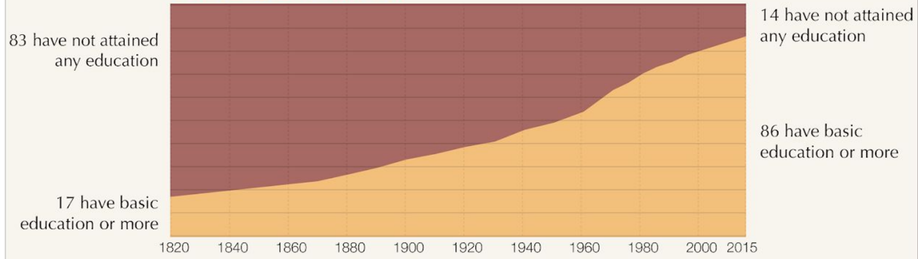
Extreme Poverty



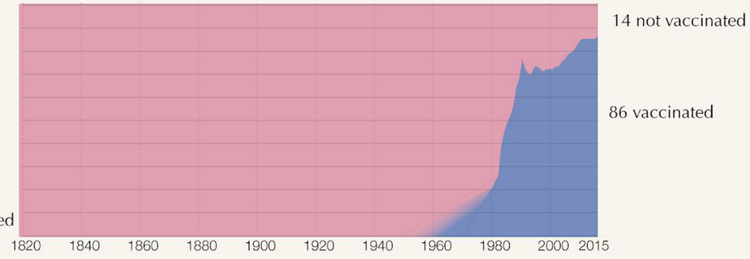
Democracy



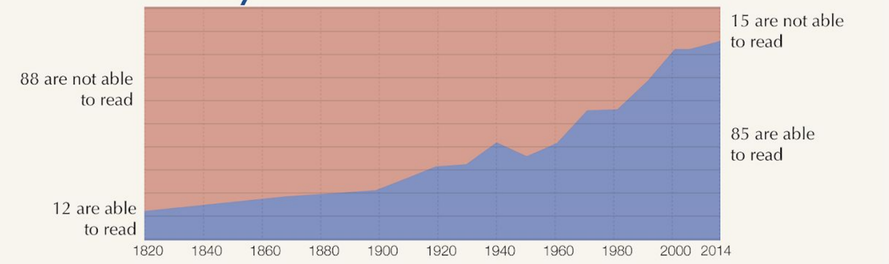
Basic Education



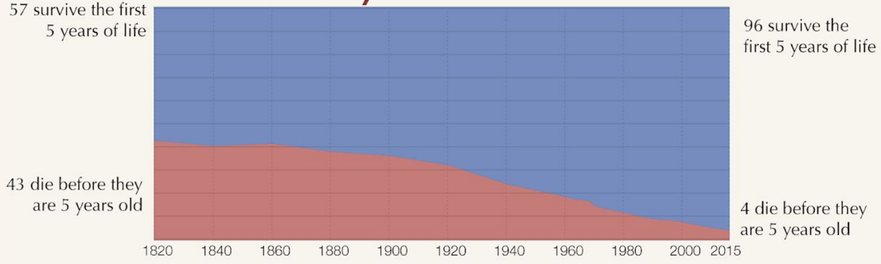
Vaccination against diphtheria, pertussis (whooping cough), and tetanus



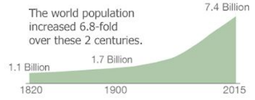
Literacy



Child Mortality



Data sources:
Extreme Poverty: Bourguignon & Morrison (2002) up to 1970 – World Bank 1981 and later (2015 is a projection).
Vaccination: WHO (Global data are available for 1980 to 2015 – the DPT3 vaccination was licenced in 1949)
Education: OECD for the period 1820 to 1960. IIASA for the time thereafter.
Literacy: OECD for the period 1820 to 1990. UNESCO for 2004 and later.
Democracy: Politiy IV index (own calcluation of global population share)
Colonialism: Wimmer and Min (own calcluation of global population share)
Continent: HYDE database
Child mortality: up to 1960 own caluclations based on Gapminder; World Bank thereafter



https://ourworldindata.org/a-history-of-global-living-conditions-in-5-charts/

bias in science communication

- stereotype bias
- age bias
- gender bias
- technological bias
- methodology bias (literacy)
- social bias

the risks of a science popularisation & evolution due to society evolution

- concern about science: vaccines, autism, GMO, homeopathy, xylella history, …
- feedback risks: turkey example, funds coercion, science freedom limitation, …
- exploitation of science and science results (positive or negative) to argue “my” theses: conspiracy theories, democracy, populism…
- science projects evaluation, Journal Impact Factor, predatory publishers: fake paper (open-source-pear review) and conferences…

Eurobarometer: PUBLIC PERCEPTIONS OF SCIENCE, RESEARCH AND INNOVATION

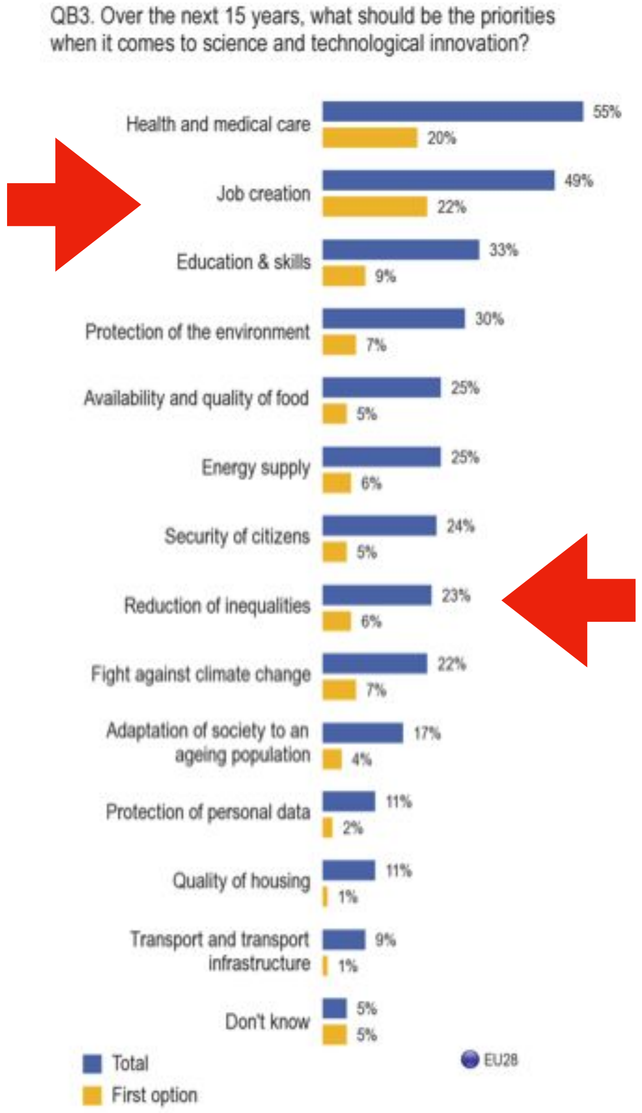
"On most issues, respondents in all countries are more likely to think that **positive impacts** can be achieved through science and innovation than through people's actions and behaviour. A **notable exception is the reduction of inequalities**, which is seen in most countries as more of an area for human intervention.

The issue of **job creation** is one of the two most prioritized by **Europeans when they are asked which issues science and technology innovation should focus on over the next 15 years**. However, respondents in some countries tend to believe less in the capacity of science and technological innovation to have a positive impact on this issue […]

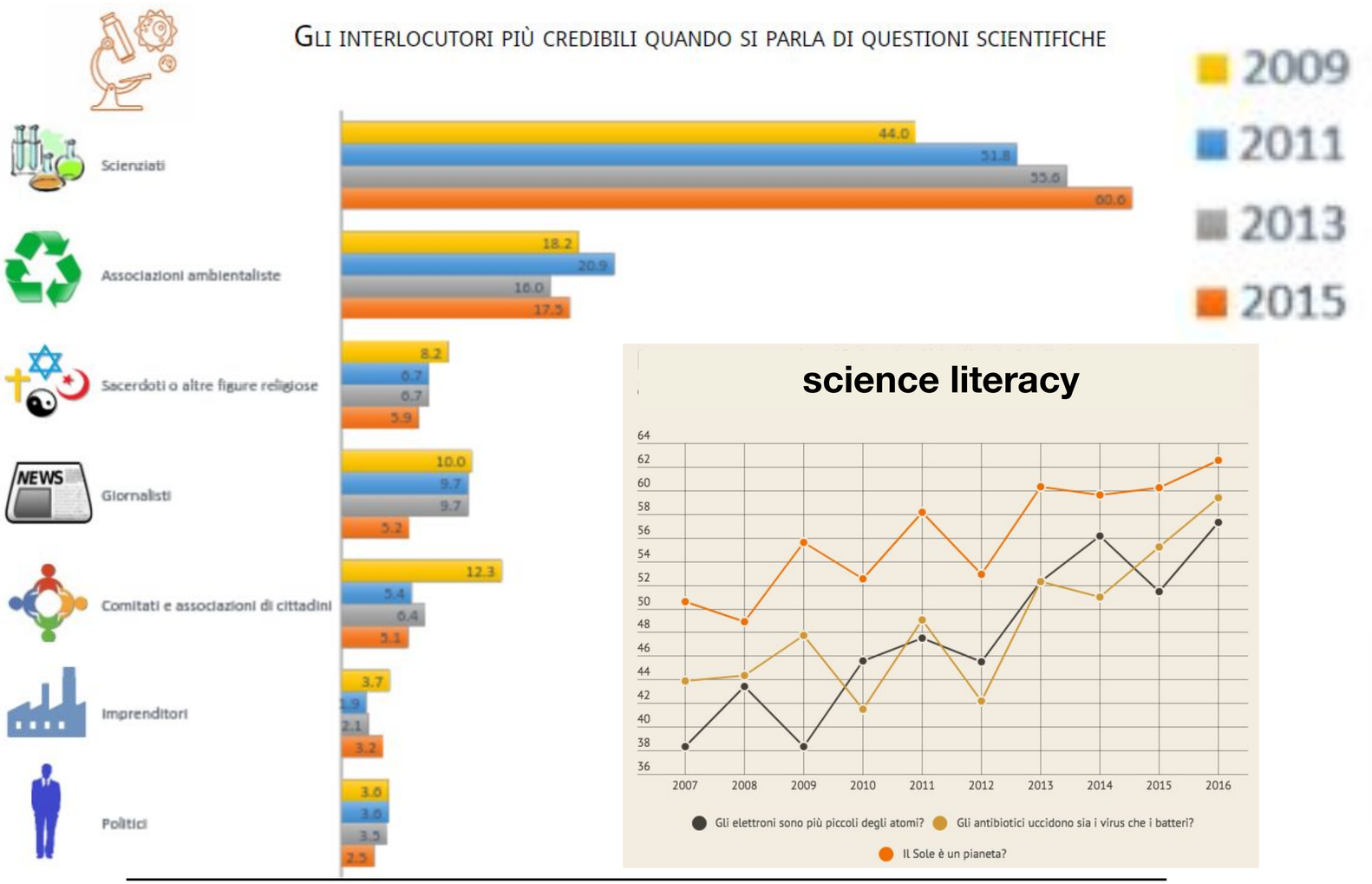
However, there are **substantial differences from country to country** when it comes to the expectation of whether **science and innovation**, and also people's actions and behaviour, can have positive impacts. Respondents in some countries are **very optimistic** about these issues, notably those in the **Nordic countries, Ireland, Malta and Spain**.

On the other hand, respondents in **Austria, the Czech Republic, Germany, Greece and Italy** have consistently lower expectations that there will be positive changes over the next 15 years either through science and technological innovation or through the behaviour of citizens."

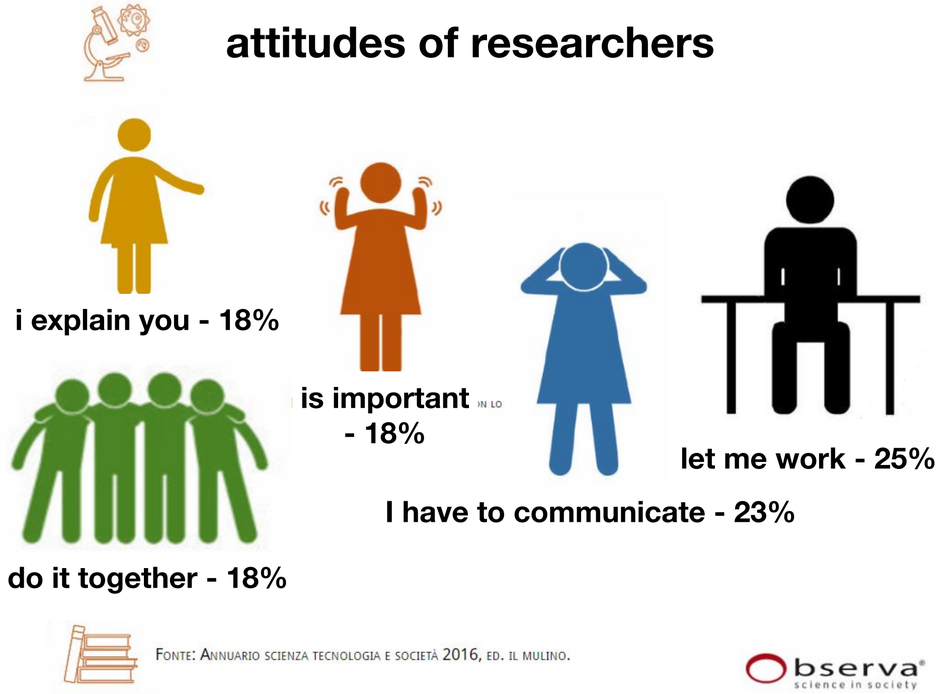
http://ec.europa.eu/commfrontoffice/publicopinion/index.cfm



impact of science communication



people interviewed believes this is mainly related to the growth of information, science manifestation, science shows and the closer connection with researchers.



FONTE: ANNUARIO SCIENZA TECNOLOGIA E SOCIETÀ 2016, ED. IL MULINO.

Observa science in society

Giornata Women in Science 2021, LNF-INFN
reference: https://arxiv.org/abs/1905.02936

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