Using MOOCs to Debunk Climate Misinformation for a Global Classroom

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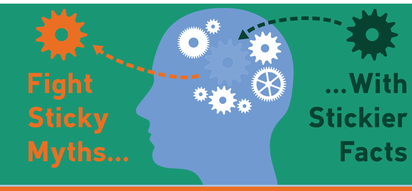
MOOCs (Massive Open Online Courses) are a powerful way to educate a large, diverse audience. The MOOC *"Making Sense of Climate Science Denial"* applies misconception-based learning and psychological principles in videos debunking the most common myths about climate change. As well as teaching fundamental climate science, the course explains the psychology of climate science denial and the most effective techniques for responding to misinformation. This interdisciplinary online course has had over 25,000 enrolments from over 160 countries. A number of enrolled students were secondary and tertiary educators, who adopted the course content in their own classes.

Structure of an Effective Debunking

All debunking lectures (see right for examples) adopted the fact-myth-fallacy format.

FACT
Replace the myth with a factual alternative. Ideally, your fact needs to be more compelling and memorable than the myth.



MYTH/MISCONCEPTION
Warn people before mentioning the myth so they're cognitively on guard.

FALLACY
Explain the technique used by the myth to distort the fact using the five characteristics of science denial.

Video Lectures

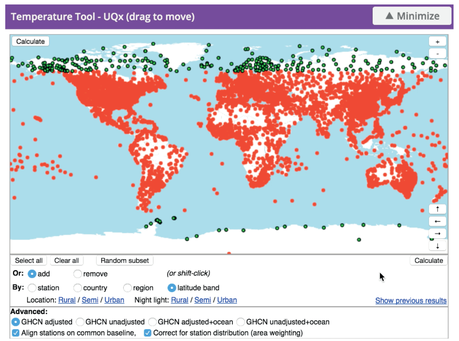
Youtube videos (around 7 minutes long) explain the basics of climate science while debunking common myths about climate change.

Expert Interviews

Interviews with leading scientists & communicators complement video lectures with more in-depth details.

Interactive Exercises

Online activities allow students to interact directly with climate and psychological data.



SCIENTIFIC CONSENSUS

FACT	MYTH	FALLACIES
Many independent human fingerprints have been observed across our climate.	"There is no empirical evidence that humans are causing global warming."	Misrepresentation: ignores the full body of evidence for human-caused global warming.
Multiple studies find that 97% of publishing climate scientists agree that humans are causing global warming.	"31,000 dissenting scientists show there's no scientific consensus on climate change."	Magnified minority: 31,000 is only 0.3% of over 10 million people with science degrees in the U.S. Fake experts: 99.9% of the 31,000 signatories are not climate scientists.

IT'S WARMING

FACT	MYTH	FALLACIES
Our planet has continued to build up heat since 1998. Global warming is still happening.	"Global warming stopped in 1998."	Cherry picking: looking at a single temperature record or a short period ignores the full picture.
Global warming is like rigging the weather dice, making it more likely to get hot days.	"It's cold outside, so global warming must have stopped."	Impossible Expectations: global warming doesn't mean no more cold weather, just fewer cold days compared to hot days.

WE'RE THE CAUSE

FACT	MYTH	FALLACIES
For thousands of years, our atmosphere has been in balance. Humans have upset the balance.	"Human CO_2 emissions are tiny compared to natural CO_2 emissions so our influence is negligible."	Over-simplification: considers only natural CO_2 emissions and ignores natural CO_2 sinks.
Satellites measure the warming effect from CO_2 – the increased greenhouse effect is an observed reality.	"CO_2 is a trace gas so its warming effect is minimal."	Red herring: trace amounts of substances can have a strong effect and this is irrelevant to the warming potential of CO_2.

PAST & FUTURE

FACT	MYTH	FALLACIES
Past climate change tells us climate is sensitive to the warming effect of CO_2.	"Natural climate change in the past implies current climate change is also natural."	Jumping to conclusions: past climate change actually sends the opposite message than what the myth concludes.
The IPCC is 20 times more likely to underestimate rather than exagerate climate impacts.	"Climate models and the IPCC are alarmist."	Cherry picking: selectively looks at a few examples where the IPCC overestimated climate change, ignoring the much larger number of examples of underestimation.

CLIMATE IMPACTS

FACT	MYTH	FALLACIES
Climate change is having negative impacts on all parts of society.	"Global warming is good."	Cherry picking: this focuses on a few good impacts of global warming and ignoring the overwhelming number of bad impacts.
Climate change impacts agriculture through extreme weather, heat stress and flooding.	"CO_2 is plant food."	Oversimplification: CO_2 fertilisation is just one factor affecting plant growth. The full picture shows that negative impacts outweigh benefits.

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