Communicating Science Effectively

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The two faces of science communication

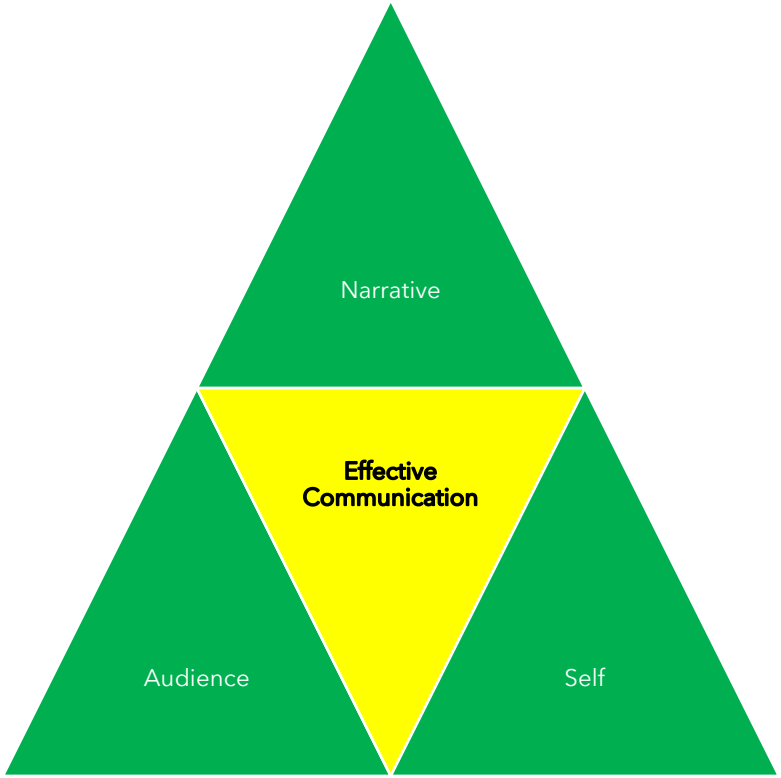
Inward-facing

Outward-facing


TASK 1: Save the Planet!
Each table represents a task force for the City of Esofonia
Remember: You are now in character!
It is your job to come up with the best possible climate change mitigation and adaptation strategies for your city
Each task force must decide on one idea in their allotted area and present it to their mayor
Each city will then vote on their best three options
You have 30 minutes!
ESOF16
SCIENC
CAREER
ESOF16

Presenting

The Triangle of Effective Communication



Adapted from: Peck, E., & Dickinson, H. (2009). *Performing leadership*. Springer.

Rhetoric

"The faculty of observing in any given case the available means of persuasion."

1. **Ethos** - is an appeal to **ethics** and it is a means of convincing someone of the character or credibility of the persuader.

2. **Logos** - is an appeal to **logic** and is a way of persuading an audience by reason.

3. **Pathos** - is an appeal to **passion** and is a way of convincing an audience of an argument by creating an emotional response.

Framing

"Frames organize central ideas, defining a controversy to resonate with core values and assumptions. Frames pare down complex issues by giving some aspects greater emphasis. They allow citizens to rapidly identify why an issue matters, who might be responsible, and what should be done."

Nisbet, M. C., & Mooney, C. (2007). Framing science. *Science*, *316*(5821), p. 56

In essence, framing theory suggests that how something is presented to the audience (i.e. the frame) influences how it is processed.

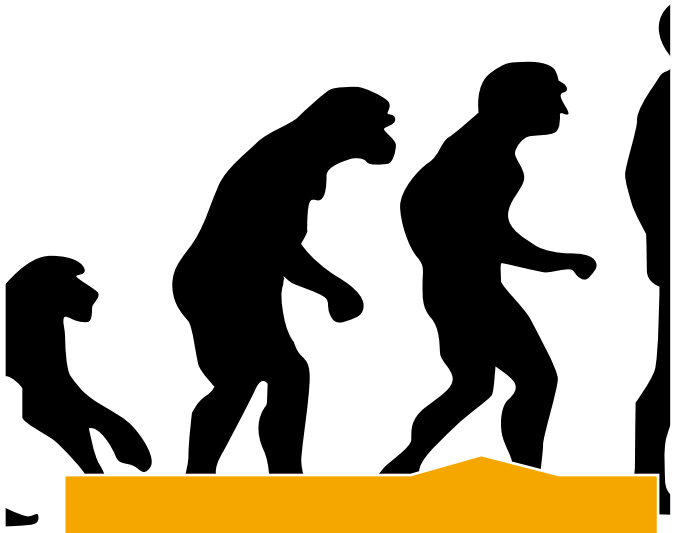
Framing in practice

A relatively well-known example of the framing effect is a 2009 study which found that while only **67%** of PhD students registered early for a particular conference when doing so was presented as a **discount**, **93%** did so when the emphasis was instead on a **penalty fee** for late registration.

Gächter, S., Orzen, H., Renner, E., & Starmer, C. (2009). Are experimental economists prone to framing effects? A natural field experiment. *Journal of Economic Behavior & Organization*, 70(3).

Framing science

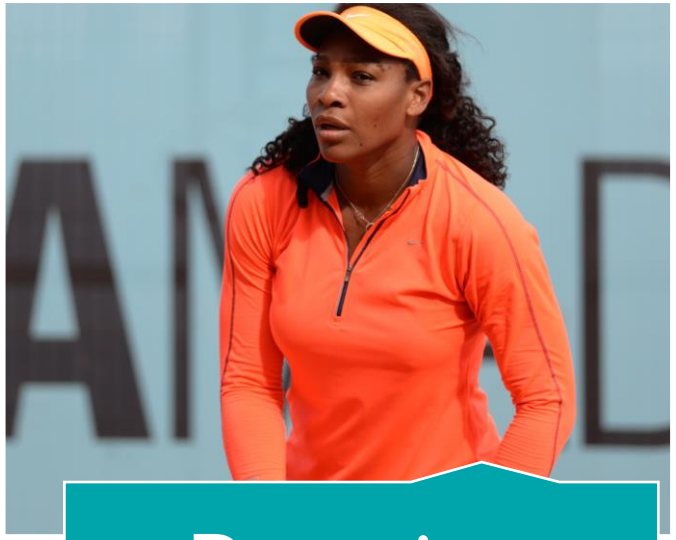
Climate Change



Evolution

Vaccinations

Dealing with nerves – before



Practise

Drink water

Relax

Dealing with nerves – during

Pause

Slow down

Eye contact

Dealing with nerves – after

Reflect

Treat

Be kind

Key messages

Remember the Triangle of Effective Communication: Narrative, Audience, Self

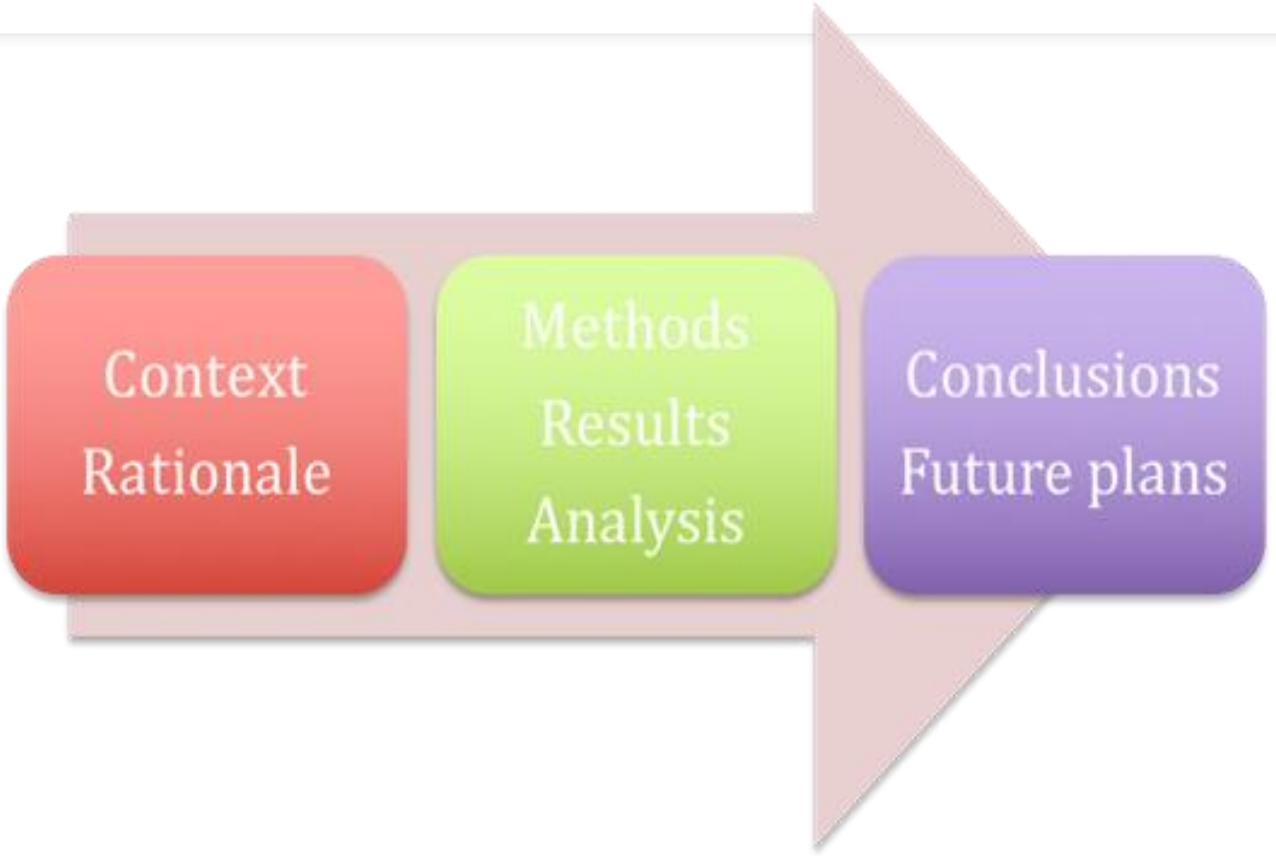
Use rhetoric to construct your narrative

Use framing to consider your audience

Be kind to yourself

Poster Design

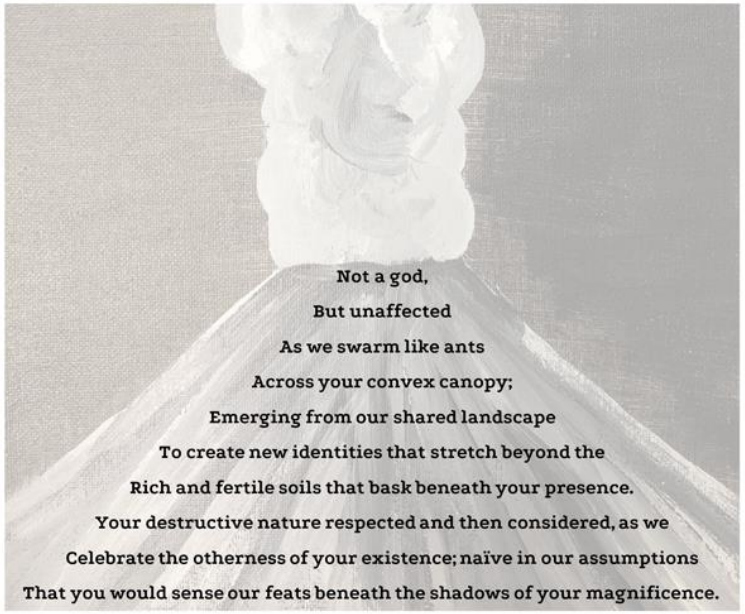
Use your structure to tell a story



Use text sparingly

Soldati, A., & Illingworth, S. (2020). In my remembered country: what poetry tells us about the changing perceptions of volcanoes between the nineteenth and twenty-first centuries. *Geoscience Communication*, *3*(1), 73-87.

Visual



Text

In this study we investigate what poetry written about volcanoes from the 1800s to the present day reveals about the relationship between volcanoes and the societies and times represented by poets who wrote about them, including how it evolved over that time frame. In order to address this research question, we conducted a qualitative content analysis of a selection of 34 English-language poems written about human–volcano interactions. Firstly, we identified the overall connotation of each poem. Then, we recognised specific emerging themes and grouped them in categories. Additionally, we performed a quantitative analysis of the frequency with which each category occurs throughout the decades of the dataset. This analysis reveals that a spiritual element is often present in poetry about volcanoes, transcending both the creative and destructive power that they exert. Furthermore, the human–volcano relationship is especially centred around the sense of identity that volcanoes provide to humans, which may follow from both positive and negative events. These results highlight the suitability of poetry as a means to explore the human perception of geologic phenomena. Additionally, our findings may be relevant to the definition of culturally appropriate communication strategies with communities living near active volcanoes.

Check your spelling and grammar

When you do have to use text, mke sure that there are no typoagraohsical errors, as otherwize your poster can look really unproffesional!

Use a colour wheel

Less is more

The evolution of McDonald's logos (McDonald's / The Atlantic)

Provide further info

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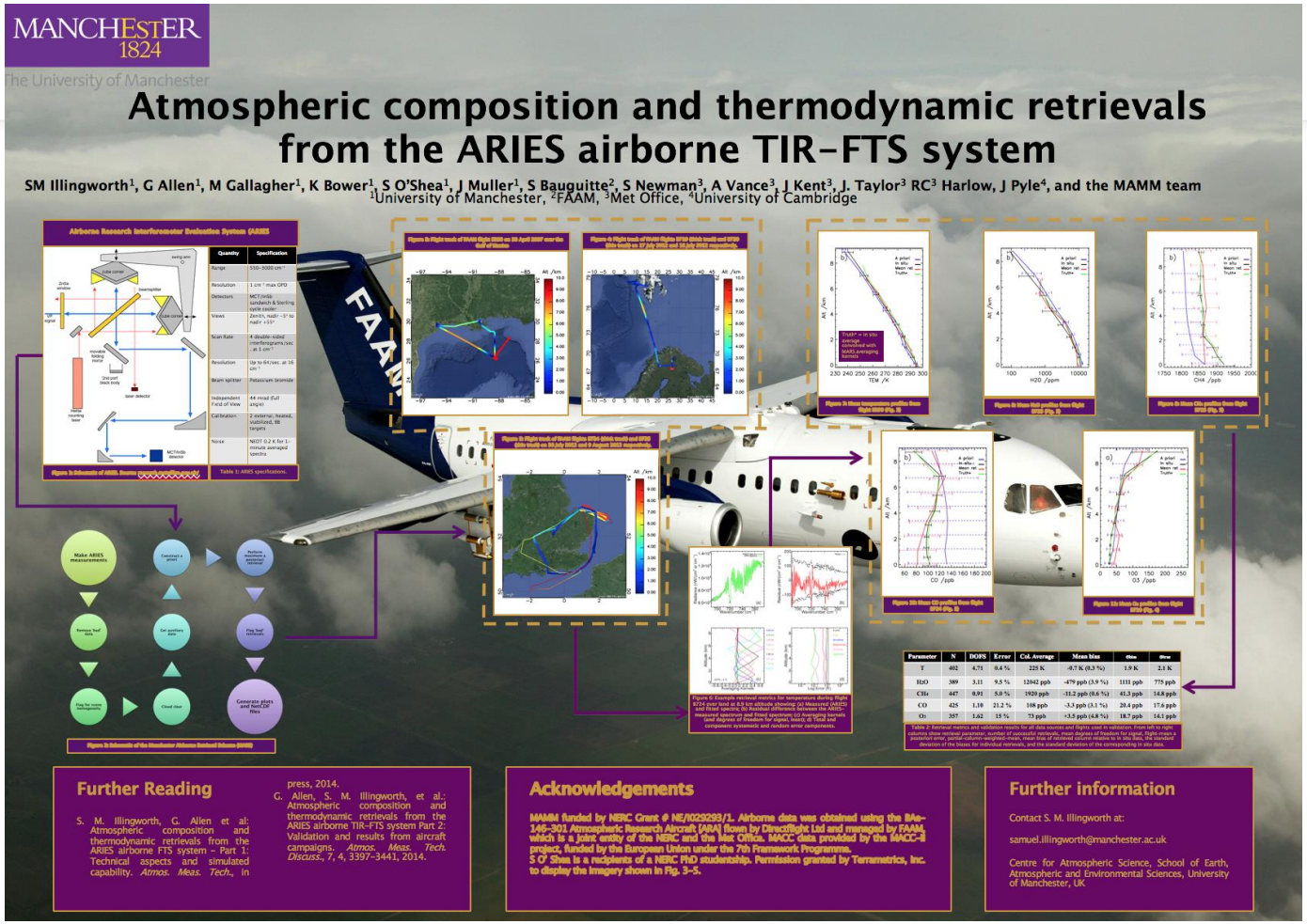
Is this a good poster?



Is this a good poster?

Manchester Metropolitan University

Interdisciplinary Learning Through the Teaching of Science and Art

Sam Illingworth[1], Jo Verran[1], Dave Griffiths[2], Annie Carpenter[2]
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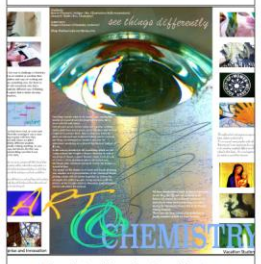
[1]Faculty of Science & Engineering, Manchester Metropolitan University, UK
[2]The Manchester School of Art, Manchester Metropolitan University, UK

Manchester Metropolitan University

Live Projects



Poster designed by students for end of project
(Photo Credit: Marie-Therese Widger & James Blyth)

What happened:
Over the summer of 2014, Art and Chemistry undergraduate students were paired up to create an interdisciplinary response to an external brief from a local museum, to be exhibited as part of Manchester Science Festival.

What was learned:
- Students could develop an understanding of learning perspectives derived from different disciplines.
- This helped them to reflect on their own approaches to process and development.
- 'Failure' was a concept that Art students seemed to more readily embrace.
- A number of difficulties arose, mainly because of logistical and communication issues.

More information:
Illingworth, S.M., McLean, M. and Patel, D., 2016. A Case Study of Interdisciplinary Live Projects in Art and Chemistry. *Brookes eJournal of Learning and Teaching*, 8.

Spectrum

Vibrio Fischeri exhibit
(Photo Credit: Hanieh Hazrati)

What happened:
In the spring term of 2016, undergraduate Art and Science students came together for lectures, workshops and seminars. They then created an exhibition for Manchester Art Gallery as part of the European City of Science celebrations.

What was learned:
- Students were able to develop complex lab skills in a short amount of time.
- An exploration of language used by both sets of students was extremely important.
- 'Design' as a process is very different for Art students studying design and Engineering students studying design.
- Extrinsic motivations were less important than thought (Science students did this as extracurricular work - up to 20 hrs a week!).

More information:
tinyurl.com/mmu-spectrum16

SciArt

3D model of a binary black hole system
(Photo Credit: Jaqueline De Godoy)

What happened:
A new cross-faculty unit for MSc and MA students at Manchester Metropolitan. Following a series of seminars, workshops and talks, students created original pieces of SciArt and exhibited them to the public at an event attended by over 350 people.

What was learned:
- Students embraced autonomous learning in an interdisciplinary environment.
- Facebook was an excellent tool for encouraging meaningful discussions beyond the classrooms.
- Talks from experienced practitioners helped to motivate students regarding their projects and future practice.
- More collaborative practice could have been encouraged for the pieces that were developed for the exhibition.

More information:
tinyurl.com/msc-scicomm17

Testing the Field

Looking for tardigrades
(Photo Credit: Annie Carpenter)

What happened:
In March 2017 a mixed group of Art and Science students went on a residential trip to a Permaculture centre. Using poetry, flower arranging, microscopes and home-made hydrophones the students worked together to explore their environment through an interdisciplinary lens.

What was learned:
- Creating an environment where there is no compulsory outcome is conducive to analytical development.
- Taking students outside of their usual comfort zones creates bonding experiences that can lead to interesting creative output.
- Learning in an informal environment can help to avoid cognitive overload.

More information:
middlewoodtrust.co.uk

The Future

Central Engine Maintenance Performance'
By Annie Carpenter (Photo credit: John Lynch)

What will happen:
- The SciArt unit is now a permanent option for both MSc and MA students.
- The continued development of our own interdisciplinary research and practice.
- A detailed analysis of the student's evaluation of *Testing the Field* and the *SciArt* unit.

What we hope to learn:
- How can we design a cross-faculty curriculum that embeds art and science literacy through a 3-year undergraduate experience?
- What is the most effective way to capture the long-term influence on the students involved in these initiatives?
- Can the interdisciplinary approaches that we have adopted be used to bring together students from other disciplines in a similar fashion?

More information:
samillingworth.com
davegriffiths.info
anniecarpenter.co.uk

Key messages

Have a clear narrative

Use less text

Check formatting

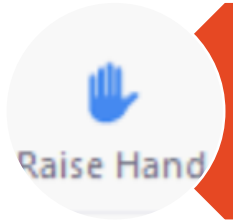
Provide further info

Presenting Digitally

Don’t forget the analogue

There are many publics

All voices should be heard



Attendance ≠ Engagement

Be interactive

Polls

Chat

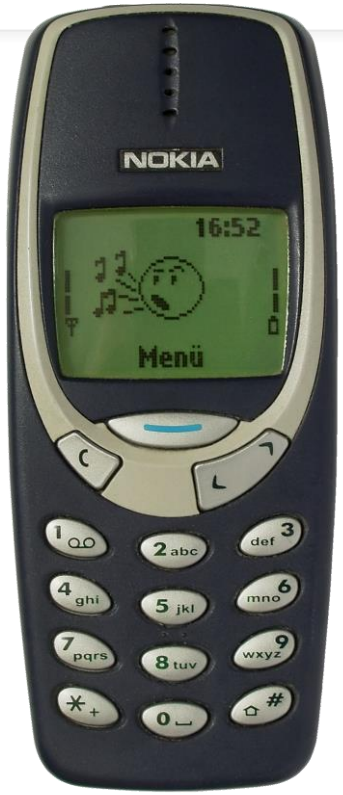
Q&A

Activities

Creativity

Interactive example

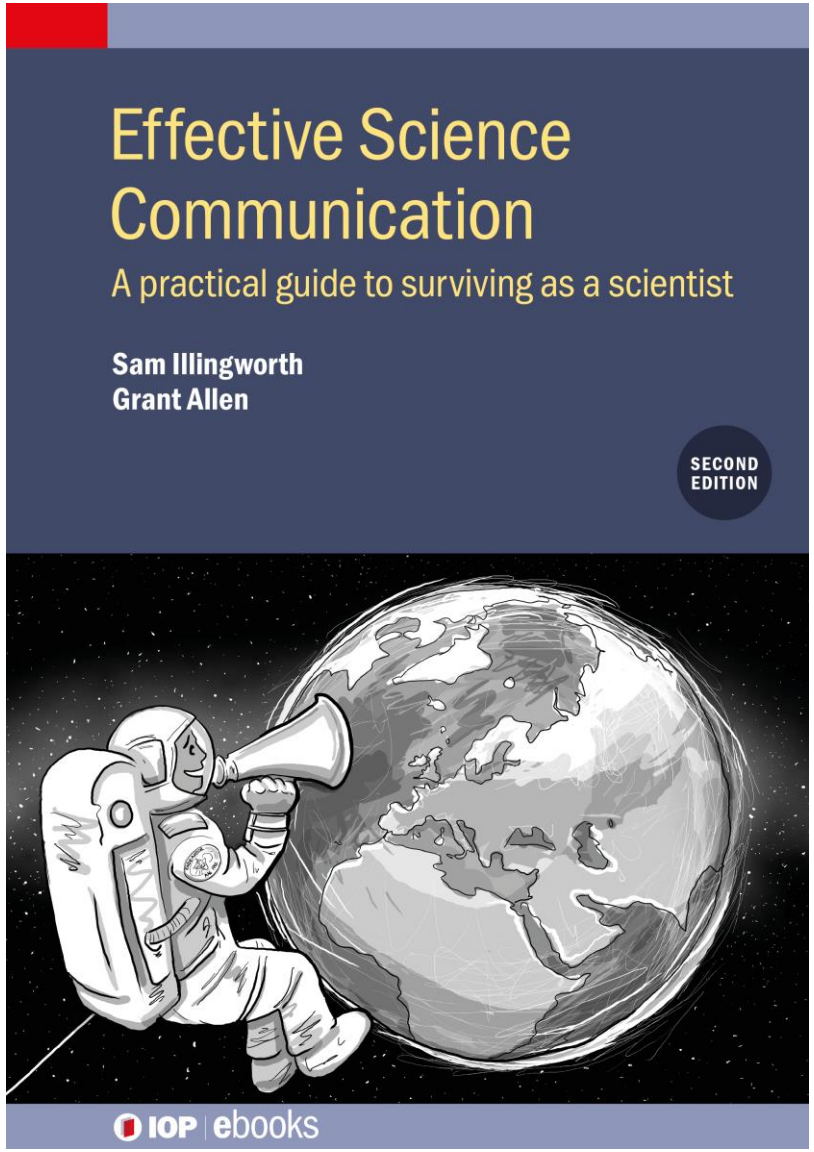
Remember all audiences



Key messages

- Don’t forget your analogue training
- Pick a platform that works for your audience
- Make the session interactive
- Create an environment in which **all** voices can be heard
- Be creative

Further reading



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