Scientist as Storyteller

How to Give an Effective Science Talk

Nairobi Air Quality Workshop

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Why Should Scientists be Good Communicators?

Convey relevance of your research.

Why is what you do important?

Increase impact of your research.

Talking about your research in an accessible way increases its use and relevance beyond scientific discovery.

Inspire the next generation of scientists.

We are ambassadors for science! If we can explain concepts, ideas, and findings clearly and enthusiastically, we increase the appeal and passion to pursue a career in science.

Curtail misinformation.

Now more than ever, we need to talk to the public about our science to work against fake news.

Funding.

If funding agencies can't understand our research and its relevance, they won't fund us.

Typical Science Presentations

Elevator Pitch (< 5 min).

Short talk to inspire further discussion and identify opportunities for collaboration. Focus on research findings and impact. (1-3 slides)

Conference (15-30 min).

New research (before published) to advertise new results, assess interest in research, and get criticisms and feedback from the science community (about 1 slide per minute).

Research Seminar (45 min).

Published and new research: published research advertises the work you've done and new research to show that you're still pushing the state of the science. (1 slide every 2-3 minutes)

Celebration or Outreach Talk (1 hour).

Broad and very accessible to a diverse audience. Mostly published work and how it has advanced the science.

This Talk.

Breaks a lot of the rules and guides I'll provide (too much text!!!)

You: The Storyteller

Know Your Audience.

First question when starting to prepare a talk: ***Who's my audience?***

Your audience determines what to present, what to avoid, and how much background to provide.

Remember that you've been working on this topic for months or years, but most of your audience is encountering this information for the first time.

Tell A Story.

The presentation should have the structure of a captivating story:

- Setting the scene (background)
- The buildup (materials and methods)
- The climax (results: moment of revelation)
- The denouement (final outcome, relevance and impact)

Show enthusiasm.

Enthusiasm is infectious. If you're not excited about the topic, your audience certainly won't be.

You: The Storyteller

Body Language.

Convey enthusiasm. Face (make eye contact with) the audience, not the screen.

Practice Makes Better.

Practice your talk at least once before presenting to keep on time, reduce nerves on the day, gain familiarity with the content, and ensure the talk has flow and cohesion.

Either ask a friend to give you helpful feedback or video record yourself and play it back to identify and eliminate nervous twitches and bad habits.

Keep on Time.

Stick to the time limit. Practicing the talk prevents this. Audiences get annoyed when talks run too long.

Nerves.

Inevitable! Let nerves work for you. Don’t let the laser pointer convey your nerves.

Laser Pointer.

Only use as much as is necessary (to direct the audience to a feature on the slide). Overuse is distracting.

Answering Questions

- Often a sign of a successful presentation is if the audience asks questions, so celebrate getting these.
- Answering well is a skill that improves with practice.
- Know your topic and material well to avoid the having to say “I don’t know”.
- Also avoid fumbling through an answer if you don’t have one. Your audience is discerning and knows when this is happening.
- When asked a question thank the audience member for the question.
- If you’re not sure what an audience member is asking or the rest of the audience may not have heard the question, repeat the question before answering. This also gives you time to think of a coherent answer.
- Keep answers brief and on topic so that there’s time for more questions.

Slides: General Best Practices

- **Less is more**. Keep slides simple so that main message is clear.
- Use a **plain background**. Avoid distracting Powerpoint slide templates.
- Keep **text to a minimum**. Only use when absolutely necessary.
- **Avoid bullet points** (unlike this talk!). Scientists are more excited to see images (time series, maps, scatter plots etc.)
- Use 18+ **font size** for text (sometimes smaller font size for figures).
- Use Arial-equivalent **font types**. Avoid decorative fonts that are hard to see, like Times New Roman.
- Powerpoint **Animations** are fine, but keep to a minimum. These can be distracting.
- **Videos** can be effective, but have a plan B in case these don't work.
- Each slide must **deliver a message** and the message must be clear (final line on the slide or title of the slide).
- Know everything you've added to the slide. Anticipate questions from the audience and be ready to answer them.
- **Acknowledge** data and literature sources and contributors (shows collegiality).
- Don't read your slides. Know what's on your slide by practicing the talk.

Slides: Order

Title Slide:

- Introduces you and your talk to the audience (the handshake)
- Should include your name, institution, collaborators, the date and talk title, and a catchy image.

Introduction/Background:

- Provides the audience with the information they need to follow your talk and appreciate why your work is important and advances scientific knowledge.

Research Slides:

- Make the main message of each slide clear. What is the key outcome of the research results?
- Images/figures must be clear and properly labelled.

Conclusion Slide:

- Outcomes from your work you want the audience to remember.
- For research students, this can also include future/ongoing work.

You: The Audience

Engage.

Remember you're not watching a television screen. It's a privilege to have a scientist share their research with you. Make them feel welcome.

It's only excusable to open your laptop or check your phone at large meetings, not at seminars.

Ask Questions.

A question is not an indicator of ignorance, but of curiosity.

Students and postdocs that ask questions at conferences get noticed!

Keep questions brief, clear, and concise. Avoid using this as an opportunity to tell people about your own research.

Asking questions can be intimidating. Write your question down during the talk. This is helpful to formulate the question more clearly.

Resources

Listen.

Podcasts: Science Magazine, Nature Magazine, RadioLab, Hidden Brain, You're the Expert, StarTalk.

Read (most important on this list!)

Peer-reviewed literature, Science/Nature books written by the public, newspapers (The Guardian), Science and Nature Magazine opinion and discussion pieces and blog posts (subscribe to their mailing lists).

Watch.

Science **documentaries** and **interviews**. Cosmos, Blue Planet, Planet Earth, PBS and BBC science specials.

Discuss.

Take opportunities to discuss your research with your colleagues, friends, family. Create a journal club to discuss a recently published or historical paper with your colleagues (and maybe invite your supervisor along!).

Other Resources

If I understood you, would I have this look on my face? Book on communicating science by Alan Alda

The Alda Centre for Communicating Science: https://www.aldacenter.org/

COMPASS: https://www.compasscicomm.org/who-we-are

Tips and pointers by Daniel Jacob (Harvard):
http://acmg.seas.harvard.edu/presentations/2006/gsf_presentation.ppt
http://acmg.seas.harvard.edu/presentations/2016/presentation_tips.ppt

How to give a dynamic scientific presentation:
https://www.elsevier.com/connect/how-to-give-a-dynamic-scientific-presentation

Steven Crammer's presentations guides (Harvard-Smithsonian):
https://www.cfa.harvard.edu/~scranmer/cranmer_htgat.html

Nature blog: http://blogs.nature.com/naturejobs/2017/01/11/scientific-presentations-a-cheat-sheet/

Regular *Science* and *Nature* opinion pieces, discussions, and blog posts

Your Homework Task

(1) Critique talks (even by professors...) during this workshop:

a. Assess whether these general rules were followed.

b. If these rules weren't followed, was it still an interesting talk?

c. What would you have done differently to improve the talk?

(2) Prepare an Elevator Pitch for Thursday

a. Present at the 2:30pm sessions

b. 1 slide (limited text); 90 sec

c. Content:
Introduce yourself; tell us the problem you are or want to address; tell us how you are addressing it

d. Make slide visually appealing (limited text, an image from your work)

e. Practice (and time) your talk