How to Write & Give Scientific Talks

Abigail Kopec, Katharina Vollmayr-Lee and Lucas Waddell
Bucknell University

July 9, 2024

Scientific Talk: Goals

Goal: convey the main ideas

$\longrightarrow$ be clear

$\longrightarrow$ communicate with your audience

Preparation:

- know your subject: discuss background with your mentor
- make the slides (see more below)
- use demos! (if possible)
- write a script for what you will say
- practice aloud: alone & for a friend or two
- time yourself: 12 min + 3 min for Q & A and for next speaker to get ready

Please feel free to ask for help!

Scientific Talks: Reflect on Previous Talks

Reflect on Previous Talks:

Take a few minutes and think about past **formal** scientific talks that you have seen. These could be conference talks, seminar talks, classroom lectures, etc., but should be more formal than our relaxed Friday research discussions.

Make two lists (at least 3 items in each list):

- one list for what was well done in some of the talks
- one list for what was not so well done in some of the talks

Include in your lists both content and other aspects of the presentations

Writing Your Talk: Tell a Story

Three BIG Questions

- What is your driving research question?
- What are your key result(s)?
- Why are these both important?

Formulate **SHORT** answers to these to anchor your talk

- Background definitions and examples
- Research context
- Your research question and why it is important
- Your setup, key finding(s), and what they contribute
- Examples or other explanations of your findings
- Future directions / open questions
- Acknowledgements/thanks to funding sources

Talk with your Mentor about these topics/questions!

Tips on Verbal & Nonverbal Communication

Goal: convey the main ideas

$\longrightarrow$ be clear

$\longrightarrow$ communicate with your audience

Oral Presentation:

- volume
- right pace
- conversational style (do not just read, but use scientific jargon $\rightarrow$ difficult $\rightarrow$ practice)
- vary intonation, stress, and pacing

Non-Verbal (Body):

- use a pointer stick (or arm)
- make eye contact
- facial expressions, gestures, posture, breathing
- dress code

Tips on Increasing Clarity

- Assume your audience has no knowledge of your research and define everything.
- Simplify as much as possible without sacrificing the key ideas
  - Use intuitive explanations, examples, figures, demos, etc. to highlight your definitions, set-up, and results
  - Avoid long derivations or proofs
  - Give the simplest "interesting" version of your results
- Keep your audience with you
  - Walk your audience through your data and graphs - identify the axes, nature of plots and point out interesting features
  - Repeat key definitions and points
  - Use transitions between slides to remind the audience of your talk's structure
- Practice, Practice, Practice (alone, for your friend, for your mentor, etc.) Get feedback.

Slide Logistics

Goal: convey main ideas, be clear, and communicate with your audience

- Use Google Slides or Powerpoint or Latex Beamer
- Formatting tips
  - Use large enough font
  - Use bolding, columns, blocks, lists, color, etc. to set apart/highlight key information
  - Avoid unnecessary whiz-bang special effects BUT educational simulations can be helpful (make sure to test ahead of time)
- Slides are your visual aid
  - Include key ideas, not every word you'll say
  - Address everything on your slide
  - Use Page Numbers
- Timing for slides? Varies between disciplines and styles
  - varies: 1 min per slide (can build up bigger slide)

Suggested Outline

Goal: convey main ideas, be clear, and communicate with your audience

Talk with your advisor!

- Title (extremely short time)
- Acknowledgements
- Outline (for long talks only)
- Background/Motivation
- Your Contributions
- Summary (to stimulate questions)

Hosting (or Chairing) a Talk

The Host:

- ensures room is available, projector & computer are working, etc.
- introduces speaker
- leads Q & A
- if no questions, host asks question
- as chair: keeps track of time

These Slides & Further Info

For these slides, and further info (including latex beamer) see

`http://www.eg.bucknell.edu/~kvollmay/summerresearch/`

For the sign-up sheet for the talks (presenter & host) see your email.