Giving effective research presentations

Jane Moodie
Graduate Research Student Academic Support
Engineering Faculty
What do you want to do in your presentations?

• to communicate your exciting research findings
• to get others interested in your work
• to interest and entertain your audience
• to establish yourself as a good presenter
What are you most worried about?

- nerves?
- difficult questions?
- technical disasters?
- going overtime?
- forgetting what you wanted to say?
In today’s seminar we will examine

The best way

• to get your content right
• to use good slides
• to deliver confidently
• to deal with questions
What’s in it for you?

Giving presentations

• is a practical skill – you get better with practice!
• makes you assess your progress
• enables you to get feedback from others
• brings your work to the attention of important people
Key features of good presentations
Avoid this!!

What makes a research presentation fail?

2 minute exercise in pairs or threes

List 3 - 4 key things to avoid
Other students have said

1. Wrong content
   - pitched at the wrong level – *too technical, too detailed, too difficult*
   - too much information – *confusing, too many messages, couldn’t keep it all in my head!*
   - no clear structure – *disorganised, difficult to follow, got lost*

2. Terrible slides – *too many slides, too crowded, too much reading, font too small*

3. Poor delivery style – *too fast, no eye contact, monotonous voice*
Getting the content clear
Different types of research presentations

1. informal research group presentations
2. departmental confirmation and progress reports
3. conference presentations
4. presentations to industry partners
Fundamental elements in any presentation

1. Abstract – Overview and key findings
2. Research motivation – *Why are you doing your work? What is the research problem?*
3. Research aims – *What are your research aims?*
4. Methodology – *How are you doing your research?*
5. Key results so far – *What have you found? What do these results mean?*
6. Main outcomes/conclusions – *What do you now know/have?*
7. Next steps in your research – *What will you do in the future?*

Different elements are important in different presentations.
Planning the presentation content

Start with two questions:

1. *Who is the audience? What do they want from you?*

2. *What is your main purpose? What do you want the audience to take from the talk?*

Use your answers to carefully select relevant content that will help you achieve your purpose.
For a typical departmental seminar

Departmental seminar = progress report

Audience = some experts in your field, some experts in the general area and others who know little

Purpose = to demonstrate your progress-to-date and to propose next steps

Provide a broad overview of your project, focusing on achievements since your last seminar. Outline the next part of your work.
For a typical conference presentation

Conference presentation = some key results

**Audience** = usually experts in the field

**Purpose** = to get them interested in your work and to read your written paper

Focus narrowly on one part of your work highlighting the valuable outcomes of this work
Using a clear logical structure

1. Use the familiar structure: Introduction - Body – Conclusion

2. Repeat information to help your audience understand: Tell them what you’re going to tell them; Tell them; Tell them what you’ve told them

3. Provide lots of signposts signalling the steps in your presentation and your argument - Let's now consider another crucial factor... I'd now like to move on to the next significant question...
Introduction: get your audience interested

1. First, outline a fascinating research problem and give key exciting new results, the Abstract - *Grab their attention! Hook them!*

2. Next, give them your clear purpose – *Today I want to* ...........................................

3. Finally, give them a clear simple outline of the presentation – *First I’ll outline ... Then I’ll cover ... Finally I’ll show ...*
Introduction: make your audience feel confident in you as a presenter

1. Learn the words of your Introduction off by heart so you can concentrate on making eye-contact

2. Make them feel they are in good hands with a clear picture of the presentation ahead
Watch example 1: Introduction to the TED talk:

*Self-healing concrete and asphalt*

https://www.youtube.com/watch?v=0l_9NDZ8VZA

Professor Erik Schlangen, Professor of Experimental Micromechanics and Director of the Microlab at Delft University of Technology, Faculty of Civil Engineering and Geosciences, Holland
Watch example 2: Introduction to Mech Eng conference presentation

*Nonlinear Instabilities and Koopman Modes in Axisymmetric Multiphase Shear Flows*

https://www.youtube.com/watch?v=ngXwBsM9GRU&feature=youtu.be&t=59s
Body of the presentation: keep your audience interested!

• Use a simple structure with 3 - 4 parts - easy to remember and see your clear messages

• Keep giving the audience a clear roadmap to link the parts - I’ve covered the main techniques... So now let's look at the results.... I'd now like to move on to the next ... In summary .......

• Keep the sections balanced in length – not too much background/ literature review – focus on important results and new insights
Conclusion: leave them with a strong message!

Don’t fade away - Oh well I’ve run out of time ......

1. Review your purpose - So, today I wanted to show you.....

2. Summarise main outcomes of the work

3. Give them a clear take home message – If there’s one thing I’d like you to remember today, it’s ........
Getting the content clear in a conference presentation
Some challenges of conference presentations

1. Getting your paper accepted

2. Coping with strict time constraints - 15 minute presentation = 12 for talk + 3 for questions

3. Focusing on only 1 -2 key points – state your central message in 25 words or less and use this to plan your talk

4. Explaining why your key results are significant- answer So what? and What is your contribution?
Content of a typical conference presentation


- Hill’s outline of the content and the recommended number of slides is a starting point, not a rigid template.

- Hill says that “Most good speakers average two minutes per slide (not counting title and outline slides), and thus use about a dozen slides for a twenty minute presentation.”
Example 1: Mech Eng conference presentation

*Branching Behaviour During Vortex-Induced Vibration at Low Reynolds Numbers*

- The central message of this presentation is that *the branching behaviour that is very obvious at high Reynolds numbers also occurs at low Reynolds numbers*

- This message is repeated in the presentation title, in the results slides, and it is highlighted in the Discussion and Conclusion
Example 1: Structure of this presentation

<table>
<thead>
<tr>
<th>Section</th>
<th>Slides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>1 slide</td>
</tr>
<tr>
<td>Outline</td>
<td>1 slide</td>
</tr>
<tr>
<td>Problem setup</td>
<td>2 slides</td>
</tr>
<tr>
<td>Background</td>
<td>2 slides</td>
</tr>
<tr>
<td>Brief method</td>
<td>1 slide</td>
</tr>
<tr>
<td>Results</td>
<td>8 slides</td>
</tr>
<tr>
<td>Conclusions</td>
<td>1 slide</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16 slides</td>
</tr>
</tbody>
</table>
Example 2: Mech Eng conference presentation

Nonlinear Instabilities and Koopman Modes in Axisymmetric Multiphase Shear Flows

https://www.youtube.com/watch?v=ngXwBsM9GRU&feature=youtu.be&t=59s

Total number of slides used = 14 slides

Exercise: Watch this presentation and answer these questions:

1. What is the central message of this presentation?
2. What is the structure of this presentation?
Designing good slides
Key features of effective slides

Slides communicate visually with

• not many words
• clear simple images and graphs
• good colour scheme
• only one key message per slide
Make your message **visual**

The visual communication should reinforce what you are saying in the spoken communication
Tips for using your slides

• Allow at least 1 - 2 minutes per slide
• Always know what you want to say as you transition from one slide to the next
• Do not read aloud the words on your slide - use your slides as a prompt for what you say
• Don’t turn towards the screen – look at the audience
• For a slide with a graph, always clearly state what is shown on the axes and highlight the key finding shown
Tips for choosing your slide template

Your template should be

• attractive and simple
• easy to read
• visually consistent throughout
Conventional Battery Systems

- **Lead-Acid** – Rechargeable, heavy and toxic (but cheap!)
- **Nickel Cadmium** – Rechargeable, toxic
- **Nickel Metal Hydride** – Expensive rare earths
- **Lithium based** – Expensive, safety concerns, low weight
- **Zinc Alkaline** – Limited power output, non-rechargeable, cheap
<table>
<thead>
<tr>
<th>Overview</th>
<th>Problem</th>
<th>Background</th>
<th>Method</th>
<th>Results</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Explanation of problem setup</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Background</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Brief method</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Results and comparison with experiments</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Conclusions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Making your delivery effective
What makes a good delivery style?

• Aim for a relaxed conversational style

• Use more informal spoken language (we examined .... Our results are exciting ...) not formal academic written language

• Focus on keeping the audience engaged and getting your message across

• Smile and make eye contact!
Make your voice work for you

• Speak clearly and distinctly
• Sound enthusiastic
• Vary your intonation and pace
• Don’t speak too quickly
• Use pauses to help you communicate -
  to add emphasis after an important new point,
  to give audience some time when you show a
  new slide
Make your body language work for you

• Make plenty of eye contact – you look shifty and dishonest if you don’t meet their eyes!

• Use natural gestures- add some emphasis

• Use some movement but careful of too much – don’t freeze but don’t overdo it

• Relax your posture
What about nerves??

- Prepare well and rehearse many times
- Script what you’ll say where important
- Be familiar with the venue and the equipment
- Remember the audience wants to hear what you have to say
- Rehearse, rehearse, rehearse!!
Dealing with questions
Dealing with questions

Take control of question time

1. Anticipate questions and prepare answers
2. Repeat questions back to the audience – if necessary, rephrase for clarity
3. Clarify complicated multi-part questions
4. Be honest when you don’t know the answer – say you don’t have the answer, but then amplify with reasons: not part of your topic, outside your area of expertise, topic not covered yet, I’ll have to look into that!
5. Offer to discuss difficult questions afterwards – That’s a very interesting complex question. Let’s talk about this later.
Finally, always try to improve next time!

Evaluate your own presentations:

**Content:** Did I get my message across? Was my presentation structure simple and clear?

**Delivery:** Was I relaxed and confident?

**Slides:** Were the visual messages loud and clear?

**Questions:** Did I answer effectively?

What would you change next time?
Some final advice

• Try to find great online engineering presentations – analyse and use them as models – eg TED talks

• Identify good strategies used by other speakers and adopt them as your own
In summary

Today we’ve looked at ways of achieving successful research presentations

Use our discussion to devise a well-structured, well-rehearsed presentations using excellent verbal and visual communication
References

For advice on giving presentations:

1. Poster and Presentation Resources, Graduate School, University of North Carolina
   http://gradschool.unc.edu/student/postertips.html#prez

2. Hill, M April 1992; Revised January 1997, Computer Sciences Department, University of Wisconsin-Madison
   http://pages.cs.wisc.edu/~markhill/conference-talk.html#outline

For advice on devising good slides:

1. Scientific Presentations: The Assertion-Evidence Approach, Michael Alley, Penn State University
   Guidelines for Engineering and Science Students online resource at:
   http://writing.engr.psu.edu/assertion_evidence.html

2. Using PowerPoint in Oral Presentations, The Learning Centre, University of NSW at:
   https://student.unsw.edu.au/support-oral-presentations

Excellent online resource:

Matt Carter, 2012, Designing Science Presentations: a visual guide to figures, papers, slides, posters, and more, ebook available Monash University Library