Presenting Technical Results

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Engaged Learning Workshop – 1/21/14
The goals

- Communicate your work
- Establish audience interest
- Convey what new you have seen
- Deliver new information
- Defend your results or conclusions
- Connect your work to that of others
Some challenges

- Need to acknowledge other viewpoints
- In scientific context:
  - Conveying objectivity vs. sustaining interest
- Need to present a lot of information
  - *How you did it* possibly more important than *what you determined*
- Implicit creativity hard to make evident
Core principles

What is the purpose?

What are key ideas?

How best to present those ideas?

How do they relate to each other?
What is the purpose?

- Usually, not just a placeholder
  - Demonstrate your understanding of material
  - Explain it to others
  - Propose some ideas/project/vantage
  - Convince your listeners, bring them to understand
- **Always keep this in mind:** design your discussion so this is integral to what you write
How best to present?

- What is the role of different techniques
  - Visual aides (transitions, animations...)
  - Plots are key:
    - What do they mean? Describe them
    - Make concepts graphical
  - Textual discussion important: Don't use paragraphs!!!
  - If mathematical expressions: how do you get information about them across
- Consider arrangement of the information
What are key ideas?

- Break topics down
  - Need to identify concepts, parameters ahead of time
  - What are these items for a given topic?
- How do ideas relate to one another?
  - Order and arrangement of material is critical
  - Research often not a linear sequence of items, ideas
    - Ensure concepts connect effectively to their dependent ideas
Clear Introduction

- Establish main or overarching point
  - Give a clear title

- Clear and concise

- Explain role of your work within this larger picture

- Eg. If studying Paleoindian sites for signs of social hierarchy
  - You could show a site

Ohio Moundbuilders, c. 1000 A.D.
External Analogy

- Particularly important for lay audience
- What is more effective?
  - Jupiter 90,000 mi diameter
  - Earth 8,000 mi.
- Or
Sparse text

- If Spend 1 year in a project
  - Cannot precisely present in 5 min.
  - No sentences; minimal text
- Minimal use of equations, symbols
  - Only what you need for your purpose
  - Explain them when you show them:
    - expressions have story associated with them: tell it
"...focus and simplicity. Simple can be harder than complex: you have to work hard to get your thinking clean to make it simple. But it's worth it in the end because once you get there, you can move mountains."

- Steve Jobs
Graphical information

- Tap into visual cortex!
- Provide important backdrop for discussion
  - You can point to some element
- Avoid common mistakes:
  - Always describe a graphical element
  - What are axes, colors, legend?
Theory and observation agree.

Theory errors \times 100!
Be well-organized!

- Important technical discussion
  - Even for lay audience
  - Still need to convince, explain
- Establish critical broad sub-elements
- Use visual cues to guide audience
  - Color, indentation
  - Built-in redundancies can help
Arrangement/flow

- Within a discussion element
  - what is relation of details among each other
  - Help audience digest by structuring
- Graphical arrangement
  - Example: how discuss the uncertainty principle?

```
Uncertainty Principle
ΔpΔx ≥ ℏ/2

Blackbody spectrum
E = ℏν

Wave packets
ΔkΔx = 1/2

de Broglie waves
p = ℏk
```
Detail required

- helps lead audience through it
  - your work being evaluated
- Too abstract: audience can't follow
- Problem in science
  - How navigate to presenting coherently, but concisely
  - And not be misunderstood

376 ft tall
76 ft circum. @ base
Your discovery!

- How make interesting?
  - Research should not be boring
  - How hook your audience?
- What is your voice?
  - Physical presence can be important: Pointing, movement
  - Should not take center stage, but
    - Does provide the impetus of your communication
    - Allows you to convey your ideas
- Don't forget your punch-line!
Good process

- Establish main purpose and point
- How much time:
  - Eg. What can you accomplish in 5-7 slides?
  - how many sub-points
- Draft an outline:
  - # main points ~ # minutes for presentation
- Try out a draft on somebody to tune things up (EL Symp. Dry run Feb. 5th)