Talking Points

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Talking Points Outline

- Preface
  - "Science not communicated is essentially science not done."
- The Audience
- The Presentation
- Visual Aids
- Delivery

Resources

  - Good information, current technologies
  - Very readable guide on the perils a beginning academic may face, and has some very good suggestions for ways to cope with them.
  - A bit older, but the content remains germane.
- European Federation of Catalytic Societies
Why Are Presentations Part of the SURF Program?

- Present for the experience of communication
  - Educating your colleagues or public
  - Enhancing your own personal development and recognition
  - Raising money to carry on your work
- Share their research experiences, approaches, and results
- Discover what you know and what you don’t understand yet

The Oral Presentation

The Assignment

- 12 min presentation and 3 min for Q and A
- Audience of peers, mentors, faculty, staff, and possibly parents

The Standard

- Presentation must be of professionally quality – an excellent representation of you, your advisor, your work, and the SURF program!

Speaking in Science

An oral scientific presentation should:

- Present the facts in an unbiased manner
- Be clear: concise and complete
- Reinforce the talk with visual aids (slides)
- Repeat talking points

An oral scientific presentation should not:

- Be haphazard, jumbled and illogical
  - Audience cannot return to any information!
- Provide too much information in rate and volume
- Distract the audience from the message
The Audience:
The attention curve

- Why is the audience there?
- How does the audience listen?

The Audience:
Managing the Attention (1 of 2)

- Everyone listens in the beginning, *carpe diem*
- State message in the beginning
- Repeat the message at the end
- Divide talk into parts with intermediate conclusions
  - Direct or re-direct (if lost) the audience
  - Repeat key points

The Audience:
Managing the Attention (2 of 2)
The Audience: 
Distractions (1 of 2)
- Failure to establish the background
  - Information to appreciate the work is usually not common knowledge
- Poor organization of the talk
  - Lack of clarity for problem identification, aims, or motivation for the work
- Inadequate visual aids (slides)
  - Confusing, unreadable, too small, too crowded, etc.

The Audience: 
Distractions (2 of 2)
- Complex oral speech
  - Long sentences, unnecessary jargon, abbreviations, etc.
  - Passive sentences
    - "From this figure it was deduced that..." or "It was therefore concluded..." versus active voice ("This figure implies that..." or "Therefore, we conclude...")
- Reading a written speech
  - Formal and complex language
  - Pace (and information density) high
- Speaking style
  - Monotonous sentences, speaking too fast or slow, unclear pronunciation, lack of emphasis, etc.

The Presentation: 
Organization
- Group together what belongs together
The Presentation:

Key issues

- The message
  - What should the audience know at the end of the presentation?

- The audience
  - How should the presentation be delivered to convey the message for the audience?

The Presentation:

Messaging

- Summarize into ONE sentence
- Serves to focus the presenter and consequently the presentation
- Example:
  I want to convince the audience that metabolites of the anticoagulant drug warfarin (Coumadin) inhibit their own formation and consequently could impact adequate dosing for patients.

The Presentation:

Introduction (1 of 2)

- Time zero
  - Rapt attention from the audience
  - Set the tone to maintain the attention

- Address the audience and pause
  - Confirm the attention of the audience
  - Test the audio system

- The opening
  - Pose a question, provocative statement, your conclusion
The Presentation: Introduction (2 of 2)

- Sketch background for the project
  - Introduce the topic
  - Explain terms, concepts, and theories
  - Establish context for discussion of research
  - Include only relevant information
- Define the scientific question or hypothesis
- Help audience anticipate experimental outcomes
  - Possibly include the conclusion

The Presentation: Results

- Employ the message sentence to select appropriate results
- Order the results for the presentation
  - Is chronology important?
  - What are the intermediate conclusions?
- Include enough experimental details to provide context for results
  - Note, audience is not your mentor

The Presentation: Conclusions

- The take home message
  - Answer questions raised in the introduction
  - Validate/refute the hypothesis
  - Emphasize impact of resolving the challenge
  - Cite future directions resulting from the study
- Acknowledgements
  - Include summary statement on last slide — repetition!
  - Mentors, Colleagues, institutions and organizations
  - Granting agency
  - Sometimes placed at the beginning
Visual Aids: General

- Consider 1-2 min per slide
- Complement speaker not supplant
- Affect evaluation of presenter and studies
- Capture right information
  - Lead logically from one point to next, interpreting, and clarifying points
  - Make an outline for starters
- Provide structure not text for speech
- Resources (actual slides, presentation, etc.)
  - Advisor, lab members, ...

Visual Aids: Design concepts

- Make it **BIG**
- Keep it **Simple**
- Make it **Clear**
- Be **Consistent**

Visual Aids: Design specifics (1 of 2)

- Components
  - Title – informative or conclusive
  - Figure/Data
  - Conclusion(s) at the bottom
- Font: Tahoma, Helvetica, or Arial **not** Times
- If color slides, ...
  - Shadow the text
  - Employ contrasting colors
Visual Aids: Design specifics (2 of 2)

- Repetition of format
- Left-to-right, top-down bias
- Size: Readability – BIGGER is better
- Employ minimal flashing visuals
- Use simple, labeled visuals

Visual Aids: Presenting data

Delivery: Guidelines (1 of 3)

- Focus on the audience and their needs
- Place weight on balls of feet to stand straight
- Gesture with hands in front & towards audience
- Respond to ideas – facially and bodily
- Look at people to see the understanding
- Embrace the entire space of the room
- Walk toward the audience on important points and avoid backing-away on any key ideas
Delivery: Guidelines (2 of 3)

- Use voice to respond to material employing volume and pitch to support content of speech
  - Speak louder than normal conversation and project enthusiasm
- Enhance the talk and stimulate the audience through the speaking pace
  - Slow down for new/difficult material and emphasis
  - Speed up when reviewing
- Always repeat questions
  - Clarify the question
  - Ensure rest of the audience heard the question
  - Provide time for you to compose the appropriate response

Delivery: Guidelines (3 of 3)

- Practice
- Practice
- Practice

Writing Points

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Hungry?

“If you have an apple, I have an apple, and if we exchange these apples then you and I will still have one apple. However, if you have an idea, I have an idea, and we exchange these ideas, then each of us will have two ideas.”
- George Bernard Shaw

Writing in Science

- Present the facts in an unbiased manner
- Be clear: concise and complete
- Use facts to make statements
- Be complete enough that other scientists can repeat your work (research papers)

“Everything should be made as simple as possible, but not simpler.” – Albert Einstein

Anatomy of a Research Paper

- Title
- Abstract
- Introduction
- Materials and Methods
- Results
- Discussion (start here?)
- Conclusions
- Acknowledgements
- References
- Supplemental Material
Getting started

- Format for PC in Microsoft Word
  - Submit using a PC format on a USB or via email
  - Set-up: 8.5 x 11 with 1 in margins all around
- INBRE Format:
  - Text: Times New Roman 12 point font, left justified, indent first line of paragraphs 0.5 inch, single spaced.
  - Section Titles: Times New Roman 14, Centered, Bold
  - Do NOT number pages

Title

- Function
  - Orientate the audience
  - Brief, concise description of purpose and major findings
- INBRE Format: Title
  - NVR, U. ABBRVS. In a TTL. Like OMG, WTF, BBQ.
  - Include technique or method (Research Paper)
  - Times New Roman 14, Centered, Bold
- INBRE Format: Author name and affiliation
  - Author only; acknowledge others in Acknowledgements
  - Name, Student University
  - University town and state
  - Times New Roman 10, Centered, Bold

The Production of Cytochrome f by XYZ Mutants
John Doe, University of New Mexico
Las Cruces, New Mexico

Abstract

- Short summary (usually 250 words)
  - Provide concise statement of purpose
  - Succinctly and clearly describe major findings
    - Highlights, no details
  - Understandable in itself
  - No undefined abbreviations or specialized terms
  - Typically written last
- INBRE: Abstract
  - Times New Roman 12, Center justified, Bold
Introduction

- Brevity
  - Start with broad focus and then end narrowly
  - Not an extensive review of the literature
  - Relationship to earlier work in the field
  - State relevance of topic – the context
  - Give the purpose of the paper

Parts of the Introduction

- Background
  - Introduce the topic
  - Familiarize audience with terms, concepts, and theories
  - Establish context for discussion of research
  - Include only relevant information
- Current Research
  - Focus on specific studies related to reported research
  - Frame the challenge in the paper
- Proposed work
  - State the purpose of the study
  - Is there a hypothesis to be tested?
  - Discuss the strategy of the study

Materials and Methods

- Like a recipe
- Cite source of all materials
  - How would these materials be obtained to reproduce the experiments?
- Use sub-titles to organize the material
- Include only experimental details
- Reference all established approaches
  - Typical methods built upon prior work
Results
- Use sub-titles to organize the material
  - Include summary finding
- Employ introductory sentences to keep the audience focused
  - Why was this particular experiment included?
- Present material in a logical fashion often mirroring the methods
- State the facts and that’s all
- Be descriptive of results emphasized in the Discussion to guide the audience

Discussion
- Focus on objective of the study as stated in the Introduction
  - What was the challenge?
  - Was the challenge met? What resulted?
  - What is the significance of that result?
- Break up into sections to emphasize key observations and simplify the writing
- Refer to results not restate them
- Facts support conclusions not “fancy talk”
- Anticipate and respond to potential questions

Conclusions
- Summarize the most important finding
- Emphasize impact of resolving the challenge
- Cite future directions resulting from the study
- Return to breadth of impact but avoid over-speculation
References

- There are three major, journal-specific styles
  - Name and year
  - References at end of sentence in parentheses (Einstein, 1955)
  - Indexed alphabetically, using years as secondary
- Italic number in line
  - Number in parentheses or brackets at end of sentence ([34] or [34])
  - Indexed in the order of appearance
- Superscript numbers
  - Numbers at the end of a line after the period.¹⁴
  - Indexed in the order of appearance
- INBRE: References
  - Times New Roman, size 12 font
  - "Reference and Citation Guidelines in Word"
  - ACS Citation Style Guide

Acknowledgements

- NO friends and family – you didn’t win an Oscar
- Proofreaders
- Mentors
- Colleagues who helped with training, reagents, etc.
- Institutions and organizations
- Granting agency
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Figures

- A picture is worth a thousand words
- Clarity is important!
  - Carefully choose image size, font size, line widths, and labels
- Plot theory and experiment on same graph
- Explanatory captions necessary
- INBRE: Tables, figures and graphics
  - Fit within 1 in margins
  - Format to fit in portrait, not landscape layout
  - Be reproducible in black and white
**Supplemental Material**

- Additional results that support the study
- More common in the information age
- Ease in data generation leaving the challenge to its interpretation
- Examples
  - Raw data
  - Quality control studies
  - Repetition of the same or similar studies

**Writing Style**

- **Employ**
  - Short sentences (complexity = confusion)
  - Primarily* passive voice
  - Primarily* past tense
  - Consistent tense
  - Gender neutral terms

- **Avoid**
  - Ambiguity through precise language
  - Vernacular (often employs contextual terms)
  - First person singular/plural wherever possible

**Other Thoughts**

- Talk “to” not “at” the audience
- Reminder – all research papers are reviewed
- Avoid blather (BS)
- Do not plagiarize, e.g. parts of sentences or complete sentences directly from papers
- Proofread!
  - Content, grammar, spelling, format
  - Capitalization
  - Read a sentence and confirm the intention is clear
  - Spell check! For example, from (form), there (their), etc.
- Get a second, third, ... opinion on the writing
Plagiarism

- Intentionally or knowingly presenting the work of another as one’s own (i.e., without proper acknowledgment of the source). The sole exception to the requirement of acknowledging sources is when the ideas, information, etc. are common knowledge.*

*http://www.unf.edu/registrar/forms/misconduct_policy.pdf

Resources

- ACS Style Guide – Janet Dodd (2nd or 3rd edition)
  http://pubs.acs.org/page/books/styleguide/index.html
- How to Write and Publish a Scientific Paper by Robert A. Day
  http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWgeneral.html
- On being a scientist: responsible conduct in research
  Committee on Science, Engineering, and Public Policy
  http://books.nap.edu/openbook.php?isbn=0309051967
- On Writing Well: An Informal Guide To Writing Nonfiction by William Zinsser
- Style: Toward Clarity And Grace by Joseph M. Williams
- Writing Guidelines for Engineering and Science Students
  http://www.writing.engr.psu.edu/
- The Craft of Scientific Writing by Michael Alley
- Lecture by Michael Lufaso, Ph.D. at University of North Florida