

Terminology-Focused Front-End Evaluation in Climate Science Communication

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Evaluation Goal—Assessing Change

- We evaluate changes in knowledge/attitudes
 - Pre/post surveys, interviews

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- We evaluate changes in knowledge/attitudes
 - Pre/post surveys, interviews
- However, communication about key concepts can be tricky due to terminology.

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Understanding the Pre-Communication Condition

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- We may want to assess the audiences' understanding of terms or phrases.
- Sometimes, they don't know the terms and will learn the scientific meanings during the communication.
- Other times, terms may already have established meanings for the audience—different from the meanings used by scientists.
- This situation can lead to the audience misinterpreting the communication.

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Addressing Potential Confusion

- Identify key words and phrases
 - What is their meaning for scientists?
 - What is their meaning for the audience?

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 - What is their meaning for scientists?
 - What is their meaning for the audience?
- Starting point—Sommerville & Hassol's list
 - Somerville, R., & Hassol, S., (2011) Physics Today 64(10), 48 (<http://dx.doi.org/10.1063/PT.3.1296>)

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Step 1—Identify Terms of Confusion

Terms that have different meanings for scientists and the public		
Scientific term	Public meaning	Better choice
enhance	improve	intensify, increase
aerosol	spray can	tiny atmospheric particle
positive trend	good trend	upward trend
positive feedback	good response, praise	vicious cycle, self-reinforcing cycle
theory	hunch, speculation	scientific understanding
uncertainty	ignorance	range
error	mistake, wrong, incorrect	difference from exact true number
bias	distortion, political motive	offset from an observation
sign	indication, astrological sign	plus or minus sign
values	ethics, monetary value	numbers, quantity
manipulation	illicit tampering	scientific data processing
scheme	devious plot	systematic plan
anomaly	abnormal occurrence	change from long-term average

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Step 1—Identify Terms of Confusion

- “Theory” is a term commonly used.

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Step 2—Identify the Expert Meaning

- “Theory”—Science Meaning
 - An explanation of some aspect of the natural world that has been validated through repeated testing

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Step 3—Identify the Common Public Meaning

- “Theory”—Public Meaning
 - A hunch or speculation
 - “It’s just a theory.”

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Step 4—Identify a Possible Alternative

- “Theory”—Possible alternative
 - Scientific understanding

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Use Front-End Evaluation

- Identify key words and phrases

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Use Front-End Evaluation

- Identify key words and phrases
- Ask the incoming audience (survey, show of hands, clickers) what the terms mean
 - Provide a “bridge” to the science meaning
 - Use alternate terms in the communication

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Use Front-End Evaluation

- Identify key words and phrases
- Ask the incoming audience (survey, show of hands, clickers) what the terms mean
 - Provide a bridge to the science meaning
 - Use alternate terms in the communication
 - Specify the scientific context for the terms

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Example—Madison Area Technical College

- Climate and Climate Change Course for non-science majors
- Course goals:
 - Promote a basic understanding of the complexity of climate on Earth
 - Communicate specifics on climate change to students

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Example—Madison Area Technical College

- **Anonymous registration survey**
 - Multiple-choice
 - Included questions for the Sommerville words

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Example—Madison Area Technical College

- Front-end survey data informed instructors so they could customize each semester's material
- Pre/post data showed changes in student understanding

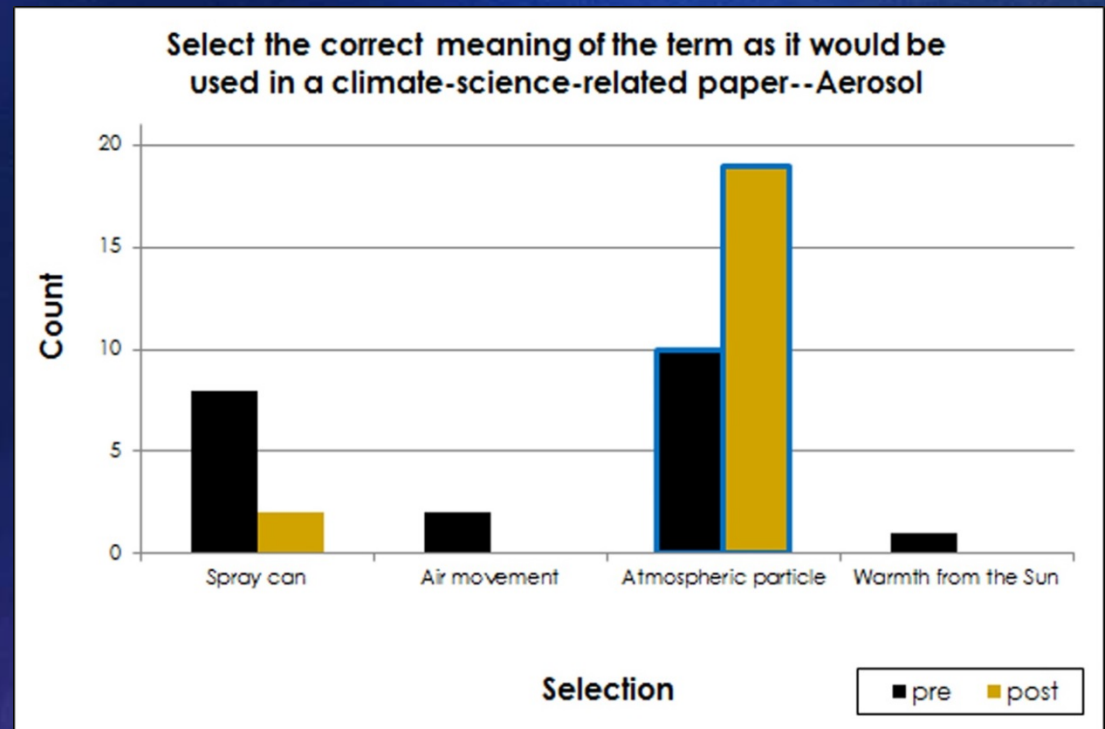
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Example—Madison Area Technical College

Select the correct meaning of the term as it would be used in a climate-science-related paper.

Aerosol

- ☐ Spray can
- ☐ Air movement
- ☐ Atmospheric particle
- ☐ Warmth from the Sun



Handout Activity and Discussion

- Consider a project you have evaluated.
- Using the handout, list a few words that might have different meanings for the experts and the audience.
- Suggest alternative words or phrases.

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