Life is excessively limited in length.

Life is excessively Limited in length.

Life is too short.

Richard A. Lanham

Outline
- Common attributes
- Types of technical written communication
- Oral Communications Basics

TECHNICAL COMMUNICATION WRITING

ME 481 Senior Design
Fall 2017

Dr. A Zachary Trimble
Technical Communication Attributes

Communicate

Succeed in conveying one's ideas or in evoking understanding in others.¹

– Reader/listener giving you their most important resource: time²
  • Your reader only owes you one reading
    – Be clear
    – Be concise
    – Provide logical structure

– No mystery novels
  • Describe the whole before the part

– Reasons to communicate: persuade, inform, …
  • Convince not coerce

---

¹ https://www.google.com/search?q=communicate+definition&oq=communicate&aqs=chrome.1.69i57j0j0i67i65.3547j0j7&sourceid=chrome&ie=UTF-8
Expert Communicators...

“... assume that their chief job is to communicate. They hope to do more, of course—namely, persuade and charm—but they know that communication must come first, especially if they are ever to achieve these other effects.”

assume, with a pessimism born of experience, that whatever isn’t plainly stated, the reader will invariably misconstrue.

assume that even their profoundest ideas are capable of being expressed clearly. They aren’t so vain as to think that their reflections transcend the powers of language

have accepted the grim reality that nine-tenths of all writing is rewriting.

are, perhaps most important of all, a stickler for continuity

POWER

- P – Plan the writing
- O – Outline the Report
- W – Write
- E – Edit
- R – Rewrite

Think visually.

Whitesides’ Group: Writing a Paper

By George M. Whitesides

1. What is a Scientific Paper?

A paper is an organized description of results, conclusions, intended to instruct the reader. Much of the data goes into the text; most of the thoughts go into the analysis. It is efficient in time to go through several (even many) versions of the full text of a paper before beginning to write text; rewriting many versions of the full text of a paper is slow.

Think visually.

Slocum

People who think in terms of pictures will not sketch a lot. People who think analytically in terms of equations will not think visually a lot. People who think in words should be writing vivid stories to describe their ultimate design contest. In fact, all people should do all three! In fact, writing not just your thoughts, but also lists of possible
Write ethically!

- Concise and accurate account of the work with an objective discussion of its significance
- Sufficient detail and references/resources to repeat the work or otherwise verify its accuracy
- Full, proper citations of all references, sources of information, and/or sources of inspiration.
- Not plagiarize or falsify
- Not reproduce data or graphics without proper copy write holder approval
  - An Example: Fair Use
    [http://libguides.mit.edu/usingimages](http://libguides.mit.edu/usingimages)
Write precisely and clearly

• Richard Feynman
  – “The first principle is that you must not fool yourself and you are the easiest person to fool.”
  – “…boil down incredibly complex concepts and put them in simple language that other people can understand.” Only when Feynman could do that did he know he truly understood a concept himself

The relationship between the nature of salt water to fresh water in the Edgartown Great Pond that fluctuates often is extremely important to everyone including scientists, residents, and environmentalists on Martha’s Vineyard.
The relationship between the nature of salt water to fresh water in the Edgartown Great Pond that fluctuates often is extremely important to everyone including scientists, residents, and environmentalists on Martha’s Vineyard.

The fluctuating salinity of EGP concerns many environmentalists, scientists, and residents.
Solution of the full three-dimensional equation set is too cumbersome for hand calculations. Furthermore, classical free-body diagrams cannot easily account for factors such as friction in each of the joints, elasticity in the joints and binding – all of which may change as a function of wear. Simplifications can be made to the free-body diagram set to reduce the problem to a series of planar systems, however solving these simplified equations does not yield a solution that accounts for the magnitude of the problem. For these reasons it is recommended that rigid-body FEA analysis of the system be performed. Such an analysis can accommodate all of the factors listed above, and can easily be modified to investigate a wide range of potential cases.
Write precisely and clearly: examples

Precision

-I only eat apples.
-I eat only apples.

Write precisely and clearly: examples

Precision
Key information in the main clause

Despite winning the game, the Rainbow Warriors made several errors in the first half.

http://web.mit.edu/me-ugoffice/communication/technical-writing.pdf
Write precisely and clearly: examples

Precision
Key information in the main clause

Despite winning the game, the Rainbow Warriors made several errors in the first half.

Despite making several errors in the first half, the Rainbow Warriors won the game.

http://web.mit.edu/me-ugoffice/communication/technical-writing.pdf
Write precisely and clearly: examples

Precision
Key information in the main clause

Despite winning the game, the Rainbow Warriors made several errors in the first half.

Despite making several errors in the first half, the Rainbow Warriors won the game.

The Rainbows Warriors won the game, despite making several errors in the first half.

http://web.mit.edu/me-ugoffice/communication/technical-writing.pdf
Write precisely and clearly: examples

Context

The average house in the area has a radon level of 0.4 picocuries per litre.

http://web.mit.edu/me-ugoffice/communication/technical-writing.pdf
Write precisely and clearly: examples

Context

The average house in the area has a radon level of 0.4 picocuries per litre.

The average house in the area has a radon level of 0.4 picocuries per litre, which is considered low by the EPA [Lafavore, 1987].

http://web.mit.edu/me-ugoffice/communication/technical-writing.pdf
Write precisely and clearly: examples

Context

The average house in the area has a radon level of 0.4 picocuries per litre.

The average house in the area has a radon level of 0.4 picocuries per litre, which is considered low by the EPA [Lafavore, 1987]. Levels between 20 and 200 picocuries per liter are considered high, and levels above 200 picocuries per liter are considered dangerous. For reference, the average radon level in outdoor air is about 0.2 picocuries per litre.

http://web.mit.edu/me-ugoffice/communication/technical-writing.pdf
First Person or Third Person?

• Chicago Manual of Style:
  – “When you need the first person, use it. It's not immodest to use it; it's superstitious not to.” Simon Crowley: “Every time you use the passive voice, a kitten is killed by God.”
  – Avoiding the first person used to be considered proper, but now it's considered very formal, if not old-fashioned. It's not a question of correctness, however; both styles are correct. If you feel strongly that the first person is out of place in your work, don't use it.
    —Chicago Style Q&A, December 2010
Types of written technical communication

• Design Notebooks
• Proposals
• Technical Reports
  – Design reviews
  – Journal/Conference papers
• Instruction Manuals
• Marketing Materials
  – Brochures
  – Websites
Presentations

• Visual Events but communication is still primary goal
• Context is particularly important
• Time
• Nervous?
• Evaluation
Communicate

“The fundamental purpose of scientific discourse is not the mere presentation of information and thought but rather its actual communication. It does not matter how pleased an author might be to have converted all the right data into sentences and paragraphs; it matters only whether a large majority of the reading audience accurately perceives what the author had in mind.”

--George Gopen and Judith Swan (MIT)

The Science of Scientific Writing