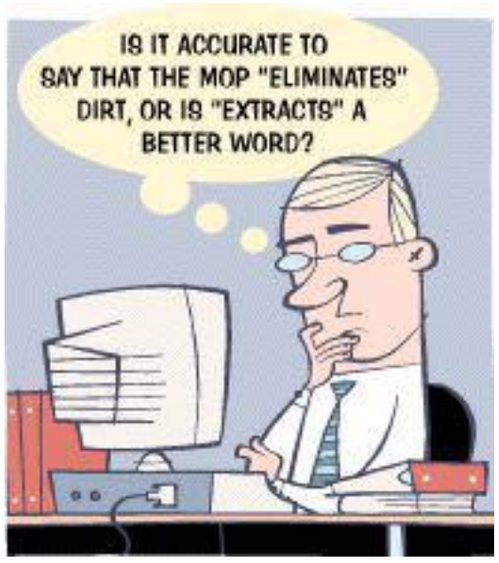
Technical Communication

Session 1

Introduction to the Principles of Effective Technical Writing



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Objectives

- The course will help you develop an awareness of
  - what academic writing is or what scientific writing is.
  - inform you of some core writing strategies that will enable you to prepare
  - address the importance of plagiarism along with importance of research ethics and scientific conduct
- let you know the principles of effective technical communication
  - ability to say something with clear logical progression of thoughts
  - cutting down on clutter
  - simplify obscure sentences to communicate with clarity of expression

Objectives

This course will help you engage with the techniques and strategies of effective technical

- in approaching to a topic, a text, or ideas through reading, evaluating, and analysing, and writing scientific papers,

- making the research pitch, organising sources, in the correct/required format, drafting abstracts, short reports, and reviews.

- present through properly designed posters/powerpoint presentations.

- critically engage with your own writing, make editorial changes, while making follow up drafts, and also objectively participate in peer-reviewing

- apply the strategies of effective communication to a. engaging in formal means of written communication including emails for specific official purposes

- conducting and documenting other formal write ups like making resume,
- drafting academic cover letters,
- and basics of research proposals,
- and statement of purpose for their research projects/ideas

Introduction

- Good writing
  - Communicates an idea clearly and effectively
  - The content has something to say
  - There is clear thinking and a logical progression of arguments
  - Needs to be well organised and structured
  - Time, patience, revisions, multiple drafts, and good editing - these are the requirements to write well

Introduction

- A good writer must have:
  - Clarity of ideas, should be aware what s/he wants to write
  - Must have some patience to keep working on it and perseverance to seek for good writing techniques
  - Open-mindedness to learning, and the capability to accept your mistakes and work on them → Feedback loop
  - Strict editing is a must and throwing away of the excess words/ repetitions etc → Consise edit
  - You need to learn steadily → fast af
    - its an acquired ability, a skill that can be learned through practice

Some basic principles

Rules of scientific writing that you should always keep in the back of your mind whenever you get down to writing your research paper.

Be clear, precise and focused as much as possible without sacrificing the meaning of your writing.

Keep your sentences and paragraphs reasonably short.

Remember less is more, avoid unnecessary jargon, use personal pronouns I and we for self-promotion in the international academic community.

Frame and contextualise whatever you are writing, and always let your reader know what you're writing about and why you're writing about this.

Define all your terms, the moment you first mentioned them. Simplicity is the heart of efficient scientific writing.

The secret of good writing is to strict every sentence to it's clearest component.

What is not to be done

- Avoid starting with lengthy generalisations, be specific
- The simpler the better, there is no need to be verbose or superfluous
- One idea per paragraph should be the ideal way
- Rephrase for brevity and being focused
- These are some of the things that you should avoid in writing:
  - Redundancies, modifiers, adverbs and adjectives, long words, sophisticated words
  - Words that have no meaning or little meaning, words that do not add any ideas to your content.

Clarity, Precision, and Accuracy

State your facts as simply as possible

the precision comes from selection not from compression.

There are different strategies how you can compress your paper, how you can make it condensed. Prune and shake is excellent advice.

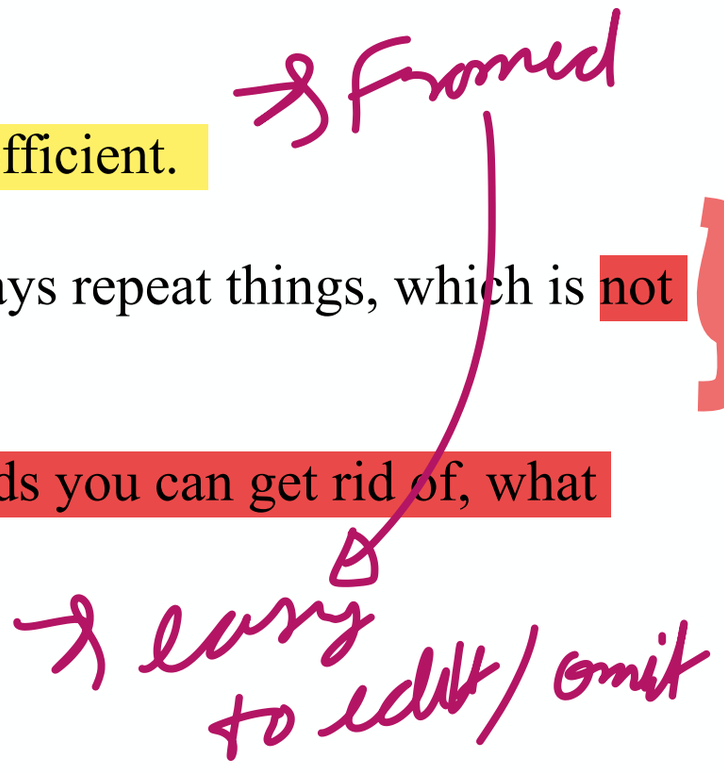
You have to decide what you do not need to say and then don't say it and that's the prune the big limbs part.

The next step is to decide what words you do not need in your paper, what ideas or concepts you do not need to present in your paper.

For this, you need to build up a good story frame. A broken frame is inefficient.

When you present your ideas in different places in your paper, you always repeat things, which is not very good thing in scientific writing.

When your paper is compact and condensed, then you decide what words you can get rid of, what words you can do without.



Avoiding Hedge

Hedge, or hedging mean taking both sides, thus taking no chances of absolute failure

words as I would like, I would suggest, I would try, modal verbs like could, might

So if you say this might mean, or these findings might mean this, this, or that, then you demonstrate,

you clearly demonstrate that you're only 50% sure of what you're writing

For example:

I would suggest this theory or this methodology from my research.

Why not just write I suggest, and

be more confident of what you're writing or for example

Hidden Negation

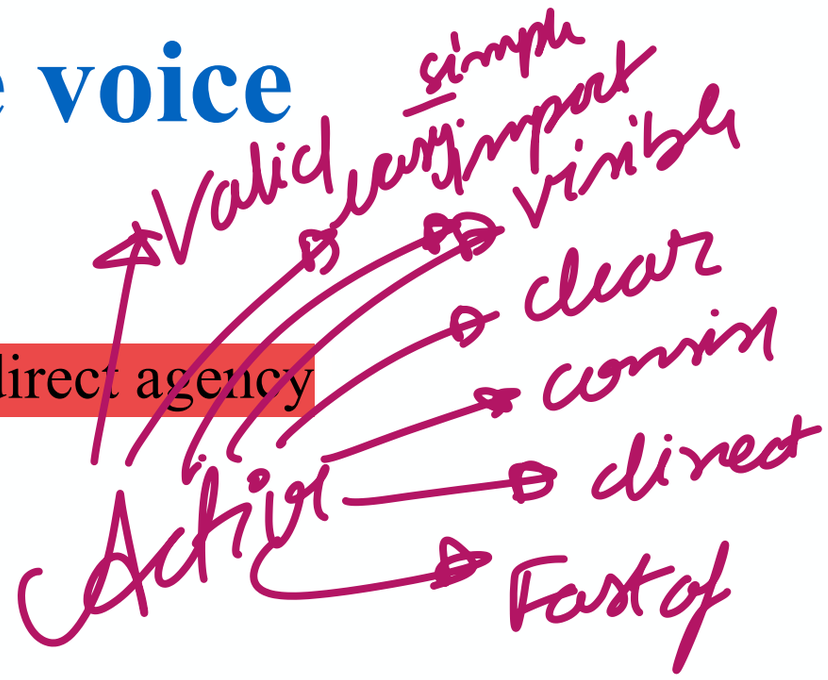
It is a style problem that creates wordiness, and bring twist and perplexity for readers, involves negation or negative phrasing

Negative statements do not always involve the fundamental negative words, not, no, never, or even there are similar negative word parts, such as un-, il-, ir-, dis- or -less

There are many other words with negative meaning, and some of them are not obviously negative at all

Avoid negative sentences as affirmative sentences are clearer, more condensed and precise

Active/Passive voice



- People often use the passive voice
  - it's indirect, polite, unaggressive, and lack of direct agency
- Active voice is clear, concise, and direct
- It is also visible and evocative
- You can see the doers of the action because they're named up front, and you can visualise the action because it is carried in a verb that follows immediately the subject
- The passive voice makes the reader work harder than necessary. Doing the harder work tires the reader
- Converting the passive voice to the active voice calls for the writer to put the true subject first

Active/Passive voice

Example 1

Active: Volatile organic compounds (VOCs) emitted from industries and vehicle exhausts can induce a series of environmental problems, including photochemical smog, broken ozonosphere, and environmental pollution.

Passive: A series of environmental problems, including photochemical smog, broken ozonosphere, and environmental pollution can be induced by volatile organic compounds (VOCs) emitted from industries and vehicle exhausts.

Example 2

Active: This study develops an efficient methodology to examine a space–time continuous dataset for urban irrigation water use.

Passive: An efficient methodology to examine a space–time continuous dataset for urban irrigation water use is developed in this study.

Tenses in scientific writing

Why are tenses important in science writing or are they important in science writing?

When you write a scientific paper you need to choose which tense or tenses to use.

Because depending on the field of your science,

- depending on the type of your research paper,
- so whether it is a technical report or review article,
- whether it is an original research paper or a review paper,
- then you will choose this or that tense

Tense that you use in your paper shows your reader very specific information

It is really crucial for an effective scientific writing.

In science writing, there are three basic tenses that are most often used.

present simple tense, the simple past tense, and the present perfect tense

Tenses in scientific writing

Results of Research

So let's consider the following example.

- The work demonstrated the use of XPS to characterise the chemistry of materials.

In this case the past simple tense is used and it demonstrates that the research was completed and you just state this past event.

So if you write the same sentence using the present perfect tense,

- The work has demonstrated a new use of XPS to characterise the chemistry of materials, you show that the research is still in progress.

Three tense forms, either active words or passive words make up the bulk of all verbal patterns forms in academic writing.

The present simple tense just 70%, the past simple tense 23% of all the tense forms. And the present perfect tense is about 5%.

70% 23% 5%

Tenses in scientific writing

Obvious facts General

The present simple tense is used in the introduction to report what we already know, and we report the topic of the research.

When you use the present simple tense in the conclusion, then you use it to transmit information that has become known and you say it is now known.

So we use the present simple tense in the conclusion to say that, now you know that this fact is relevant or this fact is important, this information is crucial.

In addition, the present simple tense is used in a research paper just to make a general statement, conclusion, or interpretation of previous studies or data refocusing on what is now known.

Besides, we use the present simple tense to express the consent with the other authors, with the other writers, with the other researchers.

We show our agreement with the previous studies.

Consent Recognize

- We recognise their achievements or some scientific truths

- The present simple tense is used to describe what the article is about and we demonstrate the consistency with overall results presented in the previous article

desc. article

Tenses in scientific writing

The past simple tense is used to write about a special study implemented by a well known scientist

It is also used to describe methods and data of the completed study

Verbs are used in the passive voice in the description of methods and processes

Verbs are used in the past simple tense in passive voice just to demonstrate the details of our experiment

and, to show that we did something while carrying out the experiment

Tenses in scientific writing

Results
Summery
Connections
Conclusion

So using the present perfect tense,

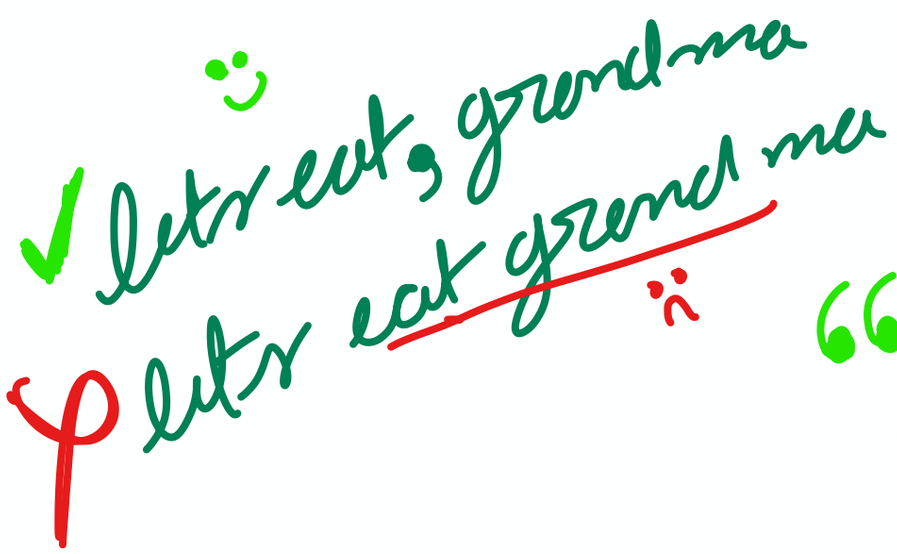
you show to your reader that the results of the previous studies to date are relevant.

to summarise the results of studies carried out previously

- And thus you say, researchers have found, studies have suggested.
- We also use the present perfect tense to indicate the connection with the previous studies
- Something has been done so far.

We'll also use this tense to indicate the connection of the previous studies,

- what has been done,
- to those that are currently underway,
- in how you will be contributing and how these findings will be contributing to your research.



“Punctuation”

Punctuation serves a crucial function in English.

In writing, punctuation substitutes all the messages that the spoken word can convey through intonation, gestures, humour, pitch, volume.

The absence or presence of a comma in the particular position can not only change the meaning of the sentence, it can sometimes reverse the meaning.

In other words the absence of a comma tells the reader that more than one of a certain thing exists in the context of a sentence.

Whereas the presence of a comma in that same place will tell the reader that only one of that thing exists for that context.

What would you ask?

- So, is this sentence easy to understand?
- Can I pin point what it is trying to communicate?
- Is it too lengthy or too brief?
- Are things properly explained in clear terms?
- Is this sentence interesting to read?
- Does it lead to the next point?
- Is the sentence written to inform?
- Is is too abstract or there is some conceptual clarity?

Type of Evaluation	% Contribution in Grade
(a) Review essay (group)	25
(b) Summary (individual; in class)	30
(c) Poster (Group)	25
(d) Class Test (Individual; in class)	20
Total	100