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Lecture 4

Scientific writing basics

By

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Basic principles in scientific writing

All scientific writing should follow the 7 C's-rule, i.e.

scientific writing should be:

1. Clear: Unmistakable, not leading to confusion

2. Correct: Accurate, free from error (Not prone to interpretation وتأويلand speculation تضارب

Complete: Contain all necessary parts and information to be clearly understood

4. Concise: :موجزto the point, devoid خاليةof redundant تكرار information and words.

5. Conform: مطابقto the requirements set by the university and to the standard conventions and basic principles in:

- **a. Style: units, rules of abbreviations ,مختصراتliterature citations etc.**
- **b. Format: shape, size, general make-up of a publication**

6. Consistent: :متناسقuniform throughout the text in spelling, structure, style, format, layout ,تنسيقtypography ,أسلوب الطباعة etc.

7. Common sense prevails

Structure of your Scientific Research

A research paper organized into several sections:

1. **the author states the purpose of the investigation, placing the work in a broader scientific context (Introduction).**
2. **the procedure is described (Materials and Methods).**
3. **the findings are presented (Results), interpreted (Discussion) and summarized (Conclusion).**

Title and abstract

- **Both the title and the abstract are very important parts, since these will be read most often by many readers.**
- **They serve two purposes for your readers:**

1. **to disclose the basic information of your research**
2. **to help readers decide whether or not to read the entire paper**


Structure of a Scientfific Research Paper
Title
Catchy and Descriptive
Abstract
Summary of the Study
Introduction
Background & Objectives
Materials and Methods
Experiments & Procedures
Results
Findings & Data
Discussion
Interpretation & Analysis
Conclusion
Summary & Implications

Title

1.The title should attract attention, but most importantly, it should be **informative and concise**.

2.A good title indicates the main point of the study, so use:

- **The most precise words possible.**
- **Words that lend themselves to indexing the subject** (your title is the first source for key words for indexing services).

3.The title should make sense to **someone not familiar with your subject**.

4.Provide suitable information, but don’t make the title too long: **8–12 words is a good range.**

Abstract

1. **Purpose of an Abstract:**
   - Gives readers a clear idea of the subject studied.
   - Helps them decide whether to read the full thesis/paper.
   - Provides key words for indexing.
2. **Characteristics of a Good Abstract:**
   - **Concise:** Maximum 1 page; condenses the full report by about 95%.
   - **Complete:** A stand-alone summary that does not need further explanation.

Abstract

Should include:

- **Objectives/hypothesis** and **justification** for the study (What, When, Why).
- **Basic materials and methods** used (How).
- **Main results** and **significant conclusions**.

3. What to Exclude from an Abstract:

Discussion of results.
References.
Tabulated data.
Abbreviations (unless universally understood, e.g., DNA, pH).

Introduction

The introduction places the work you have done in abroad theoretical context and provides the Reader with enough information to appreciate and understand the relevance your objectives. What The introduction should do?

1. Be **informative**.
2. Explain the **reason for the study** and the **major objectives**.
3. Clearly **identify the subject** of the research.
4. State the **hypothesis** being investigated or define the **problem** being solved.
5. Bring the reader **up-to-date** on existing research (what has already been done).
6. Provide **background information** on the research subject.

Literature review

- Typically, using the **simple past tense** is common, e.g., "Jones (2013) **found** that...." But it is possible to **use more than one tense** in a literature review. Here are a few tips to consider when presenting a review of previously published work:
- **Past tense**: If your focus is on the study itself or the people who studied it, then it is better to use the past tense. In this case, the study would be the subject of your sentence, "e.g., Jones (2013) **reported that**..." The past tense is most commonly used and is also known as "the reporting tense."

Literature review

- **Present tense**: If you are sharing your own views about a previous study, it might be better to use the present tense, e.g., "Jones (2013) **argues**."
- **Present perfect tense**: Sometimes, the present perfect tense is used if the research you are referring to is fairly recent, e.g., "Recent studies **have demonstrated** that...(Jones, 2015; Pinto 2014)". It is also used to make generalizations about past research in an area, e.g., "Several researchers have studied these stimuli..

You can check the paper in the link

https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1750-4910.2004.tb00526.x

Materials and methods

WHERE and HOW?

This section should:

- provide information such that your study can be duplicated/repeated by others
- describe procedures and methods used, e.g. sampling strategy/frequency /location/date, experimental design, tools and sampling devices used, manipulation of the samples, statistical analysis, data quality assurance etc.
- where appropriate, use flowcharts to visualize the processing methods and handling of your materials
- be organized logically and orderly. be written in the past tense

Results

- This is the most important part! The Results section should summarize the data, emphasizing important patterns or trends, and illustrate and support your generalizations with explanatory details, statistics, examples of representative or atypical cases and references to tables and figures.
- **Use the past tense.**

Discussion

The Discussion section should

- Relate your results to your hypothesis: do your results prove that your hypothesis is correct or not, and how/why?
- Interpret the results with emphasis on the problem, question or hypothesis you put forward in the introduction
- Relate the data to their causes: i.e. why the data are what they are
- Relate your findings to those obtained by other researchers: whether they corroborate your results or whether they don't and support this with evidence

Be careful with extrapolating your results too broadly: avoid speculation and generalization.

Conclusions

- **What conclusions can you draw from your findings (these can be enumerated)?**
- **What is their significance with regard to the problem you tried to solve?**
- **State briefly any implications for practical applications or future studies if appropriate**
- **Finally recommendations (if appropriate)**

Many scientific journals do not publish a separate Conclusions section, instead, Discussion and Conclusions are combined, but for a thesis, keep them separated.


Thank
you