Data Presentation: Technical Writing

- Research studies are usually presented for:
  - Submission of thesis (Diploma, MSc, PhD)
  - Publication
  - Participation in scientific occasions
    - Oral
    - poster
Having compiled their material for writing
- literature information
- results and observations
research writers can start drafting the principal outlines for writing their theses and papers.

The general layout of dissertations and papers is usually made by arranging the major and minor parts that make up a thesis/paper in a specific order.
Lay-out of Dissertations & Papers

Principal parts of lay-out:
I. Preliminaries:
   A. The title page
   B. Abstracts (English & Arabic)
   C. Preface
      - Acknowledgement
      - Biography
      - Frontispiece
      - Dedication
   D. List of contents
   E. Lists of tables/figures
II. The text
   This includes one section or more of:
   A. Introductory reviewing
   B. Materials and methods
   C. Results
   D. Discussion
   E. Summary
   F. (C & D are very often dealt with in one section).
III. References

- Bibliography
- Appendices

It is not unusual to have a and b in a reverse order.
Consult the instructions and requirements of each journal.

Theses & papers have in common:
- Title
- Abstract
- Introduction/ Materials & Methods/Results/Discussion
- References
- Acknowledgment

The order of sections may slightly vary
- Some journals use a numbering system plus or without subheadings.
Abstracts

- Summary of text
- No paraphrasing of title
- Brief but informative = important findings
- No ambiguous statements
  - e.g. the observations are compared with …
  - e.g. the results showed …
- Principal methods & objectives
Thesis & Papers

- Not decided at an early stage of research work, though the general area of a research project can be initially defined.
- A thesis title, therefore, is very often submitted just a few months before the final viva.
- The regulations of some universities limit the length of titles.
For example:

- Ph.D titles in the University of London must not exceed twelve words (100 characters) whereas the titles of dissertations submitted for other degrees are not necessarily limited.

- Titles may have as many key words are possible to project the principal problem investigated in the dissertation.

- Titles of these must be specific, brief and consistent with all information reported in the text.
Preface

- Acknowledgment
- Copyright/Dedication/
- List of Contents/Figures/Tables
- Biography
Introduction

- To acquaint readers with the presented work and the current status of knowledge on the subject
  - i.e. it explains how the investigation moves forward from the closely related, previous work on the same subject.

- State important views but no discussion
- Updated
- Objectives and rationale are indispensably stated
Introduction

- To convey important views reported in the literature and problems in question that entail further investigation.
- To state the reasons and objectives of carrying out his research projects.
- 2-3 paragraphs in papers & multisection thesis
- Literature Reviews state chronologically flow of information
Unlike thesis introductory accounts of papers are brief and precise (2 or 3 paragraphs).

Writing of introductory literature is not like writing a review article.

Also, try to excite the interest and attention of readers who are not specialists by avoiding platitudinous general statements.

Style and writing (grammar & spelling) must be effective and precise.
Materials & Methods

- Broad lines of experimental / non-experimental techniques
- It should also justify the student’s choice of any methods including the methods of statistical analysis.

- Experimental:
  - Determination of Ca++ level in blood of myocardial patients
  - Assessment of toxicity of car exhaust in Khartoum state

- Non-experimental:
  - Questionnaires & interviews
Materials & Methods

- Precision & accuracy
  - Full names (chemical compounds, plant sp., cultivar, equipment, study area etc.)
  - Purity%
  - Level of activity (enzymes)
  - Age, sex, wt, vol. etc.
  - Authority for system of nomenclature.
  - Use up to-date method
  - Ethics (Consensus, Helsinki, WHO, institutional & national committees)
  - Critical & explicit
State enough details for inexperienced investigators to repeat the required experiment.

However, it is pointless to give full details again of methods described elsewhere in a published work.

It is worth trying as much as possible to give:
- names & short addresses of the manufactures
- suppliers of chemicals and equipment used,
- registered trade names.
Results

- This section usually presents all results obtained in a number of observations or experiments investigating a specific problem.
- This section should be comprehensible, coherent and entirely based on facts and exact observations.
- Transformed derived data and the method used for their transformation or reduction must be clearly stated.
- But it is preferable to express our results as primary or original raw data.
Tables and illustrations are added to clarify the data obtained or a hypothesis that may originate from the results.

Results and discussion in a descriptive work can be combined in one section.

In theses, brief details of statistical operations should be mentioned only once if employed in any of the first experiments.
Confused or negative results must be stated in a brief explanatory way to help and guide other workers in future.

No discussion

Units (international) are added
- e.g. mg/L, Kcal, % conc. (wt/wt)

Statistics are indicated by:
- $S.E., S.D., CI, t, F, LSD, Z, X^2, n$, 

Results
Units (international) are added
- e.g. mg/L, Kcal, % conc. (wt/wt)

Avoid inconvenient digits
- e.g. $5.72 \times 10^7$ instead of 57200000
- e.g. $0.35 \times 10^{-4}$ instead of 0.00035

Prefixes indicating multiples and submultiples of units are used
- e.g. $1\text{Mv}$ and $1\mu\text{v}$ are preferable to 1000000 and 0.000001v.
Discussion

- Research subject is treated from different sides.
- Easily written, if you have managed to analyse and to explain your work in comparison with the findings of other authors.
- The validity of the result is assessed by making comments on the significance and relevance to previous studies.
- Negative results or discrepancies should not be concealed.
Instead, students must verify -ve observations or else admit their inability to do so.

Over-optimism about the precision of the work, and the generality of conclusions on the applicability of the results must be carefully avoided.

It must be understood that researchers are allowed to point out any results that suggest new lines of their study.
Bibliography

- A suitable heading chosen for this section in dissertations
  - References
  - References Cited
  - Literature Cited
- Journals may favour specific headings and therefore research writers should consult the editor’s instructions on this matter.
Two important systems are used nowadays to cite and list references.

Numerical system
- The first is the less common system, followed by some journals
  - Pesticide Biochemistry and Physiology,
  - Nature and Developmental Biology.
- References cited in the text are indicated by numbers enclosed in parentheses.
The second system is known as the Harvard system. This is used to cite and list references in theses or dissertations.

An important feature of the Harvard system is that:
- Initials of authors' names & dates of publication are mentioned in the body of the text.
- All references are listed alphabetically at the end of papers or theses.

In the text, references are written in brackets indicating the author's name and year of publication:
- e.g. (Brenner, 1984)
- except when the author's name is part of the sentence,
  - e.g. Bridge (2005) showed that.........'.
References arranged in a list at the end of theses or articles as follows:

- The name(s) with initials of author(s) are written first,
- The year of publication (in brackets or without)
- The title of the paper,
- The title and volume number of the journal
- The number of the first and the last pages.

For example:

Many journals prefer to have the author’s name(s) fully in capitals

For example

- *Parasitology*
- *Annals of Tropical Medicine and Parasitology*
- *Journal of Anatomy and Immunology*

If the titles of journals are to be abbreviated, this should be done in accordance with:
- The International List System
- The world list of scientific periodicals

However, the full title of a journal is written if we cannot find its abbreviated title.
- Titles made of one words are not abbreviated; no full stop at end of complete words.
Author's name(s) that appear in a list of references of theses or dissertation are all typed in capitals.

Connective such as “van”, “de”, “von” and ‘al’ are alphabetically arranged according to choice.

The terms ibid or similar abbreviations like idem and loc, cit, when the names of the same author(s) or a journal title occur in successive references

A few journals like Nature do not request the titles of papers on the list of references.
More than one reference are chronologically listed under each author.

This is easily indicated by adding a lower case latter a, b or after the author’s name and the date.

For example:


When reference is made to a book written by one author:
- The title should be underlined or italicized;
- The edition volume number (vol)
- The page (P or pp) should be given followed by the place and name of the publisher


- The total number of pages in a book should be written as 550pp, not p 550 or pp. 1-550.
Papers cited from a book edited by a number of authors,


Some journals (e.g. Parasitology) would like to have the articles title stated as in:

If writers refer to any papers written in a language other than English


Theses and dissertation are referred to as in the following hypothetical example:

Bibliography

- Name of an organization (for example, Ministry of Agriculture) as the author of a report or similar publication when no editor is named.

- Technical reports as references
  - e.g. Stubbs, A. (1965). Forage use and Nutritional level of 1235 Texas families (Bulletin N. H-B-1033), Agricultural Research Station, State College Pensylvania.
Bibliography

- Papers cited from a book edited by a number of authors,

- Some journals (e.g. Parasitology) would like to have the articles title stated as in: