

Chapter II - Exploitation of a text

Scientific writing

1. Writing and structure of the thesis

● The outline

Developing an outline (the skeleton of your thesis) is an essential step because it facilitates the writing process, ensures that the main points to be developed are not forgotten, and that the sequence of ideas follows a clear and structured logic. There is no standard outline, but a research thesis generally consists of 6-7 distinct chapters:

1) Introduction, 2) Method, 3) Results, 4) Discussion, 5) Conclusion, 6) References,

The **IMRAD** structure:

<i>I</i>	Introduction
<i>M</i>	Materials and Methods
<i>R</i>	Results
<i>A</i>	<i>And</i>
<i>D</i>	Discussion + Conclusion and Summary

1.1. Cover Page (Page de Garde):

On the cover page, you typically find:

- The name of the educational institution and its affiliated entity.
- The type of written work (end-of-study thesis, master's thesis, or doctoral dissertation).
- The title of the work.
- The student's name.
- Members of the evaluation committee (Chair, Supervisor, Co-supervisor, and Examiners).

1.2. Dedication:

This is a dedication of this work to a special person or several individuals in order to honor them. It is placed on one page (in the middle) that does not include anything else.

1.3. acknowledgments:

This section is dedicated to individuals who directly or indirectly contributed to the completion of this research work. It begins with gratitude to:

1. The institution where this work was carried out and the laboratory or location where the fieldwork was conducted.
2. The supervisor and assistant supervisor for the advice and guidance provided.
3. The committee chairperson and the remaining members for accepting the contribution to the thesis, each by name and degree.
4. Those who contributed, whether closely or remotely, to the completion of the work as consultants or in assistance.

1.4. Table of Contents:

The table of contents presents each part of the work and its sections, accompanied by a reference to the corresponding page in the text. It allows the reader to quickly get an overview of the content and navigate directly to the section of interest.

Table of Contents	
List of Abbreviations	
List of Tables	
List of Figures	
General Introduction	
	CHAPTER I:
I. Introduction	
I.1.	
I.2.	
I.1.2.	
I.2.2.	
...	
...	
	CHAPTER II:
General Conclusion	
Annexes	
Abstract	

1.5. Lists:

1. List of Abbreviations: Abbreviations for long names of materials and tools, arranged alphabetically (ultraviolet UV).
2. List of Tables: Arranged according to the table numbers in the text.
3. List of Figures: Arranged according to the figure numbers in the text.

1.6. Introduction

- 1^e Part 1 outlines the general aspect of the problem
- Part 2 raises the specific aspect of the question
- Part 3 announces the objective of the work

1.7.Materials & Methods

This chapter must describe:

- Precisely the population on which the study focused
- The step-by-step process of the study
- The text:Must be written **in the past tense**
- Must not include any results or comments
- The reader must be able to verify the work carried out in order to judge its credibility

1.8.Results

- Must present all relevant results, without commentary
- Must be written in the past tense.
- Must follow a logical order.
- Figures and tables allow you to convey as much information as possible in a concise and clear manner, using a minimum of space.

1.9.Discussion

- The aim is to interpret the work carried out. It is important to express your personal opinion without using emotional language.
- Do not repeat what was said in the introduction No new results should be given
There is no standard outline, but the objectives are:
 - State whether the objective set out in the introduction has been achieved
 - Compare the results observed with those of other studies.

1.10.Conclusion

- It highlights the key messages of the study
- It may conclude by expressing uncertainties, suggesting unknowns, and opening up avenues for future work

1.11. Bibliography:

In this section, all references used in the completion of this work are gathered. References are categorized in **alphabetical** order by the main author's name. If there are multiple references by the same author, they are arranged in ascending order based on the publication years.

1.12. Abstract and Keywords:

The abstract is a concise version of the article or thesis and is written at the beginning of the article or at the end in the case of a thesis (in this case, it is written in all three languages: French, English, and Arabic, and the chosen language for writing is indicated on the outer cover of the thesis). Through the abstract, the reader gets an overview of the essential points in the written work, including the methodology and results obtained.

- Structure it according to the IMRAD format with two or three sentences per chapter
- It should not contain references or abbreviations

Writing a Scientific Article**1/ What is a Scientific Article**

A scientific article is a published written work intended for experts, specialists, students, and researchers. Its structure and level of reading demand specific skills. Scientific articles typically contain few illustrations, photos, or advertisements. A brief abstract precedes the main content of the article.

2/ The Structure of a Scientific Article

The first page should include the title, author's name, and the address of the laboratory where the work was conducted.

• The Title

It should be short, comprehensive, and captivating. Generally, it is written last to accurately represent the presented work. A subtitle may be included if the main title is too lengthy.

• The Authors

Authors are individuals who actively contributed to the conception of the research work. The initiator and designer of the project should be listed last. Authors who conducted the study and contributed significantly to the work are mentioned first, each with their substantial contribution. Individuals who played a more distant role in the study are acknowledged in the acknowledgments section.

• Abstract

The construction of the abstract depends on the guidelines provided by the publisher. Generally, it should present a well-defined structure, including the purpose, materials and methods, results, discussion, and possibly the conclusion, using bibliographic references. The word count should not exceed approximately 250 words, with each word counted.

• Keywords

Keywords are important and informative words related to the content of the article. Reading scientific literature helps increase knowledge and improve critical thinking, requiring an understanding of how a scientific article is structured.

The foundation of a scientific article is the IMRAD structure

Research Paper Structure	
Title	Clearly states the topic, key variables, method of scope, and includes a hook to engage readers
Abstract	Summarizes the research by outlining the objectives, methods, key findings, and conclusions
Introduction	Provides the research context, defines the problem, explains its significance, and states the objectives
Materials & Methods	Details the research design, data collection, and analysis methods to ensure reproducibility
Results	Reports the main findings of the study, supported by tables, figures, and descriptive statistics
Discussion	Interprets the results, compares them with prior studies, and highlights their implications
Conclusion	Summarizes the key findings, contributions, limitations, and suggests future research directions
References	Lists all cited works in full and consistent detail

• Introduction

This initial section of the report should provide a detailed presentation of the scientific context, the novelty, and the objective of the work you have undertaken. It may also outline the structure of the report (presentation of the plan) without presenting all the obtained results.

Project Theme: These are a few sentences (2-3 max.) contextualizing the theme of your report. The introduced subject should initially be somewhat "broad" and then gradually narrow down to the specific issue.

Problem Statement: Clearly articulate the problem statement of your work in a simple, concise, complete, and precise interrogative sentence that outlines your problem.

Hypotheses: Describe how you expect the experiment to unfold, the anticipated result(s), possible explanations, etc. Your hypotheses should be verifiable and capable of addressing your problem statement.

• Materials and Methods

This section presents the essential information necessary for understanding and replicating

the experiments described in the report.

- **Results**

This section should exclusively present all the results—announcing and demonstrating without drawing conclusions. It is advisable to use relevant tables and/or graphs with clear titles and explanatory legends.

- **Discussion**

In this section, a comparison with studies previously identified in the literature review should be presented. Some journals prefer to combine results and discussions into a single chapter.

The objective of the discussion is to address the posed problem statement. As the name suggests, this part should provide a commentary on the obtained results. The discussion should inform whether the results are statistically or clinically significant and identify any potential biases.

➤ For each of the studied parameters, you should:

Recapitulate the results by citing them and referring to the table and figure numbers.

Explain these results by comparing them to the existing literature, with references to support your points.

Recap and validate your hypothesis (refute or confirm).

Discuss potential sources of errors and critique the methodology if necessary.

Provide a "mini-conclusion" for each paragraph, highlighting the essential element.

- **Conclusions**

In this section, the main contributions of the work to addressing the questions and achieving the objectives presented in the introduction are outlined. To draft this section, consider the question: "What should the reader take away from this work?"

Additionally, discuss the perspectives opened up by the obtained results.

- **References**

Every time you cite statements from an author or a work, you must provide the consulted reference.