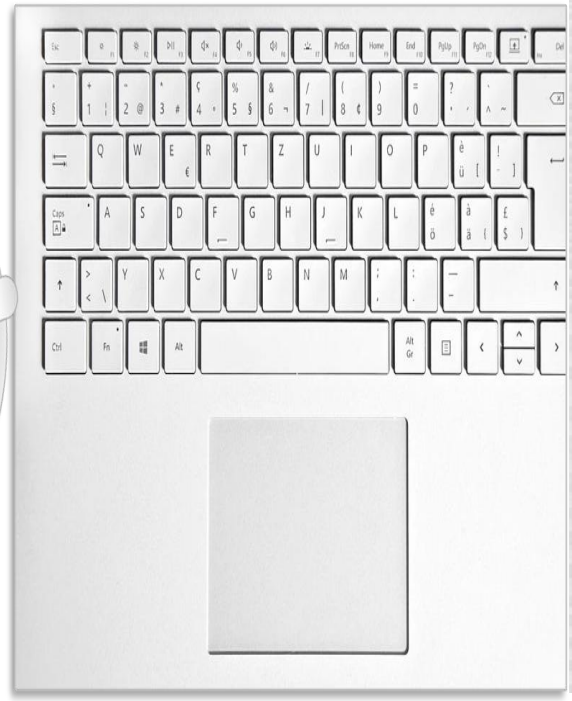
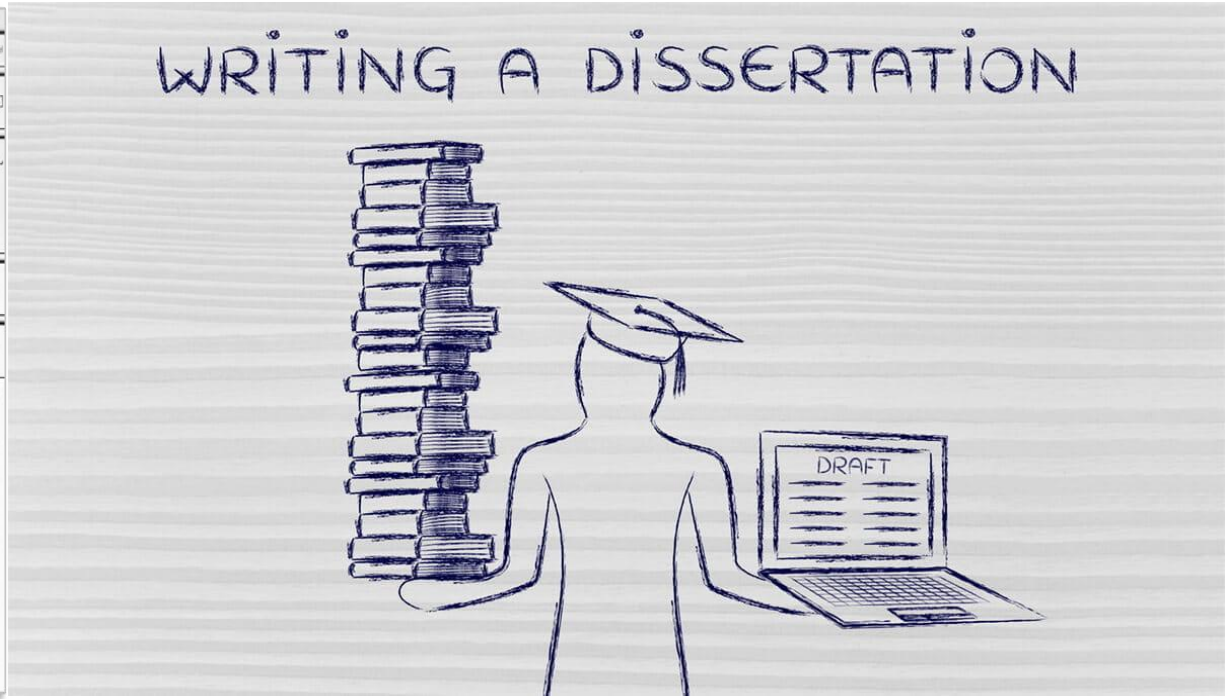
Chapter 1: Writing a scientific report

Course 4. Writing a dissertation and thesis (Memoire, These)





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Course Objectives

Objectives:

- Define what a Master's dissertation is.
- Understand the purpose and importance of a dissertation.
- Identify key characteristics of a well-structured dissertation.

Key Points:

- A dissertation is an advanced research project that develops analytical and scientific skills.
- It allows students to specialize in a research area and enhances their job prospects.
- It follows specific norms of presentation and structure.

Introduction

Scientific work follows a specific research method to develop its ideas and **give structure to the content of the dissertation**, it also needs to meet some methods and **norms** of presentation that show the **form of the dissertation.**

The **purpose** of this course is to prepare the student to **write a dissertation** that **conforms** to the **presentation norms** of a **Master's dissertation**

Course description

1. Definition
2. Dissertation types
3. Master's dissertation structure (IMRAD)
4. Theoretical framework
5. Characteristics of test presentation in the dissertation
    - Pagination and page formatting
    - Advice on text typography

Definitions

1.1. Definition of a master's dissertation

A **Master's dissertation** is a **report** or scientific presentation.

It consists of an advanced research project that enables a student to treat a specific topic according to a research methodology, in order to:

- -Respond to a specific problematics.
- -Developing a scientific, critical, synthesizing and analytical capacity
- -Develop the ability to explain and defend ideas, to demonstrate and argue, and especially to improve intellectual skills.

- ✓ A **Master's dissertation** is a formal academic document that presents the results of an independent research project conducted by a student as part of their Master's degree.

- ✓ It demonstrates the student's ability to **formulate a research question, review relevant literature, apply appropriate research methods, analyze data, and present findings in a structured and coherent manner**.

- ✓ **The dissertation** is prepared according to specific academic and formatting directives, contributing to the advancement of knowledge in a particular field of study.

1.2. Dissertation objectives

The **aim of the Master's dissertation is to**:

- **Understand** the key components of a dissertation.
- **Improve** academic writing and citation skills
- -**Assist and help** the **student** in **practicing research** and mastering some of the methods and techniques of research, knowing that the dissertation is the student's first research exercise.
- -**Offer the student** the **opportunity** to focus on a more specific domain of research that will become their domain of expertise.
- -**Obtain a job** (directly or indirectly by obtaining a master's or doctorate).

2. Types of master's degrees

In general terms, there are two types of Master's **degrees** :

Each type has distinct objectives, methodologies, and expectations.

➢**Research dissertation (academic):** Characterized by a synthesis of the literature, it requires a clearly defined problematic based on hypotheses and/or research objectives.

➢ **Professional dissertation:** Focused primarily on practical aspects. The student is expected to be directly implicated in a professional project. They are considered interns in the establishment where they do their dissertation.

Research Dissertation (Academic)

A **research dissertation** is a scholarly document that explores a specific research problem through **theoretical analysis, data collection, and interpretation**. It is **problem-driven**, meaning the student must define a clear research question or hypothesis and investigate it systematically.

Characteristics:

- **Synthesis of Literature:** A detailed literature review to establish the research context.
- **Problematic Approach:** Clearly defined research questions, hypotheses, and objectives.
- **Methodological Rigor:** Application of qualitative, quantitative, or mixed research methods.
- **Original Contribution:** The study should add new insights or findings to the academic field.
- **Structured Presentation:** Follows the IMRAD format (Introduction, Methods, Results, and

Example:

A student in **Microbiology** conducting a research dissertation might investigate:

"The Effects of Ultrasound-Assisted Activation on Thermostable α-Amylase Activity."

- **Problematic:** How does ultrasonic irradiation affect enzyme stability and efficiency?
- **Methodology:** Experimental analysis using Response Surface Methodology (RSM).
- **Results:** Data interpretation based on enzyme kinetics and structural modifications.
- **Conclusion:** Findings contribute to enzymology and industrial biotechnology applications.

Professional Dissertation

A **professional dissertation** is designed for students who engage in practical, real-world projects, often within a company, hospital, laboratory, or government institution. It is **solution-oriented**, meaning it focuses on applying knowledge to a professional context rather than generating purely theoretical insights.

Professional Dissertation

Characteristics:

- **Practical Implementation:** The student works on a real-world problem within an organization.
- **Internship-Based:** Conducted in collaboration with a professional establishment.
- **Project Management:** The dissertation often involves evaluating and improving professional practices.
- **Limited Theoretical Component:** Emphasizes applied research rather than extensive literature synthesis.
- **Deliverables:** May include reports, technical documents, recommendations, or intervention strategies.

Professional Dissertation

Example:

A student in **Biotechnology** completing a professional dissertation might work on:

"Optimization of Fermentation Conditions for Industrial Enzyme Production in a Biotechnology Firm."

Internship Site: A bioengineering company specializing in enzyme manufacturing.

Project Scope: Developing cost-effective fermentation protocols for enzyme production.

Methodology: Conducting pilot-scale fermentation trials and optimizing conditions.

Outcome: Proposing industrial recommendations to improve production efficiency.

DISSERTATION STRUCTURE

Writing your dissertation takes time and a number of revisions/drafts, so start writing up parts of it as soon as is practical

- **Cover page** (Organization, Title, Author, Jury, Date)
- **Acknowledgements**
- **Dedication**
- **Table of Contents**
- **Abbreviations**
- **List of tables**
- **List of figures**
- **Main body**
- Bibliography
- Appendices
- Abstract

- Introduction
- Literature review
- Methodology
- Findings
- Analysis/Discussion
- Conclusions
- Recommendations

1. Cover Page

- University name and logo.
- Title of the dissertation.
- Student’s full name.
- Name of the supervisor(s).
- Degree program and faculty.
- Submission date.

2. Acknowledgments : Expressing gratitude to supervisors, colleagues, institutions, and family.

3.Table of Contents; Includes all headings and subheadings with corresponding page numbers.

4. List of Figures and Tables; Enumerates all figures, graphs, and tables with their titles and page locations

Individual writing tasks*

- **Abstract** (200-300 stand-alone summary of all the above)
- **Introduction** (context, focus, aims, objectives of the dissertation)
- **Literature review** (summarises existing knowledge around the topic)
- **Methodology** (how you found things out)
- **Findings** (what you found out)
- **Analysis/Discussion** (understanding findings, discussing what they mean)
- **Recommendations** (any further actions suggested by those findings)
- **Conclusions** (key things those findings indicate, clarify or confirm)

Introduction:

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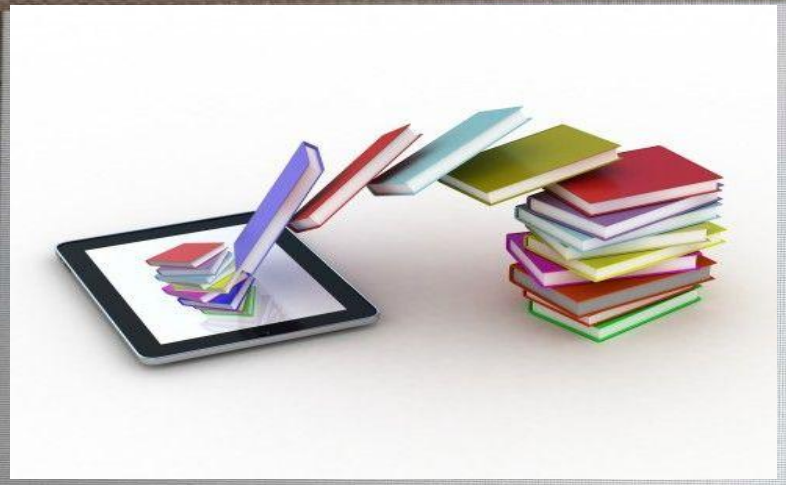
How to write a Dissertation Introduction

First paragraph	• What is known
Second paragraph	• What is unknown?
Third paragraph	• Why the study was done

Tips for writing introduction:



Begins with a general overview

More specific

Narrowing to the thesis statement

Avoid repetition of similar ideas

Text that has not published can't be included

Key Points To Write Review of Literature:

Review of Literature are not summaries but arguments.

- It must contain necessary information and all major work on the topic.
- Reviews should involve synthesis
- Only put material which help in research.
- Copy and Paste of abstracts from paper is not acceptable.
- Read the abstract, understand it and then rewrite it briefly in your own words.
- Cite the reference of paper along with each abstract.
- It is good to initially start with reading review articles .

Materials & Methods:

Objective:

- To explain what work was done and how it was done.
- To explain why I chose the methods.

Word range:

- Detail of experimental work in about 500-1000 words

Tense:

- simple past tense

Elements:

- Details of instrumentation
- Sample collection
- Reagents used
- Experimental techniques.
- Appropriate controls
- Experimental conditions

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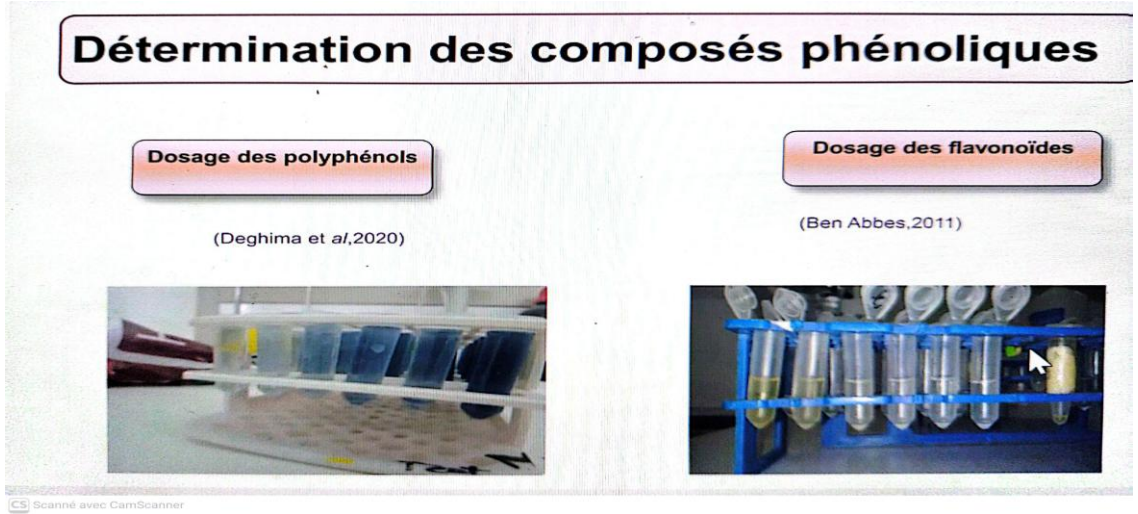

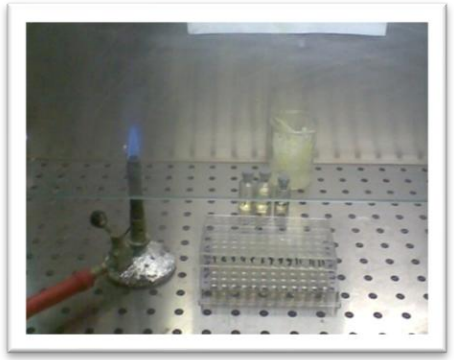

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Tips for writing Materials & Methods:

- Start writing while you are performing your experiments.
- At the end match the order of methods & results of your experiments.
- Methods section and result section should be clearly rel
- Always includes citations for procedures that have been described previously.

Results:

It describes

- Findings of your research
- Observations of your experiments
- Your own data with evidences

Objective:

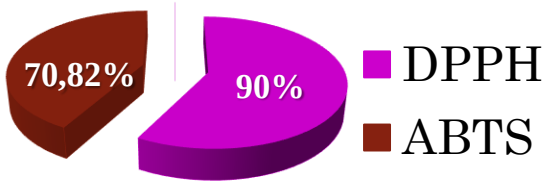
- The objective is to present a simple, clear and complete account of the results of your research.

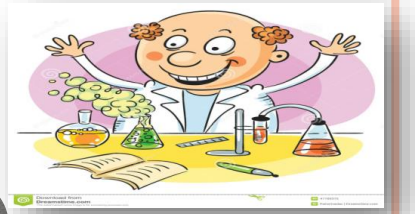
Word range:

- Contain about 500-1000 words

Tense:

- Past tense





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Tips for writing results:

It does not include

- Discussion
- Interpretation
- References

It is easiest section to write (*if you recorded the results carefully*).

Representation of data:

- Pictorial form
- Tabular form
- Graphical form

Discussions:

Discussion is the most original write-up because it contains writer's own point of view.

Objective:

- To interpret and describe the significance of your findings.
- To connect to the introduction by way of research questions or hypothesis.
- To explain how your study has moved reader's understanding of research problem.

Word range:

1000-1500 words.

Tense:

Present tense.

Conclusions:

The opinion you have after considering all the information about something.

Objective:

- To summarize your principal findings
- To emphasize on what should now be accepted established knowledge.

Tense:

- Past Tense

Features:

- It should relate back to the introduction.
- Must contain summary of evidences supporting each conclusion.
- Give significance of your results & any practical

Types of References:

There are two types of references:

- **In text citation:**
  - As source of information
  - This demonstrates support for your ideas, arguments and view.

- **References/ Bibliography:**
  - Complete details of everything you cited
  - Appears in an alphabetical list
  - At the end of your thesis

Abstract; A concise **summary (150-300 words)** covering:

- Research problem or project goal.
- Objectives and methodology.
- Key findings and conclusions.
- Keywords (3-5 words).

Writting each chapter

1. Don’t start with the introduction or conclusion
2. Start where you feel happiest
3. Typically a middle chapter
4. Write outwars (conclusion)
5. Finally conclusions and end with the introdaction

5. Characteristics of dissertation test presentation

The form of the manuscript plays a major role in the quality of the work, and although there are various types of presentation, the most commonly used are:

Margins and paper format:

- A4 format (21cmx29.7cm).
- Page margins: 2.5 cm on each side (left, right, top and bottom).

Pagination: from the first page of the introduction to the last page of the conclusion.

- Pages are numbered at the bottom.
- Unnumbered interleaves (Intercalaires)