

Chapter IV – Dissertation and Thesis

Bases and Characteristics of Academic Writing

IV.1. Introduction

In all universities and disciplines, at the end of their graduation or post-graduation training cycles, students are recommended to write a dissertation or a doctoral thesis. This constitutes the culmination of academic training or research cycle, and testifies of the student's ability to accomplish an academic writing work, scientific synthesis and convincing logical presentation of his graduation or research project.

These academic writings are subject to methodological rules and conventions that aim to ensure the respect of scientific method, the bases of academic writing, as well as the respect of scientific ethic. These rules also aim to standardize academic writing in a given field or in a given institution.

Although there are rules and conventions that guide academic writing, they are not all exhaustive nor mandatory. Thus, some variations can be between academic disciplines in the conventions and expectations that apply to the writing of assignments, dissertations and theses. It is therefore important to consult carefully with your university information services, specialists, tutors, supervisors in order to be informed of the conventions that apply specifically to your own field of study.

IV.2. Dissertations and Theses

IV.2.1. Definitions

Dissertation (or Master's thesis) is must write a dissertation a written presentation of the results of a research work prepared by Graduate students, it attests of their aptitude for research and the ability to clearly present the results of their work. According to certain considerations in biomedical field, a dissertation can be a theoretical synthesis around an item of interest, or a report of the results of an experimental or practical work carried out in the laboratory or in the field.

However, a Doctoral Thesis is an academic writing that presents the results of a large-scale research work carried out by a Postgraduate student. Doctoral presents research work that makes an original and significant contribution to the advancement of knowledge. In biomedical field, Doctoral thesis must reports original results of an experimental or practical work carried out in the laboratory or in the field, and usually preceded by the publication of scientific article(s).

IV.2.2. Some considerations concerning dissertations and thesis

- The dissertation is the culmination of an academic formation, while the doctoral thesis is the culmination of scientific research project.
- Both dissertation and thesis are academic and scientific writings that are subjected to scientific and ethical rules and conditions (observation, measurement and analysis, appropriate sources and references, etc.) enabling to judge of the quality of the scientific approach, the authenticity of the data and the accuracy of the results to be judged. The presentation of bibliographic sources, citations, tables and graphs must meet the usual conventional standards.
- Theses and dissertations require careful writing, they must be written in a clear and concise scientific style, and respect the standards of scientific expression.
- The two manuscripts are prepared under the direction of a supervisor, and possibly a co-supervisor, who ensures good writing in compliance with scientific and ethical rules and considerations.
- Doctoral Thesis reports original results, which are the results of high-level, reliable and authentic research work; which is not so required for a master's thesis.
- The length of dissertations and theses is one of the most notable differences. In fact, the length of the doctoral thesis is much greater than that of the master's thesis. The volume of theses and dissertations varies by university requirements for master's and doctoral work.
- Doctoral Theses are always prepared as part of a sponsored and fully funded scientific project. While the master's thesis does not generally benefit from all this interest, it may just be a theme proposed by the supervisor without any support.
- Generally, the dissertation or thesis must be written in national language. Exceptionally, in cases where special authorization is granted, they may be written in a language other than national language (English).
- The dissertation and the thesis have a standardized presentation, which is the same and common for an institution or in a country. This presentation must meet standardization criteria in order to facilitate their reproduction, conservation and distribution.
- Given that the doctoral thesis is the result of research work, it must be relevant and make some contribution to the advancement of knowledge, it must demonstrate that the candidate has scientific research and writing skills.
- Finally, thesis and dissertation are public documents; they are publications that must be made available and accessible to the public, which is done by depositing the manuscript in libraries and institutions websites normally as soon as after they are defended.

IV.2.3. Thesis Director (Supervisor)

Thesis and dissertation are prepared under the guidance of a Thesis Director, commonly called Supervisor; this later must meet certain requirements, and owes a certain number of responsibilities.

- The thesis director must be a specialist in the field in which the student would like to carry out his research. He must be very competent, mastering his field well and possessing the material and scientific means that allow carrying out, to perfection, the work proposed. The Supervisor must master the theme chosen for the research and, in lesser degree, the disciplines allowing to treat the theme.
- The supervisor is responsible for proposing themes and research topics, defining them, explaining their objectives and explaining the methods of their achievement to his students (doctoral or graduation students).
- Supervisors have primary responsibility of providing guidance to students in the choice of a suitable field for research or topic for a dissertation, bearing in mind that the research must be capable of completion within the period allocated.
- Supervisors are responsible for providing guidance about the nature and techniques of research, about the planning of the research programme, about the results expected of the research.
- The supervisor must show the student the basics of scientific research and bibliographic documentation. He must accompany him in the establishment of the work plan, the realization of the experiments and the analysis of the results; as well as showing him the basics of scientific writing. The supervisor must advise and correct his student throughout the realization of the work of the thesis, and at each stage until the final defense of the thesis.
- The supervisor must explain, help and facilitate the administrative procedures for the student, such as registration for the theme, the terms and conditions for submitting the dissertation or thesis; and up to the defense, correction and final deposition of the dissertation or thesis.
- The supervisor also has the obligation to motivate the student so that he can carry out the work well, to encourage him to develop his skills, to encourage him to take good initiatives and to help him become autonomous.
- Finally, the supervisor has the moral responsibility to remind and incite to student the work in accordance with scientific ethics, respecting the principles of the scientific method, and avoiding errors of scientific misconduct and plagiarism.

In some cases (Mixed theses, Co-supervised theses, Multidisciplinary Thesis, External Supervisor, etc.), an Assistant Supervisor or Co-Supervisor is designated to assist the Main Supervisor (Lead Supervisor). Assistant supervisors have an equal role and responsibility to the lead supervisor with respect

to supervision of the student's work; thus, a co-supervisor should participate in much of the responsibilities outlined for lead supervisors above. However, it is normally the principal supervisor's task deal with major and final decisions.

IV.2.4. Thesis and Dissertation work

Like any scientific or academic research work, thesis or master's work is developed in several stages, which are also subject to the rules of research and the scientific method.

- 1- Choice of research topic:** The choice of a research subject is an essential step in the realization of a dissertation or thesis. Generally, for thesis, the topic is proposed as part of scientific research project. However for dissertation, higher institutions offer a multitude of subjects from which students choose, but in some cases, students can opt for themes other than those provided, as long as they correspond to the general context of the their formation and are accepted by their supervisors. The themes chosen must first of all be relevant, having relevance for student professional career ambitions, obviously highlighting the theoretical and practical knowledge acquired. Second, topics should be accessible, achievable, and affordable for students. Finally, the topic should inspire students and help them to drive the work and to excel.
- 2- Bibliographic research:** This consists of documentary research around the chosen theme. It aims to better develop the chosen theme, to get an idea of the state of the art on the subject of the work. It thus allows to define the problematic, to formulate the question, and to outline the objectives. This step also makes it possible to define the work methodology and the project implementation plan. This step must be conducted rigorously according to the rules of bibliographic research reported previously (see previous chapters), and must continue throughout the preparation of the thesis and the dissertation until the final deposition.
- 3- Elaboration of the work plan:** It aims to define the stages of developing the theme, of putting in order these stages and their logic of realization. In this step, we define the work methodology, the necessary equipment, and even the alternatives available in case the initial plan shows problems. The work plan must be structured, logically rigorous and gradually responding to the problem.
- 4- Conducting the work, Collecting and analyzing results, and drawing conclusions:** This stage constitutes the heart of the thesis or dissertation work, and takes the great part of time. This involves applying the work plan drawn up in the previous stage, carrying out the experiments, collecting the results obtained, compiling and analyzing them and drawing the relevant conclusions. If it is a theoretical work (some master's theses), this step will concern the definition of the chapters constituting the body of the thesis, to collect the bibliography necessary for each chapter, and to sort it according to the parts concerned.

- 5- Manuscript Writing:** This is the final step in the doctoral or master's work. This step is essential to present the results and data obtained, and the summaries of the bibliographic review. It is about gathering bibliographical synthesis, general synthesis of the results, global analysis of the work and the final interpretation with a view to the writing and the public defense of the thesis. The writing of the manuscript is subject to the conditions and responds to the considerations of scientific writing. It must adopt the scientific style and must respect the conventional scientific standardization of writings as well as the requirements recommended by the institutions to which the student is attached. This step requires a long breath from the student, as it requires several repetitive phases of writing, reading, editing and proofreading before setting up a final defensible version of the manuscript.
- 6- The deposition and thesis defense:** This is the last stage in this long course of thesis or dissertation. Once finalized, the manuscript (thesis or dissertation) is submitted to the scientific authorities of the department or faculty for an initial admissibility assessment. If admissible, the manuscript is sent to an examination jury for a thorough evaluation, the examiners of the Jury will then give their opinions if the thesis is defensible or not. When the student obtains authorization to defend the thesis, a date will be set to allow the candidate to present and defend orally his work publicly before the same Jury that examined the manuscript, in the presence of the supervisor and the co-supervisor. If everything goes without reservations, the duly corrected final version of the thesis is deposited to the authorities of the department or faculty (Administration and Libraries), so that the student can get his diploma.

IV.3. Structure of Dissertations and Theses

A dissertation or thesis structure is the arrangement of research contents; this structure is conventionally standardized. It contains numerous parts that are also divided into paragraphs; these parts are defined by Titles (headings) and subtitles (subheadings). The good structuration of thesis is essential to the flow of ideas; it facilitates reading and information transmission. The key to a good dissertation is structure, which needs to be logical and coherent. The reader needs to be able to follow the information, analysis and argument throughout the manuscript.

Manuscripts consist of the major following sections and should be placed in the order listed:

IV.3.1. Preliminary parts

These parts are common for all kinds of thesis or dissertation , they contain the following sections or pages:

- **Title page (required):** A dissertation or thesis starts with a title page. It contains the essential informations such as the name of the institute (faculty and university) where the research is being submitted, the name of the student, the research title, the name of Supervisor and Jury members. Different disciplines require different arrangements of the title page components. The title page is highly required; it is the first presentation of the manuscript.
- **Acknowledgements (required):** In an acknowledgement individuals who helped through the research are mentioned. Individuals mentioned include supervisors, parents, spouses, children and friends, or any other person who helped in the work.
- **Dedication:** In this section the student cites the persons to whom he wants to dedicate his work; generally they are the parents, family, friends ...etc.
- **Abstract (required):** It is the research summary. An abstract gives the overall goal of the research in a page or less. The abstract should transmit a clear ideas of the whole research since it contains the essential parts of the work; Background and Aims, principal Methodology, essential Results (great finding) and Conclusion. Some institutions have a word limit of the abstract that need to be adhered to the latter. Despite its location in the dissertation structure, an abstract is often written last after the whole research is done. Although some people prefer to write it first since it provides a framework for writing the dissertation. An abstract must be short but concise. A list of relevant keywords is usually mentioned separately at the end of the Abstract. If the manuscript is written in language other than national language (Arabic), an Abstract in national language is required and put first (before other Abstracts)
- **List of figures and tables (required):** This list summarizes all the figures and tables, their numbers and titles, and the pages where these figures and tables appear in the manuscript..
- **List of abbreviations (required/optional):** It lists the Abbreviations and symbols used in the manuscript. The abbreviations are written with what they represent (or definition), and they are arranged in an alphabetical order.
- **Table of content (required):** It lists the principal headings (Titles and parts) of the manuscript; the pages where these headings appear must also be mentioned.

These pages are not paginated (counted) in the manuscript, or are generally paginated in Roman numerals (I, II, III , i, ii, iii ... etc).

Body of thesis/dissertation

IV.3.2. Body of Dissertation and Thesis

The body of dissertation or thesis, sometimes called the core, is the essential part of the manuscript. It reports the real work of the student. This part of the manuscript is fully paginated with Arabic numerals

Depending on the work carried out, theoretical or practical, we can find two major of dissertation or thesis body.

IV.3.2.1. Theoretical dissertation body structure

Theoretical dissertation is a literature-based dissertation that consists of a reviewing of the data found in existing literature rather than found through primary research. It may also include information from primary sources such as original documents or other sources. Theoretical reviewing structure, in Biomedical sciences, concerns only and rarely dissertations because for These it's required to be a practical (experimental-based) work.

The core of theoretical dissertation is mainly structured in chapters in which dissertation topics are reviewed. The main body of dissertation is generally organized as following:

- **General Introduction:** it represents 5-10% of the body text, and it introduces the topic of dissertation and its wider context, formulates the research question/problem that will be addressed in the dissertation and explain its significance and (possibly) why it was chosen. Introductioion also defines the scope of the dissertation, explaining any limitations. Fonally it describes the structure of the dissertation, signposting the reader through each section and providing any key definitions.
- **Chapters:** usually between 3 and 5 chapters – each one 15-25% of the body text, these are organized thematically - each chapter reviews and discusses the literature relating to a different aspect of the research area. Each chapter should have its own mini-introduction, main body and sometimes a mini-conclusion.
- **General Conclusion:** it represents 5-10% of the body text, and draws together the conclusions and main points from all of the chapters. This is where the student revisits the research question/problem, seen in the light of what has been reviewed from literature. The student may make suggestions for further research and perspectives.

IV.3.2.2. Practical dissertation/thesis body structure

It is an experimental-based dissertation/thesis in which student reports his own work (primary or original research), results and conclusions. The structure of practical-based dissertation/thesis body text is in fact a detailed model of IMRAD structure. It is generally organized as following:

- **Introduction (5% of the body text):** this part sets a clear presentation of the dissertation/thesis purpose. Specifically, it aims to make it clear to the reader by explaining exactly what will be investigated, why that is important, and how it will be investigated. Four key elements are briefly described in this section: **(i) The Context:** the state of art around the topic of dissertation or thesis, what is the main work that has been done that gives rise to the question and what is its significance?. **(ii) The Problem:** which is a concise statement of the research question or issue that the thesis addresses. **(iii) The Method:** in which the approach to solving the problem (experimental, practice based, analytic etc) is described in this part, leaving the justification to chapter three. **(iv) The Expectations and Outcomes:** here the expected contribution(s) to knowledge are concisely described. They are the things that may arise from the work that are new and may answer the question and bring new knowledge.

At the end of the introduction, a concise description of manuscript development and parts may be mentioned

- **Review of literature (30% of the body text):** it is a state of the art review which presents the results of a literature survey of the area(s) of study. It should be a critical review in the context of the stated research question and related issues. This chapter reviews what has been done in the topic, what is still being done, and what is still to do?. The literature survey is taken from published papers, research monographs, catalogues etc. It is to be expected that this chapter provides a new structured view of the field of study.
- **Methodology :** this is a key section that provides a description and justification of the research methods used. Normally, the methods will be selected from known and proven protocols. Details and modifications of protocols must be reported.
- **Results:** the collected results and data in previous section, whether qualitative, quantitative or mixed methods, are presented in this part. In this section, the raw results and analysis are presented. Typically, this section is simply a presentation and description of the data, not a discussion of the meaning of them. In other words, it is descriptive, rather than analytical. However, some universities will want you to combine Results with Discussion, that combine both presentation and interpretation of the data at the same time.
- **Discussion:** The collected and presented results are to interpreted and analyzed in this section. In other words, it consists to discuss what these results mean, especially in relation to the research question(s). The discussion will depend largely on the chosen methodology, the previous results reported in literature and the meaning of all these results together. Most importantly, student needs to discuss his results in relation to his research questions and aims, as well as the existing literature, what do the results tell about the research questions? Are they

aligned with the existing research or at odds? If so, why might this be?. The discussion must dig deep into the findings and explains what the findings suggest, what they bring as new, and how they may impact the field.

- **Conclusion:** In this section, the main conclusions are drawn. They must be consistent with the results obtained and must answer the main question posed at the beginning of the manuscript. Related conclusions must also be reported and justified.

The student should also report the implication of these conclusions (of his work) and the perspectives that can take off.

IV.3.3. References and Appendices:

- **References (required):** The reference list is very important and required part, it should contain a list of all resources used and cited in the dissertation/thesis. The student must keep the reference list up to date as he writes his thesis or dissertation. The references must be put in the in the required format of his university, or in one of the conventional agreed format, e.g. APA, Harvard, ...etc..

- **Appendices (optional):** these part contains additional items that the reader needs to see but do not need in the text (Supplementary data, figures, protocols...etc.), usually because they will interrupt the flow or take up too much space. If appendices are include, the student must ensure to refer to them where it is necessary in the main body of the dissertation.