Guideline for Writing the Main Text of a Thesis

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1. INTRODUCTION

This note describes how to organize the written thesis, which is the central element of your graduate degree. To know how to organize the thesis document, you first have to understand what graduate-level research is all about. In other words, this note should be helpful when you are just getting started in your graduate program as well as later when you start to write your thesis.

1.1. What is a Graduate Research?

The distinguishing mark of graduate research is an original contribution to knowledge. The thesis is a formal document, the main purpose of which is to prove that you have made an original contribution to knowledge. Your thesis must show two important things:

- you have identified a worthwhile problem or question, which has not been previously answered, and
- you have solved the problem or answered the question.

Your contribution to knowledge generally lies in your solution or answer.

1.2. What is a Graduate Thesis?

Because the purpose of the graduate thesis is to prove that you have made an original and useful contribution to knowledge, the examiners read your thesis to find the answers to the following questions:

- What is this student's research question?
- Is it a good question? (Has it been answered before? is it a useful question to work on?)
- Did the student convince me that the question he/she was dealing with was adequately answered?
- Has the student made an adequate contribution to knowledge?

To prove the originality and value of your contribution, you must present a thorough review of the existing literature on the subject, and on closely related subjects. Then, by making direct reference to your literature review, you must demonstrate that your question (a) has not been previously answered, and (b) is worth answering.

Describing how you answered the research question is usually easier to write about, since you have been intimately involved in the details over the course of your graduate work.

If your thesis does not provide adequate answers to the few questions listed above, you will likely be faced with a requirement for major revisions. For this reason, the **Guidelines for**

writing the Main Text of a Thesis given below is designed to highlight the answers to those questions with appropriate thesis organization and section titles. Always remember that a thesis is a formal document: every item must be in the appropriate place, and repetition of material in different places should be eliminated.

2. Writing the Main Text of a Thesis

The organization of the main text is bound to vary somewhat from thesis to thesis. Typically, the main text would be subdivided into the following chapters:

2.1. Introduction

This is a general introduction to what the thesis is all about. Briefly summarize the research problem or question (you will be stating the question in detail later), some of the reasons why it is a worthwhile question. Conclude with a statement of the objectives of the study.

2.2. Background Information (optional)

A brief section giving background information may be necessary, as your readers may not have any experience with some of the material needed to follow your thesis.

2.3. Literature Review (Review of the State of the Art)

Reading before you embark on the study will help you clarify areas that you should investigate and questions worth exploring. Gathering data first and then trying to read the literature will most likely be frustrating and a waste of time in the long run.

Ask the following questions:

- What are the main issues in my area of interest?
- What is known already?
- How much of what is known is relevant in my particular situation?
- In the light of what has already been written, in what ways is my study important, that is how will it add to what has been written already?

Allow plenty of time to review the literature. Having found relevant literature, you will probably find that selecting and rejecting material for review is painful. You will feel relieved when the review is written. However, once written, it should not be forgotten. Later you will need to discuss your results and reflect on how your findings complement or contradict the literature that you reviewed.

The literature review is the foundation of your study and forms the context for all you do!

The main idea behind literature review is to present (critical analysis comes a little bit later) the major ideas in the state of the art right up to, but not including, your own personal brilliant ideas. You organize this section by idea, and not by author or by publication. The majority of the references should be current, with the exception of historical, original work. Most sources should

be primary ones, representing the relevant work done in the field to date. They should be clearly relevant to the specific area of study. Sources whose theories or opinions conflict with yours should also be included. All information is to be appropriately cited as plagiarism is illegal.

2.4. Materials and Methods

If the experiments are thoroughly planned, gathering the data can be the most straightforward part of the thesis work. It is often the most interesting and enjoyable one! In this part of the thesis you describe your experiments in a way that they can be repeated by other researchers. This chapter may have one or several sections and subsections.

2.5. Results

This section includes analyses of the data and **presentation of results without interpreting or evaluating them**. Where you use tables and figures, they need to ben clear, concise, self-evident and well-labeled. The tables need to complement the text without repeating it. Statistical analysis should indicate the relationships between variables. Test statistics, level of significance, degrees of freedom and sample size need to be provided in brackets after each data analysis result.

2.6. Discussion

Before starting to write this section, you should ask yourself:

- What did I set out to investigate in the first place?
- What did I find out?
- What did I not find out?
- What extra information did I find out that is of interest?
- Are there any explanations for my discoveries?
- If I follow up on this study, what questions have been raised that would be interesting to pursue?
- How do the findings tie in with what I referred to in the literature review?

The discussion section should provide clear interpretation of your results in the context of what you planned to find out and previous research findings as outlined in section literature review. An important aspect will be a discussion on the appropriateness of your research methodology.

Here, you should get back to your hypotheses and revise whether you could answer what you had predicted in the first place. Does this agree with findings by others? If not, what could have been the reasons and has this been discussed elsewhere?

2.7. Conclusions

You generally cover three things in the Conclusion section and each of these usually merits a separate subsection:

- Conclusions on your findings
- Summary of Contributions
- Future Research

Conclusions are not a rambling summary of the thesis: they are short, concise statements of the inferences that you have made because of your work. It helps to organize these as short numbered paragraphs, ordered from most to least important. All conclusions should be directly related to your research question.

The **Summary of Contributions** will be much sought and carefully read by the examiners. Here you list the contributions of new knowledge that your thesis makes. Of course, the thesis itself must substantiate any claims made here. There is often some overlap with the Conclusions, but that's okay. Concise numbered paragraphs are again best. Organize from most to least important.

The **Future Research subsection** is included so that researchers picking up this work in future have the benefit of the ideas that you generated while you were working on the project.

2.8. General comments that will help the fluency of your writing

The first sentence of each paragraph should summarize what people will read in this paragraph. This is really difficult to fulfill for all paragraphs but try it out – readers can then follow what you want to say more rapidly and it gives your thesis a nice structure. Further, it also helps the structure and fluency of your writing if you have the same sub-headings throughout results and discussion (or even methods, results and discussion). Then readers can easily see how you discuss certain result points.

3. Thesis Style Guide

A thesis consists of three main parts: the preliminary pages, the main text, and the reference section. You determine the internal arrangement within the main text and reference parts. The following section specifies the organization and format that must be adhered to in preparing the final copy of your thesis.

3.1. Main Subdivisions of a Thesis

A thesis is normally subdivided into the following major sections:

3.1.1. Title Page

The title page contains, among others, the title of the thesis, the full name of the author or authors and the month and year of presentation.

3.1.2. Abstract

The abstract is the first and often the only section of your thesis that is read by most of the readers. Its content determines which other parts of the thesis will be looked at. Thus, be careful when writing this section. The abstract extracts the key points of your thesis, highlighting its purpose, methods, major findings and substantive conclusions. It does not include figures, tables or citations. The abstract page contains from top to bottom:

- The word ABSTRACT in bold uppercase letters in the top centre
- The text of the abstract as a single paragraph of not more than 250 words, in 1½ line spacing
- 3 to 6 keywords in bold uppercase letters

3.1.3. Author's declaration

A signed declaration by the author or authors regarding the originality of the work.

3.1.4. Dedications and acknowledgements

It is customary to at least acknowledge those who helped you in your thesis research, amongst them your supervisor and consultants.

3.1.5. Table of contents

The table of contents must, as a minimum, include all chapter headings and subheadings (up to 3 levels) and appendices. Where applicable, the table of contents should also include a list of tables, figures, accompanying materials, abbreviations and symbols, etc.

3.1.6. Main text

The main body of text and its accompanying figures and tables are your thesis work. As mentioned above, the main text would typically be subdivided into the following chapters: Introduction, Literature review, Material and Methods, Results, Discussion and Conclusions. Table and figures may be presented horizontally or vertically but, in either case, must fit within the required margins, and the placement of page numbers must be consistent throughout the entire manuscript. Each figure (or table) must have a legend, preceded by the figure (or table) number. The legends are placed above the tables and bellow the figures.

3.1.7. References

The list of references is closely tied to the review of the state of the art (Literature review). Most examiners scan your list of references looking for the important works in the field, so make sure they are listed and referred to in section Literature Review. All references given must be referred to in the main body of the thesis. Bibliographic references must be listed in alphabetical order by author's surname. Works by the same author should be listed in chronological order. More information about formatting bibliographic references is given in the section on Citations and References.

3.1.8. Appendices

What goes in the appendices? Any material which would be distracting in the main text, but which is important to justify the results of a thesis. Generally it is material that is either too detailed or not that central to the understanding of the research.

Examples include immense tables of data, program listings, detailed maps, etc.

3.2. Pagination

The title page is counted but should not be numbered. Numbering starts with the signature page in lower case Roman numerals. The rest of the thesis should be numbered in a single sequence in Arabic numerals (1,2,3,4 etc.) starting again with 1 on the first page of the main text. Illustrations, charts, diagrams etc., placed within the text of the thesis should be paginated as if they are pages of text. Page numbers should be in the upper right corner, midway between the top edge of the paper and the first line of text on the page.

3.3. Page Layout

The text and, wherever possible, all the material of the thesis, including illustrations, should be produced on A4-size paper and printed on one side only. Top, right and bottom margins should be 1 inch wide, while the left margin should be 1.3 inch wide to allow for binding.

3.4. Fonts

A sans-serif typeface (e.g. Arial) should be used for the thesis text. A serif typeface (e.g. Times Roman) may be used for headings and figure captions. Do NOT use script or fancy typefaces, and avoid mono spaced fonts (such as Courier). A 12pt font should be used for the main text, although a slightly larger point size (14pt or 16pt) may be used for headings and the title page. Headings may be in a **BOLD** font, but otherwise use **bold** and *italics* only sparingly, and try to avoid underlining altogether.

3.5. Paragraph formatting

One-and-a-half line spacing should be used throughout the thesis text, with the following exceptions which should be single-line spaced:

- The table of contents
- Tables
- Bibliography (although a blank line should be left between references)
- Footnotes and endnotes
- Long (blocked) quotations (typically longer than 40 words)
- Computer program listings/codes

It should be clear when a new paragraph is starting by leaving extra space between paragraphs (you can use the paragraph formatting features of your word processor to do this automatically).

3.6. Numbering

Arabic numerals should normally be used for numbering all sequences within a thesis, with the exception of page numbers in the front matter as noted above. To avoid excessive nesting depth, not more than 3 levels of headings should be used, with chapter headings being at level 1 and numbered sequentially as **1**, **2**, **3** etc.

Level 2 headings (subheadings) should be numbered as **1.1**, **1.2**, **1.3** etc. while level 3 headings should be numbered as **1.1.1**, **1.1.2**, **1.1.3** etc. If more than one appendix is included, these should be numbered separately as **Appendix 1**, **Appendix 2** etc.

Figures should be numbered consecutively in a single sequence **Figure 1**, **Figure 2** etc., generally without distinguishing between different kinds of figures. Tables within the text should be numbered consecutively in a single sequence **Table 1**, **Table 2**, etc.

3.7. Citations and References

Why do you have to cite other authors?

This information is taken from the "Guidelines for Citation in Scientific Texts", Study Materials for the M.Sc. Programme Organic Agriculture and Food Systems compiled by Dr. S. Zikeli:

"As you do research you must collect and read other papers and books on your topic. It is very important for you to get a thorough insight in the field you are working on. Otherwise it is impossible for you to relate it to what has been done before. When you are writing your thesis, your research paper or your project report you have to refer to works of other authors. It is not possible to just to postulate your ideas without backing them up with scientific evidence produced and published by other authors. The comparison and the critical discussion of other scientist's results and ideas is the center of each scientific work. It is very important to acknowledge the source of your information. If you are not doing this properly, you can be accused of plagiarism. Plagiarism is defined as presenting someone else's work as one's own (Merriam- Webster, 1993). Besides the moral aspect of dishonesty and fraud you have to consider that the consequences of plagiarism, even for you as a student, are severe. In case you are discovered you will fail your course assignment or your M.Sc. thesis. This happens also in case you include ('copy and paste') parts of electronic publications or texts from web pages in your work without citing the source.

Moreover, student plagiarism affects the role of your teachers: They are not supposed to be detectives checking for passages copied from the internet in your thesis but to be mentors and supervisors on the content of your scientific work. And finally, you are wasting a chance for yourself: To learn how to write a scientific text including its presentation – something which is required nowadays very often no matter which profession you finally choose."

3.7.1. List of References

This section is a reference indication of the main types of documents that need to be quoted from or referred to in your work and that therefore need to be properly cited and listed in your thesis. The word **document** is used here to mean any information carrying item (book, periodical, thesis, electronic source, etc.) that may be used in academic work and that needs to be quoted from or otherwise used in your thesis and that, consequently, needs to be correctly identified and entered in a list of references. It is essential in serious academic undertakings to properly document your work using the style of one system only. Once a style has been adopted no mixing of styles is permitted, and consistency is, therefore, paramount.

You should format the reference section using the following style:

A book with two authors:

Parker, C. and Riches, C.R., 1993. Parasitic weeds of the world: Biology and control. CAB International, Wallingford, United Kingdom, 332 pp.

A book with three or more authors:

Penning de Vries, F.W.T., Jansen, D.M., ten Berge, H.F.M. and Bakema, A., 1989. Simulation of ecophysiological processes of growth in several annual crops. Pudoc Wageningen, the Netherlands, 271 pp.

An edited book:

Rabbinge, R., Ward, S.A. and van Laar, H.H. (Editors), 1989: Simulation and Systems Management in Crop Protection. Simulation Monographs 32, Pudoc, Wageningen, the Netherlands, 420 pp.

A chapter in, or a selection from, a book or proceedings:

Riches, C.R. and Parker, C., 1995. Parasitic plants as weeds. In: M.C. Press and J.D. Graves (Editors), Parasitic plants. Chapman & Hall, London, UK, pp 226-255.

A corporate author:

A corporate author can be an organisation, a body, an association, etc., but not usually a person.

FAO, 1996. Food and Agriculture Organization of the United Nations, Production 11 yearbook (46). FAO, Rome, Italy.

Dissertations and Theses:

Herz, P., 1995. Stoffproduktion und Trockenmasseverteilung der Ackerbohne (*Vicia faba* L.) unter wasserlimitierten Bedingungen. Dissertation, Universität Hohenheim, 143 pp. 10

Journal article:

Kropff, M.J. and Lotz, L.A.P., 1992. Systems Approaches to Quantify Crop-Weed Interactions and their Application in Weed Management. Agricultural Systems, 40: 265-282.

Stützel, H., 1995. A simple model for simulation of growth and development in faba beans (*Vicia faba* L.), 1. Model description. European Journal of Agronomy 4(2), 175- 185.

Note that the issue number is given in parentheses.

Electronic Sources:

CD-ROM

FAO-Agrometeorology Group, 2000. World-Wide Agroclimatic Database [CD-ROM]. FAO, Rome, Italy.

Follow the title with the type of medium, in this case CD-ROM, in square brackets.

Computer Program, Software, or Programming Language

ModelKinetix.com, 2001. ModelMaker 4 [Computer software], The Magdalen Centre, Oxford Science Park, Oxford, UK.

Internet Source

Altieri, M.A., 2000. Multifunctional Dimensions of Ecologically-based Agriculture in Latin America[On-line]. Available: http://www.cnr.berkeley.edu/~agroeco3/multifunctional_dimensions.html. Access date: 2.11.2011 [when you visited and downloaded the website]

The type of medium for all online sources is given in square brackets as Online. This is then followed by the path leading to the document or information stored electronically, in this case the URL, or Uniform Resource Locator, of the website cited.

3.7.2. Citations in the Text

This information is taken from the "Guidelines for Citation in Scientific Texts", Study Materials for the M.Sc. Programme Organic Agriculture and Food Systems compiled by Dr. S. Zikeli:

"There are several ways to cite an author in the text. You can either paraphrase or sum up with your own words what the author is saying or you can quote him or her directly. Note: As soon as you are using parts of the author's original sentences, you have to use quotation marks to make clear that the following words are a quotation.

Example

Quotation: Many species in forest hotspots are endangered and "in a nightmare scenario, battalions of loggers armed with bulldozers and chainsaws could wipe these habitats off the face of the Earth in a few months – and with them large parts of the world's biodiversity" (Wilson, 2002).

Paraphrasing and summing up in your own words: Many forest hotspots are endangered by logging activities which induce a serious threat on the earth's species diversity (Wilson, 2002).

You can as well cite the author and the year of the publication at the end of the sentence or use the name of the author as a part of the sentence.

Example

Citation as a part of the sentence: Wilson (2002) considers logging activities in forest hotspots as a serious threat to the earth's species diversity.

Citation in the end of the sentence: Logging activities are considered to be a serious threat to species diversity in forest hotspots (Wilson, 2002).

If one of the authors or group of authors you're citing published more than one article in one year, the journal articles are usually distinguished by adding a letter: Smith (2005a); Smith (2005b)

If an article or a book was written by more than two authors, you are either requested to list them all or to use the abbreviation "et al." (et alii, Latin for "and others"): Smith, Jones and Hansen (2004) or Smith et al. (2004).

If you are citing more than one author, you can either arrange the names in an order related to the date of publication of the articles or books of the different authors or in an alphabetical order, e.g.: (Rhoades 1982, Stork 1985, Zschach 1978) or (Zschach 1978, Rhoades 1982, Stork 1985)."

4. Getting Started

The best way to get started on your thesis is to prepare an extended outline. You begin by making up the Table of Contents, listing each section and subsection that you propose to include. For each section and subsection, write a brief point-form description of the contents of that section. The entire outline might be 2 to 5 pages long. Now you and your thesis supervisor should carefully review this outline: is there unnecessary material (i.e. not directly related to the problem statement)? Then remove. Is there missing material? Then add. It is much less painful and more time efficient to make such decisions early, during the outline phase, rather than after you've already done a lot of writing which has to be thrown away.

4.1. How long does it take to write a Thesis?

Longer than you think! It's not the physical act of typing that takes so long, it's the fact that writing the thesis requires the complete organization of your arguments and results. It's during this formalization of your results into a well-organized thesis document capable of withstanding the scrutiny of expert examiners that you discover weaknesses. It's fixing those weaknesses that take time. This is also probably the first time that your supervisor has seen the formal expression of concepts that may have been approved previously in an informal manner. Now is when you discover any misunderstandings or shortcomings in the informal agreements.

4.2. Tips

Always keep the reader's backgrounds in mind. Who is your audience? How much can you reasonably expect them to know about the subject before picking up your thesis? Usually they are pretty knowledgeable about the general problem, but they haven't been intimately involved with the details like you have: spell difficult new concepts out clearly. It sometimes helps to mentally picture a real person that you know who has the appropriate background, and to imagine that you are explaining your ideas directly to that person. Don't make the readers work too hard! This is fundamentally important. Choose section titles and wordings to clearly give them this information. The harder they have to work to ferret out your problem, your defense of the problem, your answer to the problem, your conclusions and contributions, the worse mood they will be in, and the more likely that your thesis will need major revisions. Remember that a thesis is not a story: it usually doesn't follow the chronology of things that you tried. It's a formal document designed to answer only a few major questions.