

Organizing and Writing Your Thesis

Some Tips

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Outline

- General aspects and philosophy
- Organization
 - of the whole thesis
 - Within the thesis
- Writing style and form
- Getting started, keeping going
 - (personal advice from writers)
- Resources

General philosophy: Hierarchy of importance

- Content
 - the message given
- Style
 - the way that message is presented (structure, language, and illustration)
- Form
 - the appearance of the message (grammar, punctuation, usage, spelling, and format).

A thesis is an original contribution to knowledge

- A reader will expect that:
 - you have identified a worthwhile problem or question which has not been previously answered
 - you have solved the problem or answered the question.

A thesis is an attempt to persuade

- A reader/reviewer will ask:
 - what is the research question?
 - is it a good question? (has it been answered before? is it a useful question to work on?)
 - did the author convince me that the question was adequately answered?
 - has the author made an adequate contribution to knowledge?

Style and structure

- Organization
- Emphasis
- Depth
- Transitions between sections

Organization: the key to persuasion

- Start by writing down the single most important concept.
- Outline the critical observations and reasoning that support that concept
- Test the organization by careful evaluation of the outline
- Expand the outline to greater detail, then test it again
- Write the body of the text : methods first, observations next, interpretations last.
- Write the contextual elements: conclusion first, introduction next, abstract last.
- Insert carefully composed transitional sections, paragraphs, and sentences.

Organization of the thesis

- Abstract
 - Introduction
 - Background and Literature review
 - Problem statement/research question
 - Methods
 - Data presentation
 - Interpretation
 - Discussion
 - Conclusions
 - References
- **Different types of writing might have more/less emphasis on each of these elements

Abstract

- Write this LAST!
- Abstracts should be 1-2 pages and should be self-contained
- Model after a paper in your field
- Written to attract readers to your thesis, gives a good initial impression
- Summary of the contents of the thesis
- Brief but contains sufficient details
 - motivation for the work (problem statement)
 - project objectives
 - techniques employed
 - main results and conclusions

Introduction

- Write this second to last!
- This is a *general* introduction to what the thesis is all about -- it is *not* just a description of the contents of each section.
- Briefly *summarize* the question (you will be stating the question in detail later), some of the reasons why it is a worthwhile question, and perhaps give a brief overview of your main results.

Introduction

- Topic?
 - Defines scope and limitations of study
- Importance?
- Background?
- Arrangement of thesis?
- Look at examples in published literature in your field
- This section is likely to contain a lot of reference citations--put your thesis in context of existing work

Background

- A brief section giving background information may be necessary.
- Your readers may not have any experience with some of the materials needed to follow your thesis, so you need to give it to them.
- A more informative title will usually help

Review of the State of the Art (Literature review)

- Limited to the state of the art *relevant to your thesis*. Again, a specific heading is appropriate; e.g., "Previous work on Fabrication of Light Weight Concrete." The idea is to *present* (not analyze) 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.
- Some advisors think this section should come after the problem statement (next section)
- Some advisors do not expect a long lit. review for the thesis - be sure you ask your supervisor!

Literature review

- Provides context for and details about the motivation for the project
- States why the problem is important
- Sets the scene for the work described in the thesis
- Describes what others have done and hence sets a benchmark for the current project
- Justifies the use of specific techniques or problem solving procedures

Tips for literature review

- Make it a point to keep on top of your field of study by making regular visits to the library and to the electronic journals websites.
- When reading a technical paper, jot down the key points and make a note of the journal or technical publication where the paper was published.
- Devise a cataloguing system that will allow you to retrieve the paper quickly.

Tips for literature review

- Make sure that you have read and understood cited work
- Organize your content according to ideas instead of individual publications.
- Do not simply quote or paraphrase the contents of published articles. Weave the information into focused views. Demonstrate your deeper understanding of the topic.
- Do not be tempted to summarize everything you have read; only include those relevant to your main points.

Research Question or Problem Statement

1. A concise statement of the question that your thesis tackles
2. Justification, by direct reference to previous work, that your question is previously unanswered. This is where you *analyze* the information which you presented in the “state of the art” section
3. Discussion of why it is worthwhile to answer this question.
4. Highlight the section with a heading using words such as “problem” or “question”

Data and interpretation

- No standard form. But still organized!
- One or several sections and subsections.
- Methods, Data, Interpretation sections are separate
- Only one purpose: to convince the reader/reviewer that you answered the question or solved the problem stated in the previous section.

Data and Interpretation

- Present data that is *relevant* to answering the question or solving the problem:
 - if there were blind alleys and dead ends, do *not* include these, unless specifically relevant to the demonstration that you answered the thesis question.
 - Note for some theses it may be important to include these in an appendix

Methods

- Depending on your topic this may be one paragraph or a long section
- If measurement error is important to your study, state how this was assessed.

Data presentation

- Draft your figures first: (A picture is worth a thousand words)
- Make captions stand alone
- Use enough figures to present the data that justifies your interpretations and conclusions. No more, no less. (Don't use 1000 words when 500 will do)
- Write your text around your figures

Use the proper tools (for your research AND your writing)

- Spreadsheets, analysis tools
- Plotting programs
- Graphics programs
- ENDNOTE
- Writing resources

Focus on one important thing in each paragraph

Each paragraph needs a topic sentence

Contents of paragraph should only relate to that topic

Interpretation

- Keep separate from data, clearly distinguished by paragraph, section, and/or words like "are interpreted to show".
- Depending on your topic, it is often useful to subdivide interpretation into a "local" or small scale (directly flows from your data) and a "regional" or "big picture" scale, that flows from consideration of your data with that of others. This latter type is usually included in the "discussion" section.

Discussion

- Look at discussion sections in papers in your field. See what they cover.
- Usually is a broader scale interpretation than just your data (relate to previous published results)
- Addresses the bigger problems of your research topic and how your study fits into solving those problems
- Is NOT a conclusion section

Conclusions

- 1. Conclusions
- 2. Summary of Contributions
- 3. 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 the research question stated

References

- All references cited, including those in Tables and Figure captions. No more, no less.
- Use consistent style throughout (e.g. “et al.” OR “and others”, not both)

A few words on form

- Format: Typography, layout
 - Follow the Grad. School guidelines for a thesis, journal guidelines for a paper
 - Plan ahead! (e.g. do you really need 50 *color* figures?)
- Mechanics:
 - Grammar
 - Usage
 - Punctuation
 - Spelling