Learning Development | Student Services

Learning objectives

This module will help you to:

- learn about various research models.
- prepare a research proposal.
- structure your thesis and its chapters.
- write convincingly of your research outcomes and implications

University of Wollongong

Research and Thesis writing

3. Thesis structure guidelines

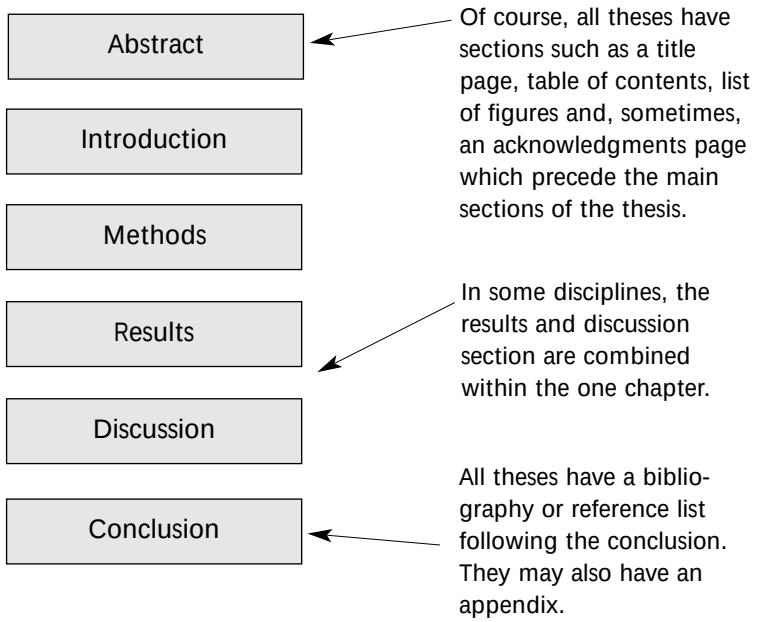
This unit outlines and discusses the structure of a research thesis. There is no one right way to structure a thesis; instead, the structure will be influenced by the discipline you are working within, the questions you pose, the methodology and theoretical frameworks you use, and the issues you want to cover. This unit will outline two common thesis structures and the internal structure of the chapters or sections of a thesis.

Common thesis structures

There are two broad categories of thesis structure which you might want to use or adapt to create your own structure.

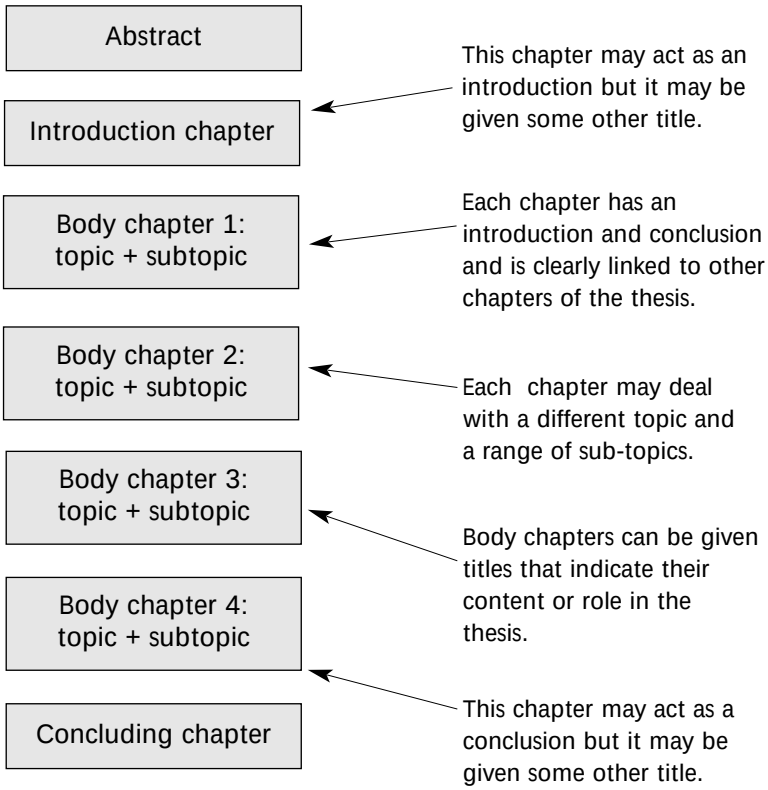
Type 1 – structure

Type I is traditionally used in Science disciplines but is not restricted to these disciplines: it is used to report on research which is experimental in nature. The thesis is organised into the follow chapters:



Type 2 – structure

This structure may be useful for theses in Nursing, Humanities, Creative Arts, Education, especially those that are theoretically-based rather than experimental and not suitable for the typical Science thesis of 'methods, results, discussion' chapters.



Each chapter in the above diagram will include its own introductory section, definitions of terms as well as its own conclusion. Each will also have its own literature review related to the issue, although a slight variation on this pattern is to place all literature review material into one chapter immediately after the introductory chapter.

To make sure that you gain a wider understanding of a possible structures for your thesis, you might:

- look at successful theses that have been produced within your discipline,
- talk with your supervisor,
- look at theses that have used similar research designs or models or methodologies to the ones you want to use, whatever discipline they might be from.

Remember that theses of all types have a title page, a table of contents and a bibliography or reference list. Where necessary, a thesis also has a list of figures, tables or diagrams. An acknowledgments page is not essential but is also a common inclusion in theses of all types. For more information about these more formal parts of a thesis, see your faculty for information or look at examples of other theses in your discipline. In the following section, we look at the function of each of the sections of the thesis.

Abstracts

The **abstract** section of the thesis should provide a complete outline of the thesis and would normally do this within one to two pages of double spaced text. It tells the reader:

- **WHAT** the research is about.
- **WHAT** question the research is answering or what gap in previous research the present research fills.

- **WHY** the research was done ie the purpose or aims of the research
- **HOW** the research was done ie the methodology that was used.
- **WHAT** the research found ie the results
- **SO WHAT**, tells why the results are significant and what the implications are/may be.

Because its function is to provide an outline of the whole thesis, notice that it's one section that you can only finalise after you have completed writing up the rest of your thesis.

In some qualitative theses, the abstract might also include a statement of the writer's perspective in regard to the research. This broadly still fits within the **HOW** (methodology) stage of the abstract. An example of this is the following short statement which appeared in the abstract of a Masters of Nursing Honours thesis:

> "… In this research, I use a post-structuralist feminist perspective incorporating Foucault's ideas on power, knowledge, truth and resistance …"

You may notice that the writer has used the personal "I" in her writing. This is still relatively unusual, but here the perspective that the writer is using (post-structuralist feminist) is one which acknowledges the subjective and challenges the idea that any knowledge is objective. Given this, it is not surprising that the writer chose to use "I". In more traditionally oriented thesis, you are more likely to find more impersonal language eg. "This research makes use of x approach to …"

Language: Verb tense choices in Abstracts

Tense choice in abstracts varies depending on whether results are being presented or the implications of the research are being discussed. Notice in the following text

The yellow-bellied glider Petaurus australis) **is** one of only a few mammal species that feed on plant and insect exudates. The research described in this thesis ***aimed*** to assess the importance of the diet on the behavioural ecology of the yellow-bellied glider. Gliders ***were studied*** in detail at two sites in New South Wales in quite different forest habitats …	*Present tense is used in the first sentence and the past tense used in following sentences that talk about what 'happened'*
This study **shows** that the extensive use of exudates by yellow-bellied gliders has a strong influence on their behavioural ecology. Exudates **display** a set of traits (a clumped spatial distribution, a continuous rate of renewal, can **be** quickly digested, **have** the potential to be available year-round and to be at times superabundant) which **produce** (i) an uncommon time-activity budget, (ii) a flexible mating system and (iii) apparent territoriality …	*Only present tense is used in this section when talking about how things currently are.*

For example Abstracts from Engineering, Biology and Commerce, see the Unit 3.1.

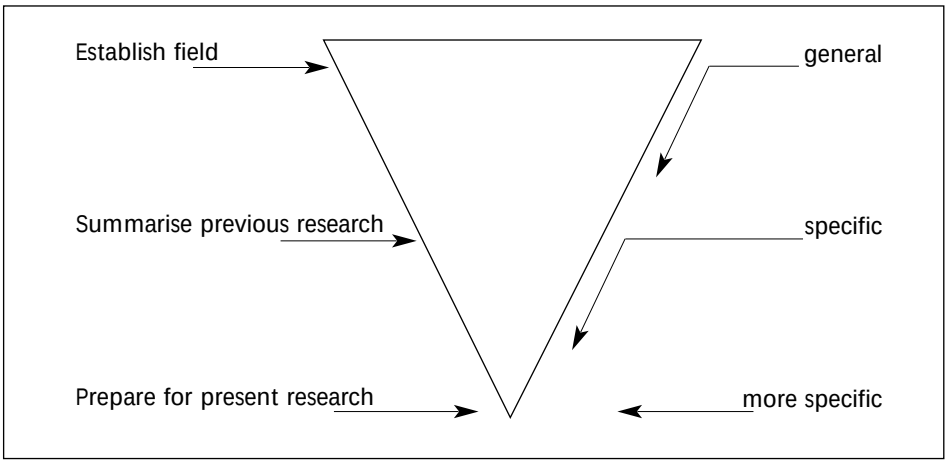
Introductory Chapters

The overarching purpose of an introductory chapter is to introduce your research and your thesis; however, the scope of the introduction can vary significantly according to the nature of your study and your discipline area. Here we look only at the function and staging of the introductory chapter or section for the WHOLE thesis. You will find further information on the introductory sections for body chapters in a later section of this module which examines body chapters .

Traditionally the introductory chapter functions to introduce the research in detail and establish the validity of the research by showing that the previous research in the field contains a 'gap' in knowledge that will be filled by your research. The stages within an introduction function to:

- establish the field of your research
- summarise or review the previous research in the field
- prepare for your research by showing a gap in the previous research or raising questions based on, or prompted by, previous research
- introduce your research in detail and state the purpose or aim of your research
- outline the whole thesis.

These stages are not necessarily discrete sections but are movements within the text that provide a logical progression of information from the general to the specific (see these movements exemplified in the example introductions in Unit 3.2 – Sample Introductions from Biology, Engineering & Education). These movements in the text introduce the reader to the general field, then summarise relevant previous research in a specific field in a way that allows the gap in the field to be identified. This gap prepares for and provides a rationale for the research presented in the thesis. These movements can be represented by the following diagram:



In identifying where a gap in knowledge exists, you are showing that the research story so far in this area is not yet complete and that your thesis is going to help fill out the story further. Alternatively, preparing for the present research might mean highlighting the fact that there are differing perspectives on an issue that your thesis is going to explore and clarify.

Not all introductions will fulfill all of the functions suggested above; for example, some disciplines will typically include an outline of the thesis in the introduction, while others may not. There is also variation between disciplines in relation to where the summary of previous research (the literature review) sits. It may be either inside and towards the end of the Introduction or exist as a separate chapter (eg in Engineering). Occasionally, a literature review section may be needed (especially in type 2 theses) in each chapter to provide a summary of previous research related to the particular topic under discussion in each chapter. Use the stages listed above as a checklist when talking with your supervisor and when looking at other theses that have been produced in your discipline or that use the research methodology you've chosen. If not all of these functions are included, talk with your supervisor about why this might be so.

For example Introductions from Biology, Engineering and Education, see Unit 3.2.

Methods chapters (in Type 1 structures)

The methods chapter tells your reader 'how' you carried out the research that was needed to answer your research questions. In the traditional thesis structure it may take up a whole chapter. The Methods sections/chapter functions to explain:

- **WHEN** the study was carried out
- **WHERE** the study was carried out
- **WHAT** materials, techniques, samples, data, approaches, theoretical frameworks were used in the study, and
- **HOW** the study was carried out , or
- **WHAT** procedures were used.

These last two points might include issues such as the statistics that were used to analyse data.

The methods section is very important in Science and Engineering disciplines. In these disciplines, detailed description of the methods used in the research allows the research to be replicated by other researchers. The detailed description presented in some theses of the trial and error of particular methodologies used in the research design also provides the rationale for the final choice of methodology or method of experimentation. If the methodology is cumulative, ie does build up through trial and error to a final methodology, then you may also find some discussion of the problems encountered in earlier methodologies within the section/chapter dealing with methodology. If, however, the methodology is relatively straightforward with few deviations from the original design, any problems encountered using your chosen methodology will be discussed in the Discussion section/chapter.

In a thesis structure where the methodology is less important, ie where it is not critical for the whole thesis that the research is reproducible, for example in a type 2 structure, a description of the methodology used might sit as a small section in the introduction (see the Education Introduction in 3.3 for an example of such a methodology section).

Language: Verb tense choices in Methodology sections/chapters

The methodology chapter is usually written using *past tense*, eg "data ***were examined ...***" The reason for this is that the data examination was carried out **before** it was written up in the thesis. Notice that is written in the passive voice as well: this is used so that focus falls on *what* was examined and not on *who* did the examining.

For example Methods sections from Biology, Engineering and Education, see Unit 3.3.

Results, Discussion and Conclusion chapters

The results, discussion and conclusion sections of a thesis may appear as separate chapters or may be combined in different ways. Three models below show different combinations.

<table>
<tr><th>Model 1</th><th>Model 2</th><th>Model 3</th></tr>
<tr><td>Results</td><td rowspan="2">Results
&
Discussion</td><td>Results</td></tr>
<tr><td>Discussion</td><td rowspan="2">Discussion
&
Conclusion</td></tr>
<tr><td>Conclusion</td><td>Conclusion</td></tr>
</table>

These models are taken from Murrison, E ,& Webb, C. (1991*) Writing a research paper*. From the series :Writing Practice for University Students

You may also have mini results, discussion and conclusion sections occurring within chapters if there is no separate results section or chapter.

Results chapters (in Type 1 structures)

This is the chapter/section that tells your reader **what** you found, or what the results of your research were. The results are normally written up using complete paragraphs but are often supported by tables and/or graphs. The choices you make about how to present your results depend on the conventions used in your discipline, what you were trying to find, and the methodology you used.

Results sections should be organised so that they reflect:

- the methods outlined in the methodology chapter, and the sequence of information presented in the methods section; and
- the aims or research question/s outlined in the Introduction.

They should build on what readers already understand of your research. Results sections should present only the results/ findings and should not include interpretations of the results. Interpretation belongs only in a discussion section.

Results sections can, in some disciplines, be combined with discussion in a 'Results and Discussion' chapter/section. This is often the case in disciplines such as Engineering and Education. In combined sections, the presentation of results and the discussion of those results should occur in different sub-sections.

Language: Verb tense choices in results sections

The results chapter or section of your thesis typically uses past tense verbs, for example: "The sap of E. viminalis *accounted* for 94% of the feeding observation time …"

Occasionally, however, present tense is used when describing a table or graph or figure eg : "Table 1 **gives** the number of days that the subjects used the drug", or when comparing results eg "the data obtained in study 1 **show** differences in size when compared with study 2".

For example Results sections from Biology, Education & Nursing, see Unit 3.4.

Discussion chapters (in Type 1 structures)

The function of a discussion section is to:

- interpret the results presented in the results section; and
- discuss them in relation to your research question and to the results of previous research in the field.

Of course, to present any discussion about results from previous research, you must already have introduced this research in your literature review. Discussion chapters also often include sub-sections on issues arising from the study, or that detail the implications of the research.

Language: Verb tense choices in discussion sections

Discussion sections or chapters use a range of tenses depending on whether results are being discussed, or whether claims or generalisations based on the results are being made. Notice the changes in tense in the following example from a Biology thesis: present tense is used when making statements about how things *are*, while past tense is used when making statements about what *was* found.

present tense

Eucalypt sap, honeydew and manna **consist** mainly of various sugars and contain little or no protein (Basden 1965, 1966, Paton 1982, Stewart et al. 1973); therefore, yellow-bellied gliders must **harvest** arthropods or pollen to meet their protein requirements. At Bombala, gliders **harvest** arthropods principally by peeling back loose shedding bark or by searching through hanging bark ribbons which persist on the trunk and branches of E. viminalis. ... For the present study, the harvesting of arthropods *accounted* for 23% of the total feeding observation time. ... The low rates of renewal of arthropods (Smith 1982a, Henry 1985) probably **requires** that gliders must **forage** over large distances to meet their protein needs. At Bombala, gliders often *harvested* arthropods when gliding to major resource trees such as sap-site trees and manna trees. This is similar to the behaviour of some frugivorous primates which **supplement** their diet with arthropods harvested whilst moving between fruiting trees (Terborgh 1983).

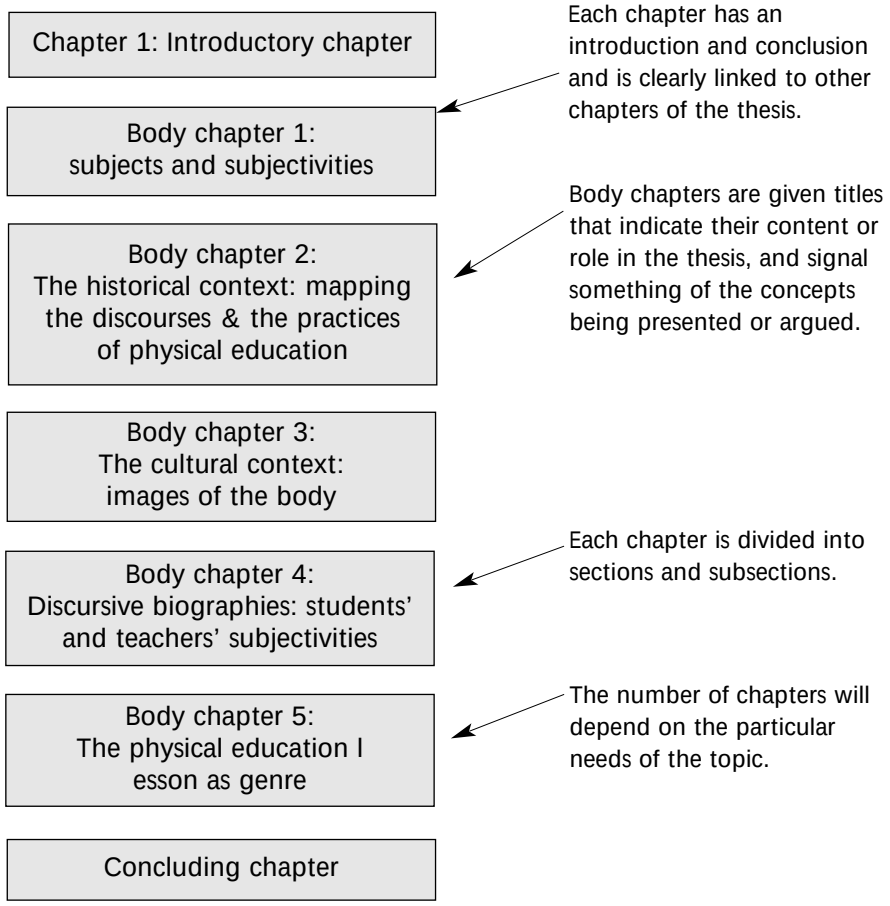
past tense

For example Discussion sections from Biology, see Unit 3.5.

Body chapters (in Type 2 structures)

In theses with a Type 2 structure, unlike Type 1 structures, the chapters between the introduction and the conclusion do not have a predetermined, logical structure to follow: that logical structure must be imposed on the topics or issues that constitute the thesis. Mapping that structure in the early stages of writing is very important and helps the writer to see the thesis taking shape while the logical structure of the finished thesis is crucial if the thesis is to pass through the examination process successfully.

The following thesis outline is from a Type 2 thesis.



Structure also needs to be imposed on the presentation of information within chapters. The main way this is achieved is by the division of information into sections and subsections in a way that allows readers to see the relationships between different topics and subtopics. Because there is an organisational hierarchy here or a nesting of bits of information inside other bits of information, some kind of numbering system is needed to make the hierarchy apparent to the reader. Notice how the table of contents excerpt below allows readers to see how bits of information inside the chapter relate to other bits of information. Also notice how the titles of chapter, sections and subsections begin the process of presenting the argument to the reader: seeing a chapter outlined in this way gives the reader a 'big picture' understanding of what concepts the chapter is dealing with and what arguments are being presented.

Chapter 3 The historical context: mapping the discourses and the practices of physical education

Notice how descriptive the chapter title is.

3.1 Introduction

Notice the existence of an introduction to the chapter. Chapter introductions function to introduce previous research or to outline how that particular chapter will unfold.

3.2 The British experience
- 3.2.1 Boys' physical education drill and games
- 3.2.2 The female tradition in physical tradition

3.3 The Australian experience

Notice how the titles of the major sections of the chapter relate clearly to the chapter title. Also notice how the same can be said of the subsections inside each section.

- 3.3.1 Drill and games – 1880 – 1930s
- 3.3.2 The female tradition in NSW to 1960
- 3.3.3 The male tradition in NSW to 1960

3.4 The masculine tradition as the tradition with sports and games as its focus

3.5 State of the art: the 1980/5 Syllabus in New South Wales

3.6 Conclusion: Physical education, sport and social control

Notice the existence of a conclusion. Also notice the way in which the title indicates something of the writer's argument on this topic.

Structure within the sections and subsections of the thesis is also important for providing the reader/examiner with an easy-to-read thesis. Some of these issues involve the structure of paragraphs, the use of cohesive devices to ensure that your sections 'hang together' well and the creation of logical flow within and between paragraphs. For information about these issues, see the module *Cohesive Writing*.

Conclusion chapters (Type 1 & Type 2 structures)

The conclusion might begin by reiterating

- the aims of the research
- the results of the research
- the implications of the results.

Its main function, though, is to:

- make generalisations arising from the discussion of the results
- look at the implications of the findings for practice, accepted theoretical models/paradigms and indicate the overall importance of the research to the field
- in some theses, make recommendations for future practice, or future research.

In some thesis types, especially type 2 theses, the conclusion is the place where all the strands of the thesis are finally pulled together and a thesis is presented. In such cases, the chapter may have a title other than 'Conclusion' even though it plays a concluding role.

For example conclusions from Education and Engineering, see Unit 3.6.

References

Murison, E ,& Webb, C. (1991*) Writing a research paper*. From the series: Writing Practice for University Students, Learning Assistance Centre, University of Sydney.