

Graduate Education Thesis/Dissertation Writing Workshop 2012

How to write your
thesis or dissertation

Who is responsible for your Education?

YOU

- People and entities that will help:
 - Your advisor
 - Your committee
 - Your department
 - The Office of Graduate Education

Your Thesis or Dissertation is a Book.

- Writing a book usually takes roughly a year.
- But you have some advantages:
 - You have been working on the ideas, methods, results and conclusions for at least one or more years,
 - You have well-documented information on all of the above, because you have carefully recorded this in a notebook,
 - You have an advisor that is reading the book as it is written and providing useful feedback,
 - Major parts of your thesis/dissertation were succinctly outlined and defended before your committee.
- Realistically, most students need at least one semester to write the thesis or dissertation.

What is the Sequence of Events? (Ph.D.)

- First Year:
 - Taking foundational courses,
 - Putting a Program of Study in place,
 - Passing the Qualifying exam
- Second Year onward:
 - More specialized courses,
 - Passing the Comprehensive Exam (includes dissertation proposal),
 - Admission to Doctoral Candidacy,
 - Conducting the research,
 - Writing the dissertation,
 - Defending the dissertation (this is truly the final exam),
 - Editing and depositing the dissertation,
 - Graduation.

A Thesis or Dissertation Starts with a Problem

- Early after you pass the Qualifying Exam, you must work with an advisor to define a problem that you are going to address, such as:
 - Tests of a Hypothesis,
 - Development of a Theory,
 - Characterization of a Phenomena,
 - Etc.
- Example: “Pigs Really do Fly (when people are not watching).”

Once the problem is defined...

- One conducts an in-depth literature search which may modestly or dramatically alter the problem (because someone may have already studied the problem)
- Refine, with your advisor and committee, the problem that you will solve:
 - Example: “Only BABY Pigs Really do Fly (when people are not watching).”

Now write the Proposal, as part of the Comprehensive Exam

- The proposal, like any proposal, must
 - define the problem,
 - document the literature and research that has been done, to date,
 - address how you are going to solve the problem,
 - show preliminary data, if any,
 - address alternatives, if your proposed methods to solve the problem do not work,
 - list objectives and “deliverables” that, when complete, indicate completion of the project and the beginning of writing of the dissertation.

Once you have passed the Comprehensive Exam and Dissertation Proposal....

- Under the guidance of your advisor, conduct the research,
- AND carefully document everything enroute to the completion of the project:
 - Pictures, drawings and figures,
 - Experimental details, dates, equipment,
 - Data: “good” or “bad”, ALL OF IT,
- All in rugged, low-acid, well-bound logbooks (in ADDITION to electronic records that you produce) because this will serve as your permanent record, from which you will draw all the relevant facts and figures as you write your dissertation. If your research (and any publications or inventions thereof) is ever contested by another, this record is what you will need to defend your work.

Note that the order of presentation of chapters in the dissertation or thesis is often NOT the order in which they are written.

For a generic example, a dissertation in physics might have the following chapters which could be written in a completely different order. Please consult with your advisor or committee for specific guidance to your dissertation or thesis.

Order of presentation	Order in which chapters are written
Introduction	Introduction
Theory	Methods
Methods	Results or Theory
Results	Results or Theory
Conclusions	Conclusions
References	References
Appendices	Appendices

First Write the Introductory Chapter...

- Include the definition of the problem,
- Why the problem is interesting and important (ex. - flying baby pigs raises all kinds of concerns about aerospace safety in the vicinity of farms)
- What research has been done prior to your work (i.e. – the literature search),
- What you did (qualitatively),
- What kinds of results this dissertation will present.

Next write the Methods Chapter...

- This is what you did and how you did it,
- This should be the easiest part to write and, though students often do not appreciate it, this is often the most important part because the long-term impact of much of research lies in the methods that were developed.
- Experimental/Theoretical details of all kinds belong here:
 - Equipment,
 - Computations,
 - Measurements,
 - Technical drawings, pictures, etc.,
 - Enough detail to allow others to reproduce the research,
 - And adequate references so that readers can glean what parts of your methods come from others.

Sometimes there is a “Theory” Chapter

- To address the complexity of the problem at hand,
- And this may be written either before or after the Methods Chapter.
 - Often the Theory Chapter has an extensive, additional literature review.

Now the Results Chapter...

- This is where YOUR data is clearly separated from the work of others and, possibly, compared to the work of others,
- The greatest difficulty with this chapter often lies in the data presentation – how to properly present the data that highlights the significant aspects of your data, while not hiding those parts of the data that you view as less significant,
- FULL DISCLOSURE – censor nothing!
- But supporting appendices may be used if your data is too extensive.

Followed by the Conclusions....

- This is where YOU extract all that you can from your data, and no more than that,
- This is also where you discuss the broader significance of your research,
- And, lastly, this is where you chart a path forward. What direction should the follow-up research follow, were you to continue to conduct research in this area?

Lastly....

- Then come the iterations between you and your advisor, often many iterations.
- When the draft dissertation is ready (as per your advisor and/or committee), it is handed to the committee for formal review and a defense date is set,
- Next the defense – a formal seminar and Q&A defense, this is truly the final exam,
- Once you have successfully completed the defense, you must edit/correct the dissertation as per the committee's comments and deposit the dissertation with the Office of Graduate Education,
- Then, at long last, Graduation and on to the next phase of your career.