HOW TO WRITE A PHD

Adapted from Geva Greenfield’s lecture
TOPICS

- Before & During writing-up
  - Requirements & Timeline
  - Content
  - Style and form
  - What to aim for – Expectations
  - Tips & pitfalls
  - Final product and submission
High quality presentation that reflects the hard work & new knowledge & expertise acquired during the PhD

What is a PhD?
- In-depth study & critical examination of a specific topic
- Original and creative piece of research developed autonomously
- Provide new knowledge and useful discoveries
- Work of publishable quality in scientific journals or international meetings
  - Thesis should reflect this

- Exercise of patience & frustration (not afraid to start again)
- Learn and develop skills to navigate the unknown & be your own judge
- Opportunity to make friends and new colleagues (build network)
  - Use this to your advantage when writing the thesis
PHD THESIS

- **Before starting**
  - Find your bearings
  - Revise relevant information from College website on the thesis and viva
  - Reflect on what makes a good thesis: expected content and form
  - Read examples of theses
  - Read the recent literature

- **Getting started**
  - Make a plan – Content and timeline
  - (Update) Thesis content - feedback from supervisor
  - Make a writing plan /list of chapters & main sections
  - Scheduling (supervisor feedback and proof reading)
  - Make a checklist & timeline: content & admin issues
  - Budget sufficient time

http://www3.imperial.ac.uk/registry/exams/thesisandvivas
REQUIREMENTS

The thesis shall:

- Candidate’s own account of his/her work – mostly accomplished after the PhD registration
- Sole or collaborative work - Declaration of own sole or shared work
- Not submitted for similar degree elsewhere
- Not be a series of papers – published work can be included
- Acknowledge the work of others or self published work: Copyright issues (permission & declaration for 3rd party or own published work/papers, etc)
- In English (In a foreign language IF agreed by graduate School)
  - <100,000 words(excluding bibliography/references/appendix, including footnote)
- Thesis must be submitted in the adequate electronic format & in accordance with instructions obtainable from the Academic Registrar

(1) Regulations for a PhD:
www.imperial.ac.uk/media/imperial-college/administration-and-support-services/registry/academic-governance/public/regulations/2015-16/academic-regs/PhD-(including-MPhil).pdf
(2) See page 6 of above document;
(3) Reproducing third party or own work in a thesis
www3.imperial.ac.uk/scholarly-communication/spiral-digital-repository/phd-theses/third-party-copyright
(4) www3.imperial.ac.uk/registry/exams/thesisandvivas.
1. Initial thesis submission – Viva copies
   - Nomination of examiners and Examination entry form
   - Thesis declaration form (Registry)
   - Writing-up status form: CRS – completing research status: in college or away from college (no access to facilities or formal supervision)
   - Electronic submission – www.ethesis.co.uk (2) → examiners

   - [Submission checklist](http://workspace.imperial.ac.uk/registry/Public/Current%20Students/Submission%20Checklist%20for%20Imperial%20College%20Degrees_Dec%202014.pdf)

1. Final thesis submission - Final copies
   - Corrections if needed
   - Spiral Submission, the College Digital Repository (2) – open access

[1](http://www3.imperial.ac.uk/registry/exams/thesisandvivas);
[2](http://workspace.imperial.ac.uk/registry/Public/Current%20Students/Submission%20Checklist%20for%20Imperial%20College%20Degrees_Dec%202014.pdf);
[3](http://workspace.imperial.ac.uk/registry/Public/Current%20Students/Submission%20Checklist%20for%20Imperial%20College%20Degrees_Dec%202014.pdf)
A GOOD THESIS (1)

Candidate own work & writing

ORIGINAL WORK?

1. Your own!
   - Own words, ideas and judgments
   - Careful of plagiarism: Text and ideas: Quote, references & attribute

2. New work =
   - New data
   - New methods
   - New interpretation
   - New application
   - New questions
   - New way of testing knowledge
   - New connections

Adapted from Geva Greenfield, PhD
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A GOOD THESIS (2)

- Good discussion of strengths and limitations – methods and results
- Sharp summary of results and importance of thesis contribution
- Has an appreciation of what comes next
- Appreciation of implications of results in wider context

- Focuses on the interesting and important information
- Attention to details:
  - Well-illustrated with figures and graphs (Acknowledge permission if needed)
  - Written without grammatical and spelling errors

Adapted from Geva Greenfield, PhD
**EXAMINERS’ EXPECTATIONS**

- **In short – a coherent, readable and well presented “credible” story**
- **Interesting piece that they can learn from – leading to interesting scientific discussion with an expert in the field**
- **Look for:**
  - Adequate knowledge of the field
  - Know the literature in depth and breadth
  - Comprehensive, relevant and up to date literature
  - Well reasoned and well designed studies
  - Clear and logical presentation of key results - Judicious choice of figures and tables
  - Effective arguments and conclusions
  - Well written – Accurate Unambiguous
  - Attention to details – (minimise typos!!!)
  - Coherent – strong rational and story line
  - Convincing
  - Honest – contributions of others
  - Implications & Limits
EXTERNAL EXAMINER’S CHECKLIST

Why? So what? Do I believe it?
✓ Research aims clear?
✓ Literature reviewed/ critiqued?
✓ Key papers included?
✓ Theoretical basis sound?
✓ Conjectures consistent with theory?
✓ Appropriate methodology?
✓ Evidence collected ethically?
✓ Sufficient evidence?

✓ Convinced of reliability and validity?
✓ Findings assessed against literature?
✓ Findings make significant contribution to the field? How?
✓ Any inconsistencies?
✓ Conclusions/take home message?
✓ Convinced that the work was carried out by the student?

IS THE EXAMINER AN EXPERT IN YOUR FIELD?

Non experts – can be even more objective & critical
EXAMINERS DON’T LIKE

- **Bad thesis which are painful to read**-
  - Not interesting or too much material badly summarised or organised
  - Need to guess, hypothesise or have to synthesise results to extract take home messages

- **NO-NO:**
  - Lack of objectivity
  - Small or badly described problems
  - Poorly reasoned & pre-conceived idea not based on data
  - Badly-designed & executed experiments
  - Poorly present methods – not reproducible
  - Insufficient analysis quantitative analysis – only describe and does not explain results
  - Repeats or confirms well-established facts
  - Has poor presentation and choice of graphs and illustrations
  - Overselling and under selling results
  - Errors and Badly reference own or third party work
  - Conclusions not aligned with results
  - Too many grammatical and typing errors & lots of repetitions
  - Poor use of English & lack of precisions
  - Sloppy presentation
  - Arrogance and failing to acknowledge contribution of others

From Geva Greenfield, PhD
Before starting - Find your bearings
- Revise relevant information from College & on the viva process
- Reflect on what makes a good thesis: expected content and form
- Read examples of theses from your Department
- Read the old and recent literature

Make a plan – Content and timeline
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TYPICAL THESIS CONTENT

- Title page
- Declarations (originality, copyright, thesis declaration form)
- Table of content
- List of figures and tables
- Acronyms
- Abstract
- Introduction
- Literature review
- Aims and Objectives
- Methods
- 2 to 4 substantial results chapters (include discussion)
- General discussion
- Conclusion - implications and future directions
SPECIFIC CONTENT

- Introduction (WHY?)
  - Literature review
  - Context
  - Theory
  - Gaps
- Objectives
- Methods (WHAT and HOW? In sufficient details)
- Results (WHAT did you find?)
  - Careful selection of figures & tables
  - Add texture!
  - Style according to your discipline
- Discussion (WHAT does it mean?)
  - Strengths & limitations
- Final chapter
  - Conclusions and suggestions for further work
- References
- Appendices (additional details, published papers & permission for copyright)
SOME DISCIPLINE

- Good writing is challenging!
- Establish an undistracted writing routine – that works for you
- Start with relatively detailed structure - Skeleton
  - Table of content
  - Main sections
- Flesh it out
  - Start with the most comfortable chapter - easiest (previously published paper, clearest results)
  - Small pieces
  - Set realistic deadlines/deliverable
SOME DISCIPLINE

- List and tick
- Set realistic goals and reward yourself for even a little progress

- Work in bursts; take short breaks
- Don’t stall on details, walk away (ideas/logical flow first, style after)
- Seek help from the experts: supervisor, library, faculty training programs
- Rest chapters
- Consistency across chapters
SELL YOUR IDEA!

Keeping your ideas short, simple and clear:

- Describe and justify worthwhile, single, overall objectives of your research
- Articulate specific aims that are clearly related to one another and logically fit under the umbrella of the overall objectives
- Present gaps in our knowledge & implications
- Plant the seed for achieving each specific aim by presenting the questions to be asked which will fill the gaps

➔ Rational and objective of your research in a nutshell

Adapted from Geva Greenfield’s lecture
Make the presentation clear and simple but precise & to the point; avoid verbose

Think of the reader/reviewer – “lazy”

Give all the information in a user-friendly but unambiguous way:
  - Assume total ignorance (or research subject but not dumb!) on the part of the reviewer
  - Provide all of the required conceptual background – basic and in simple terms
  - No abbreviations or acronyms without definition
  - Use diagrams to illustrate concepts and models or conceptual framework – well labeled and explained
  - Make sure figures and tables are introduced and referred to - or omit them
  - Use formatting for emphasis -> not too much
  - Use key words - don’t worry about repetition of terms
LINK YOUR WORK TO YOUR FIELD

- Describe existing research and how your work builds on it:
  - Are you contesting a view?
  - Are you making existing theories/evidence more robust with additional perspectives?
  - Are you filling a gap?

- How are you adding value to your field?

- Clearly identify own contribution: “I” rather than “We”
<table>
<thead>
<tr>
<th>DON’T FORGET (1)</th>
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<tbody>
<tr>
<td>- Take detailed notes during your PhD</td>
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<td>- Develop a filing system</td>
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<tr>
<td>- <strong>BACK UP!</strong></td>
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<tr>
<td>- Copy your research log</td>
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<tr>
<td>- Check University regulations &amp; deadlines</td>
</tr>
<tr>
<td>- Set clear &amp; realistic goals for each week/day/hour</td>
</tr>
<tr>
<td>- Use your outline &amp; be organized</td>
</tr>
<tr>
<td>- Set yourself harder deadlines and milestones</td>
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<tr>
<td>- Repetitions, stagnation and long hours is normal</td>
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<td>- Choose examiners carefully – defending a well written thesis should be challenging but fun too!</td>
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DON’T FORGET (2)

- You need to practice writing – courses, papers etc
- You need to read PhD theses (not least so you know what being the audience for a thesis is like)
- It takes longer than you think – plan enough time
- **It will likely take many iterations to make it very good and select most appropriate results, review / reshape the essential logical skeleton or argument of your own thesis or research.**
  - Stop – forget – start again
- **Final details and proof readings essential – help from colleagues and non experts (friends)**
- There are moments when you will not enjoy it as much as you thought you would – it’s normal
- **Stay positive:** If your are stock writing up, it is because you have nearly finished your PhD!
EXPECTATIONS FROM SUPERVISORS

- Be pro-active
- Take the lead of your PhD & thesis
- Style and writing reflect quality of the work
- Allow & agree on sufficient timeframe for feedback & chapter revisions
  - E.g. some supervisors cannot judge the work unless it is presented completely → present a neat, complete version of each chapter
  - Some supervisors stop reading if too many mistakes → proof-read thoroughly and spell checked
  - Don’t expect a chapter to be read many times
- Contingency plans for unexpected delays

→ Your supervisor wants you to have a good thesis but it is your responsibility to deliver
Create your own checklist:

- Does the content match the title?
- Are important points emphasized enough?
- Is the content within each section appropriate?
- Is there a logical sequence?
- Are information sources acknowledged?
- Do the conclusions relate to the objectives & results?
- Have you followed the conventions and regulations?
- Is the meaning of each sentence clear - or open to interpretation?
- Can long sentences be broken down or written more efficiently?
- Is the language, terminology, and presentation consistent across chapters?
- Are all inserts well explained, readable, labeled and used?
- Ask a friend who knows nothing about the subject to proof read
Self criticism– be you own examiner!

- Why is it important? What critical information would be missing without this work?
- Why did you use this method/approach
  - Be clear on its advantages and limitations
- Is your interpretation the only possible explanation?
  - How strong is the evidence from your results? Does it confirm your hypothesis
  - Support from the literature
  - Confirmation from further work
- Anticipate the debate!
  - Can the work have been done in another way?
  - If you were the examiners – what would you pick on?
  - What other results might you want to see?
- Ask a colleague to give feedback; Think about the Viva
Can you summarise your thesis in 5 minutes?
What are your main findings?
What is original about your research?
Describe your methodology and why you decided to use this – couldn’t you have done another way?
Can you highlight the major contribution that your thesis makes?
How do your findings relate to the literature?
Why are your results different than so and so?
Who are the most exciting research questions in your field?
What has been published on the subject in the last 6 months?
But also – anything from your undergraduate or previous studies (evidence of fundamental understanding of the area)
Have you seen the latest paper on … last week?
Can you explain what you mean here or how you did this?
What recommendation would you make to policy makers?
The decision to submit a thesis rests with the candidate alone.
Opinion of supervisor(s) matter!
Checklist
SUMMARY - TIPS

- The better the thesis the easier the Viva
- Commitment
- Organization and planning
- Write continuously
- Less is more:
  - Say more with less → difficult and needs practice
- Do (very) good enough
- Realistic timeline
- Nothing is set in stone
- Develop skills to double check your work
- Edit work of others
- Write and sleep on it

→ PhD is a marathon – some miles are easier than others
SUMMARY - PITFALLS

- Poor organization & Time management & Starting too late
- Procrastination & Over-perfection
- Not an integrated body of work; disjoint chapters, too descriptive and not analytical or experimental enough
- No compelling case made for the theoretical or practical utility of anticipated findings
- Saying too little on too much – too much on too little – repetition
- Lost in complexity and abstraction
- Bad choice of figures
- Too many typos
- Cumbersome sentences
- Writing fatigue: general discussion – not summary and highlighting its importance

→ Look matters – Look is not enough
USEFUL LINKS AND WEBSITES

- Thesis submission and viva
  - [http://www3.imperial.ac.uk/registry/exams/thesisandvivas](http://www3.imperial.ac.uk/registry/exams/thesisandvivas)
- Passing your viva & examiner perspective
  - [http://www3.imperial.ac.uk/graduateschool/currentstudents/onlineresources/passingyourviva](http://www3.imperial.ac.uk/graduateschool/currentstudents/onlineresources/passingyourviva)
- Preparing your thesis for submission to the Spiral Digital Repository (permission to reproduce own or third party work, plagiarism awareness)
  - [http://www3.imperial.ac.uk/scholarly-communication/spiral-digital-repository/phd-theses](http://www3.imperial.ac.uk/scholarly-communication/spiral-digital-repository/phd-theses)
- Compulsory course
  - [http://www3.imperial.ac.uk/graduateschool/plagiarismawarenesscourse](http://www3.imperial.ac.uk/graduateschool/plagiarismawarenesscourse)
  - [http://www3.imperial.ac.uk/scholarly-communication/spiral-digital-repository/phd-theses](http://www3.imperial.ac.uk/scholarly-communication/spiral-digital-repository/phd-theses)
- Completing Research Status - Writing-Up
  - [http://www3.imperial.ac.uk/registry/researchdegrees/writingup](http://www3.imperial.ac.uk/registry/researchdegrees/writingup)
  - [https://workspace.imperial.ac.uk/registry/public/Exams/ethesis_FAQ.pdf](https://workspace.imperial.ac.uk/registry/public/Exams/ethesis_FAQ.pdf)
- Academic ladder
GOOD WRITING