Research Skills Workshops for Graduate Research Students

4. Conceptualising Your Research

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Presenter:

Dr Krystyna Haq
krys.haq@uwa.edu.au
Graduate Education Officer

http://www.postgraduate.uwa.edu.au
Objectives

- To clarify your ideas about your research and your thesis
- To reflect on strategies that will lead you effectively through your candidature and beyond
## Timetable

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>4.00 – 4.30</td>
<td>Conceptualising your thesis and writing for your research</td>
</tr>
<tr>
<td>4.30 – 5.00</td>
<td>Planning your professional development</td>
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Conceptualising your Thesis

Getting what you came for

What should a candidate be enabled to do?

- where appropriate, initiate and plan a research project
- acquire the research skills to undertake it and gain adequate access to resources
- complete it on time
- produce a high-quality thesis
- be successful in examination
- disseminate the results
- lay the basis for their future career"

As you develop your research proposal you will engage with these elements important for your research and your future:

- Managing your research
- From research topic to research question
- Communicating your research
- Data collection and analysis*
- Writing for your research
- Becoming a research professional

* “Data analysis and synthesis skills are the most transferable PhD-completion skills. They are critical in 75% of careers and are equally likely to be key in faculty careers, in business, government and non-profit careers, and in non-faculty academic work” (Rudd et al. 2008 p. 1)
What do you need to demonstrate?

“The (Masters) degree must be a substantial work generally based on independent research which shows a sound knowledge of the subject of the research, evidence of the exercise of some independence of thought and the ability of expression in clear and concise language”

“The (PhD) thesis shall be a substantial and original contribution to scholarship, for example through the discovery of new knowledge, the formulation of theories or the innovative re-interpretation of known data and established ideas”

And merit criteria

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<th>Criteria</th>
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<tr>
<td>The candidate shows familiarity with, and understanding of, the relevant literature.</td>
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<tr>
<td>The thesis provides a sufficiently comprehensive study of the topic.</td>
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<tr>
<td>The techniques adopted are appropriate to the subject matter and are properly applied.</td>
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<tr>
<td>The results are suitably set out, and accompanied by adequate exposition.</td>
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<tr>
<td>The quality of English and general presentation are of a standard for publication.</td>
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Thinking about your Thesis

Format:
- Title Page
- Summary or Abstract
- Table of Contents
- Acknowledgements
- Statement of Student Contribution
- Main Text
- Bibliography or References
- Appendices


Length
PhD: <100,000 words (<80,000 words preferred)
Master: <50,000 words

Layout
Margins: 4cm on left, 2cm elsewhere
Spacing: 1.5 or double spaced on A4 paper, double sided preferred with mirrored margins (set up template early)

What should the Main text section contain?

- It must introduce the research problem and situate it against the current body of knowledge. It must provide details of methodology and methods, results, discussion and conclusions.
- It may consist of work that is wholly unpublished (but not unpublishable), all published, all or partly in the process of being published, published in a mixture of scholarly and other media or published in parallel.
- Thesis chapters may be expanded versions of journal papers (examiners often wish to see more detail about lines of reasoning and methods applied than do journal editors).
- Some students present their published work in their theses as published, but reformatted for consistency of style.
- The main text section must read as a coherent document and as a whole, tell a coherent story.
- The reporting of sufficient scientifically rigorous work to meet the requirements for the awarding of the degree as outlined in the examination criteria.
Some examples: note the range of formats and the differences in publications arising from the thesis.
What is a thesis?

A thesis is a sustained argument.

A thesis is not the same as a topic to be investigated. While a topic may be the structure of a particular crystal … a thesis is a statement that says, for instance, something about crystals. The distinction is important since in many ways the statement of a thesis determines the approach and stance writers take towards their topics or research questions.

A thesis is an idea or theory that is expressed as a statement, a contention for which evidence is gathered and discussed logically. The statement nearly always begins with the word *that*.

…*that* therapies designed to address the underlying cognitive processes for language production are more effective than those based on the rules for language production, in treatment for word finding difficulty after stroke.

…*that* the association of rare plant species and ironstone rock communities is related both to specialisation required for survival in a harsh environment, and to low genetic plasticity

…*that* it is possible to develop a new temporal logic of robustness that is more suited to reasoning about reactive systems in the abstract, than are existing logics of reliability

…*that* a numerical modelling approach can produce a useful tool for the prediction of jack-up behaviour in mobile offshore drilling rigs under general combined loading in three dimensions.

The thesis statement usually appears in the first chapter where the background to the study is described. It will often determine the framework for the literature review and the data collection and it is revisited in the last chapter. It permeates the whole study.

Determining your Thesis

It is not always easy to determine your thesis argument, however as your research progresses, your thesis will become clearer to you.

As your thesis argument becomes clearer, you may need to make some difficult decisions about what work to exclude from your thesis document.

As you work to determine your thesis keep these key questions in mind:
1. What is the thesis problem?
2. Why is the research needed?
3. What are the gaps/deficiencies in current knowledge as determined by a comprehensive critical review of the literature?
4. What is your thesis question? To answer this, reframe the thesis problem into an overarching question your thesis will answer.
5. The answer to your thesis question will be your thesis statement. It will be the thread that runs throughout the thesis. Every part of the thesis will relate to this in some way.

A simple example of a thesis story:
Once upon a time…researchers found that fact mnemonics (mnemonics for remembering facts) were useful in teaching students with learning disabilities. However, very few researchers had looked into the usefulness of process mnemonics (mnemonics for remembering rules and procedures). The few studies that have looked into the uses of process mnemonics did so only with respect to teaching students without learning disabilities. It occurred to one researcher though that because process mnemonics are supposed to help in remembering “how to” do things, they might help overcome some of the main difficulties that students with learning disabilities have in reading, writing, and mathematics. He decided to examine the usefulness of including process mnemonics in teaching computational skills to students with mathematics learning disabilities. After doing his experiments in schools and a lot of hard work, this researcher discovered that compared to the provision of other forms of instruction, process mnemonics produced greater improvements in the students’ computational skills performance. Thus, he was able to show that process mnemonics can be useful in teaching students with mathematics learning disabilities.

For examples of well presented thesis stories go to http://www.postgraduate.uwa.edu.au/news/3mt
Exercise: What might your thesis be?
I would like my thesis to argue that…
Writing for your Research
Throughout your candidature you will need to make progress both with the research and with the thesis. An effective way to make progress with the thesis is to write throughout candidature, using both informal and formal writing to build a thesis over time.

Brown’s 8 questions to guide the drafting of a research article
Brown, R. (1994/95) Write Right First Time Literati Newsline Special Issue: 1-8

Note: You can answer these questions in any order.

1) What is the working title for your paper or chapter?

2) Who are the authors?

3) What is the anticipated journal or publisher?

4) Who are the intended readers?
Name 4-6 potential readers, give their names and why they would be interested in this article.

5 a) What is the central question your paper will pose? (approx. 30 words)
5b) What is the answer it will provide? (approx 30 words)

5) If your readers had only one sentence to summarise your article, what should it be? (approx. 25 words that focus on the outcomes from the work rather than the inputs).

7a) Why did you do the work? (approx. 70 words). Briefly outline the problem and why it is important.
7b) What did you do? (approx. 70 words) Briefly outline the methods you used to gather evidence.

7c) What happened? (approx. 100 words). Briefly outline the key results. Focus on outcomes.
7d) What can you add to theory? (approx. 70 words). Think about how your results and conclusions will change how people see the world.

7e) What can you add to practice? (approx. 70 words). Think about how your results and conclusions might change what people do.

8) What remains unresolved? (no word limit). This is mainly for your own benefit to help you think about where your research sits in the body of knowledge, but some of it may also be useful in your discussion.
Drafting, Revising, Editing and Proofreading

References:

A. Drafting

“In the first draft of your thesis you are really finding out what you know. In a sense, you are writing for yourself, so the first draft is experimental.” (Elphinstone and Schweizer, 1998 p. 81)

B. Revising

“Skilled writers revise constantly, trying to resolve the tensions between what they want to say, and what the sentences actually record. For many skilled writers revising is the crux of the writing process. It is the way they shape prose into meaning for an audience, and the way they discover what they want to say, sometimes to their own surprise.” (Yang, quoted in Elphinstone and Schweizer, 1998, p. 83).

The first revision of your draft should take account of 4 things¹:

- **Revising for audience**: what adjustments do you need to make to your draft to take specific account of your intended audience?
  - Who are they and what expectations are they likely to have?
  - What will they know already? What must you tell them? What lines of evidence are convincing for that audience?

  Academic documents have particular structures, for example many scientific papers follow an AIMRaD structure (Abstract, Introduction, Methods, Results and Discussion), and readers expect to find certain kinds of information in particular sections. Thesis examiners and reviewers of journal papers will look for answers to the following questions, and will search for them in particular sections of the document²:
  - Is the contribution new? (*Introduction, Abstract*)
  - Is the contribution significant? (*Introduction, Discussion and Abstract*)
  - Is the organisation and length of the written document acceptable (*All*)
  - Do the methods and the treatment of results conform to acceptable scholarly/scientific standards? (*Methods and Results*)

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¹ Based on Hairston, M. *Successful Writing* 3rd edition, p. 91 - 101
• Are all conclusions firmly based in the data presented? (Results compared to Discussion and Abstract)
• Are all the figures and tables necessary?
• Are figure legends and table titles adequate?
• Do the title and Abstract clearly indicate the content that follows? (Title, Abstract compared to Introduction and Discussion)
• Are the references up to date and complete, are journal titles correctly abbreviated? (References)
• Is the work excellent, good or poor? (All)

• Revising for purpose:
  o what is the focus of the draft? Is this obvious?
  o Are the arguments you are making clear? Are your inferences defensible?
  o Could the data or supporting lines of evidence be rearranged to make the important points more prominent?
  o Do you need an example to illustrate an important point?
  o Does your working title need adjusting? “Good titles clearly identify the field of the research, indicate the story the results tell and raise questions about the research in the mind of the reader” (and therefore entice them to read the paper) (Cargill and O’Connor 2009 p. 16)

• Revising for proportion:
  o cut material from your draft that no longer fits the focus or purpose of the paper (even if you spent a lot of time and energy on writing those parts of the draft).
  o Expand on interesting parts of the draft that fit with the focus or purpose of the paper.
  o In a thesis, about 60% of the text should be devoted to new material that has been generated from the research, and about 40% to what is already known from the literature (Dunleavy, 2003)

• Revising for organisation:
  o does the paper have a clear pattern that the audience can follow?
  o is there a pattern of moving from the general to the specific?
  o do you introduce ideas before you develop them?
  o does one idea lead logically to the next?

  - look at how your thoughts are organised by just looking at your headings and subheadings.
  - do your headings comprise a hierarchy of ideas that moves from more general ideas to more specific ones?
  - do the headings accurately predict the content that follows? Are the headings informative enough?
  - might the information be more effective if one or more tables or diagrams were added?
The second revision of your draft can focus on more detailed aspects such as
• do you need to use a citation to substantiate this point?
• would an example make this point clearer?
• have you answered any objections that may be made to your assertions?
• do you have strong opening and closing paragraphs?

C. Editing
“Editing is about getting your text in good shape for your reader” (Elphinstone and Schweizer, 1998 p. 85).

1. The key importance of paragraphs – each paragraph must make a point, and should have a topic sentence that accurately states that point.

2. Use short, well-planned sentences that convey information (ie be concise and precise). Each sentence must have a subject and a verb. In general, the subject should come before the verb.

3. Guide the reader with transition words and discourse markers to help them easily see what you are arguing.

D. Proofreading
Checking accuracy and consistency in use of language, in style and layout

Some useful workshops offered by StudySmarter
(More details at http://www.studysmarter.uwa.edu.au)
Grammar Clinic
How to Write Coherently
How to use other people’s voices in your writing
How to read critically
How to establish a critical voice in your writing
How to argue critically
Writing as part of a research routine
Academic writing is iterative and incremental, that is, it is written and rewritten numerous times in a number of stages. Obtaining constructive feedback speeds the process of producing writing of good quality.

How can you integrate writing into your research routine?

What tips and techniques for writing and for obtaining constructive feedback on your writing, can you share with the group?

Some useful references:

Possible outcomes from your research degree:
Postgraduate Destinations 2010 (Compiled by Graduate Careers Australia).

This survey collected data from Australian citizens and permanent residents who completed the requirements of their postgraduate degree in 2009 and responded to the Graduate Destinations Survey (GDS) in 2010. Responses were received from 3,417 Masters and PhD students. 85% were employed full-time, 77% were in long-term full-time jobs.

<table>
<thead>
<tr>
<th>Sector</th>
<th>percent employed</th>
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<tbody>
<tr>
<td>Higher education</td>
<td>36</td>
</tr>
<tr>
<td>Business/industry</td>
<td>31</td>
</tr>
<tr>
<td>Other Education</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
</tr>
<tr>
<td>Government</td>
<td>8</td>
</tr>
<tr>
<td>Private practice</td>
<td>5</td>
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</tbody>
</table>

“Professional development for PhD students: do they really need it?”
Rudd, E., et al. CIRGE Spotlight on Doctoral Education #2. CIRGE: University of Washington, Seattle www.cirge.washington.edu

“PhD students today need more than disciplinary training….They need to be able to communicate complex research findings to diverse audiences, work in interdisciplinary contexts, apply knowledge in commercially viable, socially responsible and ethical ways, and take on leadership roles in knowledge-rich environments in complex organizations.” (p. 4)

“Data analysis and synthesis skills are the most transferable PhD-completion skills. They are critical in 75% of careers and are equally likely to be key in faculty careers, in business, government and non-profit careers, and in non-faculty academic work” (Rudd et al. 2008 p. 1)

“Survival Skills for Scientists” by Federico Rosei and Tudor Johnson, Imperial College Press, London

Basic Choices – knowing yourself, setting goals, matching your goals to your character and talents, work style choices, choices of work climate

Basic Strategies and Actions – career choices and personal choices, finding mentors, character traits that lead to success, developing desirable character traits – self-organisation, rigor in science and meeting deadlines, patience!, Stand up for yourself!, fighting against the odds, nothing succeeds like success etc

The Game of Science – peer review system, ethics in science, when ethics fail, intellectual property rights and patents, gender-equal opportunity employment etc

Acquiring and Using a Reputation – getting known in your science, where and how to publish, what conferences can do for you, what seminars can do for you, employment interviews, getting your science funded etc

Communicating your Science – scientific writing, peer reviewed publication, theses, curriculum vitae, oral presentation and organisation, poster organisation and presentation

Cautionary Tales – R’s near fatal M.Sc. experience, insecurity and stubbornness can be fatal, half-hearted decisions are unwise, thinking outside the box etc
### A framework for your continued professional development
(adapted from Researcher Development Framework, Vitae, 2010):

<table>
<thead>
<tr>
<th>Skills and competencies</th>
<th>Evidence of current competence</th>
<th>Development required</th>
<th>Resources available</th>
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<tbody>
<tr>
<td>Discipline based knowledge</td>
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<td>Coursework units</td>
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<tr>
<td>Knowledge of research methodology</td>
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<td>Coursework units <a href="http://www.postgraduate.uwa.edu.au/students/journey/data">www.postgraduate.uwa.edu.au/students/journey/data</a></td>
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<tr>
<td>Information seeking skills</td>
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| Skills in managing Information | www.is.uwa.edu.au/research/training  
   www.postgraduate.uwa.edu.au/students/journey/managing |
| Critical thinking, skills in the scholarly evaluation of information and ideas | www.postgraduate.uwa.edu.au/students/journey/writing  
   www.studysmarter.uwa.edu.au  
   www.postgraduate.uwa.edu.au/students/proposals/format/research-plan |
| Skills for problem solving |  |

**Personal effectiveness: the personal qualities and approach to be an effective researcher**

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<tr>
<th>Skills and competencies</th>
<th>Evidence of current competence</th>
<th>Development required</th>
<th>Resources available</th>
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</table>
| **Personal qualities** including enthusiasm, perseverance, self-confidence, self-reflection, responsibility and integrity |  |  | www.postgraduate.uwa.edu.au/students/resources  
   www.postgraduate.uwa.edu.au/students/policies/expectations |
<p>| <strong>Self-management</strong> through preparation and prioritisation, commitment to research, effective time management, responsiveness to |  |  |  |</p>
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<th>change, maintaining an effective work-life balance</th>
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<tr>
<td>Professional and career development</td>
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<tr>
<td>Responsiveness to opportunities, Building and maintaining your reputation, Building professional networks, Engaging in continuing professional development.</td>
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<tr>
<td>Working with others</td>
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<tr>
<td>Collegiality, mentoring, collaboration and teamwork, leadership.</td>
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### Understanding the research environment

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<th>Skills and competencies</th>
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<th>Development required</th>
<th>Resources available</th>
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<td>Safety and health in research</td>
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<td><a href="http://www.safety.uwa.edu.au/induction-and-training/courses">www.safety.uwa.edu.au/induction-and-training/courses</a></td>
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<tr>
<td>Legal requirements in research</td>
<td><a href="http://www.postgraduate.uwa.edu.au/students/journey/professional">www.postgraduate.uwa.edu.au/students/journey/professional</a></td>
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<tr>
<td>Intellectual property and copyright</td>
<td><a href="http://www.postgraduate.uwa.edu.au/students/policies/ip">www.postgraduate.uwa.edu.au/students/policies/ip</a></td>
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</tbody>
</table>
| Understanding the processes for evaluating research and its quality | www.is.uwa.edu.au/research/training  
www.research.uwa.edu.au/staff/rau  
www.research.uwa.edu.au/staff/era |
| Gaining and managing resources for research | www.postgraduate.uwa.edu.au/students/funding  
www.scholarships.uwa.edu.au  
www.psa.guild.uwa.edu.au  
www.postgraduate.uwa.edu.au/students/proposals/format/costs |
| Planning a research project and delivering outcomes | www.postgraduate.uwa.edu.au/students/proposals |
| Managing risk in research | www.postgraduate.uwa.edu.au/students/proposals/format/scholars  
www.postgraduate.uwa.edu.au/students/proposals/format/facilities  
www.postgraduate.uwa.edu.au/students/proposals/format/fieldwork  
www.postgraduate.uwa.edu.au/students/proposals/format/confidentiality  
www.postgraduate.uwa.edu.au/contact/ethics |

Making an impact with your research

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<th>Skills and competencies</th>
<th>Evidence of current competence</th>
<th>Development required</th>
<th>Resources available</th>
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24
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<tr>
<th>Skill Area</th>
<th>Resources</th>
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<tr>
<td>Skills in communicating and disseminating your</td>
<td><a href="www.postgraduate.uwa.edu.au/students/resources">www.postgraduate.uwa.edu.au/students/resources</a></td>
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<tr>
<td>research to your peers</td>
<td><a href="www.osds.uwa.edu.au/pd">www.osds.uwa.edu.au/pd</a></td>
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<tr>
<td>Communicating your research to a wide audience</td>
<td><a href="www.postgraduate.uwa.edu.au/students/3mt">www.postgraduate.uwa.edu.au/students/3mt</a></td>
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<tr>
<td>Interacting with the media</td>
<td><a href="www.animals.uwa.edu.au/research/science-communication/workshops">www.animals.uwa.edu.au/research/science-communication/workshops</a></td>
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<td>Understanding entrepreneurship</td>
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<td>Policy making processes: how does research fit</td>
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