Professional Development
Write a Research Proposal
Week 1: Getting Started with Research Proposals

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Learning and Assessment

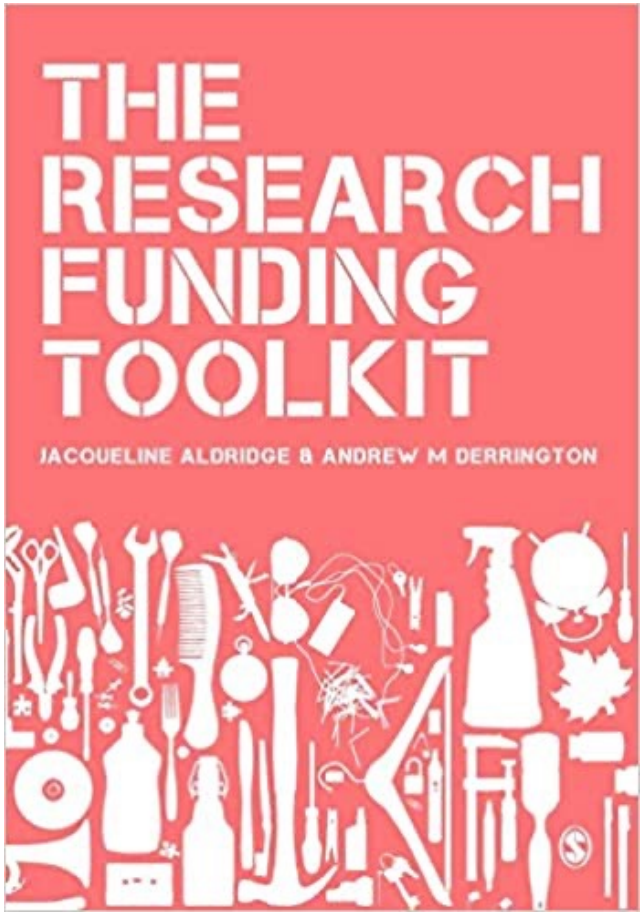
Intended Learning Outcomes (ILO)	On the successful completion of the course, students will be able to:
ILO 1	Analyse, describe and interpret discipline specific quantitative data.
ILO 2	Write a scientific report that presents the outcomes of discipline specific data analyses.
ILO 3	Plan a strategy for collecting data that is based upon a consideration of what has been previously published.
ILO 4	Frame a research question relevant to an independent project.
ILO 5	Assess risk of lab/field work or research method.
ILO 6	Write a research proposal outlining question to be addressed, background, methods, risks involved, logistics and resources required.
ILO 7	Prepare and present oral scientific arguments on a discipline specific topic.

Assessment type	% Weighting within unit	Hand out and hand in dates	Length	How, when and what feedback is provided	ILO tested
Report (individual; Research proposal)	50%	Start Week 1 Semester 2; submit in Week 10 Semester 2.	Max 1500 words	Formative personalised feedback on draft text is provided (generally verbally) before submission; Semester 2 Week 12.	3, 4, 6

- ILOs 3, 4, and 6 are tested in semester 2.
- The ILOs give the basic summary of what you should learn / achieve.
- We will go into proposal writing deeper during the tutorials.
- You should plan to watch a very short video, and do some reading in between tutorials.

Useful Reading

- Although focussed on research funding for academics, many of the points are relevant in writing effective research proposals
- I will be setting reading from this book throughout the tutorials
- You will pick up useful tips each week, which we will consolidate by discussing in the synchronous sessions



Recommended book – I read last semester and has a lot of useful tips

Who writes Proposals?
(from my experience)

- Academics in Universities
- Postdoctoral students
- Undergraduate students
- Post doctoral researchers
- Volunteer organisations
- Private sector / businesses – e.g. developers

How are Research Proposals decided?
(from my experience)

- Referee reports / Peer review
  - May or may not be experts in the field
- Panel meeting that discuss the proposals (and maybe rank them)
- Academics at Universities
- Other funding decisions are usually a similar set-up

What makes a good proposal?
(from Research Toolkit)

- Invest in the best research. Does the proposal offer a realistic promise of an answer to an important question?

- Four key propositions:

- **Importance**:
  - The proposal asks an important question
- **Success**:
  - The project is likely to answer the question
- **Value**:
  - The likely gain from this project is worth the resources requested
- **Competence**:
  - The applicant are competent to carry out the project

Your proposal should …
(from Research Toolkit)

- Be easy to read / “speed-read”
- Be easy for a non-specialist to remember, understand and summarise.
- Make it easy for readers to reconstruct the essence or your proposal and communicate how it meets the 4 key propositions.
- Provide an “at a glance” overview of your project to others.

We will cover top-tips on how to achieve this in the tutorials.

Main points

- You have to convince decision makers that your proposal is worth investing in.
- There is usually some level of competition that you will have to compete with for limited resources.
- There are 4 key propositions
  - Importance
  - Success
  - Value
  - Competence
- Your proposal needs to be easy to read, and remember.
- Choose a topic from list and discuss in groups what you could write about the 4 key propositions.

Some past projects

(mainly atmospheric)

1. Evaluation of low-cost metal oxide sensors to measure air quality
2. An investigation into the drivers of seasonal variation in aerosol optical properties in the North East Atlantic region
3. Analysis of cold pools and dust uplift in the Sahara
4. Pockets of Open Cells: the control on the formation of gaps in clouds in the South-East Pacific.
5. Modelling concentration of PM2.5 with social development of China through supervised learning techniques.
6. Quantifying the effectiveness of HEPA air cleaners at removing particulate matter and black carbon from classrooms
7. A cost-benefit analysis of marine cloud brightening
8. Quantification of the relative contribution of aerosol and cloud factors to rain on the ground.
9. Analysis of ice nucleation data from the FIN-02 experiment.
10. The effect of ultra-viscous aerosol on the formation of cirrus clouds
11. Road traffic pollution modelling: a case study on princess parkway
12. Investigating the relationship of ice nucleating particles and soil dust
13. The impact of restaurants on particulate matter levels in Manchester city centre.
14. An observational study of atmospheric ice nucleating particles on polluted days.
15. The Glaciation of mixed-phase clouds
16. Dynamics of Rossby waves and shear instability of Saturn’s Hexagon