How to select the research topic?

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What scientific research is…?
(partially based on Stone, 2000)

• Research is an original contribution to knowledge.

• For being recognised by the scientific world, your scientific research should show 3 things:
  1. that you identified one (or more) unanswered scientific question(s)
  2. that you are able to provide the answer(s) to these question(s)
  3. that you have provided these answer(s) on the basis of a robust/convincing methodology!

(=> Supervisors are supposed to provide guidance on the difficulty of the question(s))
What scientific research is…?
(partially based on Stone, 2000)

➔ And, at the end, your scientific research results must be communicated to other scientists. In other words, your research results must be published!

- The PhD thesis
- Papers connected to your PhD thesis
- Papers constituting your PhD thesis

4 main types of PhD thesis

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How to select (or better focusing) the topic of your thesis/research

Main criteria:

• Your personal interests and attitudes (also with respect to 5 types of research... – see next slides)
• Already available information (and sources)
• Contacts
• Funds? Sponsors’ interests?
1. The acquisition and interpretation of new knowledge
   \((\rightarrow \text{direct surveys})\)
   - survey exercises on the market demand for responsible-produced/high quality products
   - survey exercises for assessing the risk for timber coming from illegal logging activities in selected countries

2. The re-organization or re-evaluation of old knowledge in a relevant context
   \((\rightarrow \text{assembly of data bases; comparison-studies; meta-analysis})\)
   - comparison-studies on import-export data of biomasses for analysing discrepancies
   - comparison studies among different standards for responsible management
3. The development, testing and refinement of information-capture methodology
(\textit{elaboration or adaptation of working procedures, creation of new methodology to collect data, ...})

- elaboration of procedures and operational tools for assessing good governance of natural resources at local level

4. The generation of new case studies or manuals with direct or indirect applicability to the understanding of topic (\textit{case studies})

- assessment of the economic value of externalities like biodiversity protection or water quality improvement in rural areas
5. The critical, formal and analytical description of natural resources, production practices or other issues characteristics or their development or management (modelling, software development, ...)

(modelling: The devising or use of abstract or mathematical models to describe how something - such as a process, theory, or system - works)

Exercise (~ 60 min)

- Working in groups: 2-3 students/group
- Read through at least 2 random selected scientific papers (from various issues of scientific Journals distributed in classroom)
- Try and classify each paper according to one or more types of research (= 5 types of research as previously listed).
- Discussion (group by group)
The 5 main types of research

1. The acquisition/interpretation of **new knowledge** (direct survey)
2. The re-organization or re-evaluation of old knowledge in a relevant context (comparison studies, meta-analysis, …)
3. The development, testing and refinement of **information-capture methodology**
4. The generation of **new case-studies or manuals** with direct or indirect applicability to the understanding of the topic
5. The critical, formal and analytical description of natural resources or other issues, or their development or management, including **modelling** and **softwares development**

How to select the topic of your thesis/research  2/2

… still no ideas?

- Try and write abstracts on topics of your interest, collecting a few core papers
- Look at the “future research section” of papers and others (MSc and PhDs thesis, etc.)
- **Rightsize** your dissertation problem

Source: Stone, 2002
The logical framework of a research activity

Once selected the topic... follow the logical framework of doing research

By means of literature review (Davide)

- Background, context, state-of-the-art
  (by means of secondary information: studies, publications, reports, etc.)

Which are the available theories and data? What is already known about the topic?
Some thoughts…
(based on Stone, 2002)

How to perform good research?
No prescriptions… process of doing research is unstructured!

Doing research is a grind!
- Hard to stay motivated in a vacuum… (and writing)!
- Many daily operations: reading papers, writing review of papers, discussing ideas, finding brilliant ideas (and selecting the ones are not worth bothering about…)
- To stay in contact with other students, academics and, above all, supervisors is important

How doing strategic grind…
(based on Stone, 2002)

• Be selective in what you read through
  • scan before reading
  - by reading abstract and conclusions, first!
    - if it still looks interesting, read and read it again
  • summarise the ideas/findings
  • find appropriate conferences (always a risk!!!)
  • ask your supervisors and other academics

By the way… do not worry, it’s normal to feel overwhelmed!
### Once selected the topic...follow the logical framework of doing research 2/3

**Background, context, state-of-the-art**
(by means of secondary information: studies, publications, reports, etc.)

Which are the available theories and data? What is already known about the topic?

**By means of your own thoughts...**

Identification of information gaps with respect to the topic’s state-of-the-art

What is currently lacking to better understand the topic?

Selection of one or few information gaps where to focus on

How can I contribute to improve the knowledge on the topic?

**General objective(s)**
**Specific objectives**

How can I contribute to improve the knowledge on the topic?

### The logical framework of research process 3/3

**Materials and Methodology** (i.e. if direct survey: Sampling, Questionnaire design, Data collection, Follow-up; Data processing)

What theories/methods should I apply to carry out my study? How can I adapt them to my specific objectives?

**Data and information analysis (Results)**

Which are the main results of my research? Which data have I found?

**Discussion**

Which are the main findings of my research - with respect to my objective(s)?

**Conclusion**

Which are the key-aspects to focus on (in conclusions)? Recommendations?
When writing, … please think of the reader(s)  
(based on Stone, 2002)

- Write simple!
- Do not make unreasonable assumptions about your audience
- Examiners (and supervisors!) hate to be made to work hard to understand poorly named sections, organise ideas from your work and wade through bad grammar

The research question(s) and the problem statement
A generic paper/thesis structure

(Source: Stone, 2002 – modified)

Abstract/Introduction
– General introduction
– Summary of the question
– Justification for question
– Birdseye view of the result

Background information
– particularly if you encompasses two or more traditional areas (as often might happens)

A generic paper/thesis structure

Literature review
– State-of-the-art
– Organised by ideas rather than time/author/geography

The problem statement/the research question
(the core/foundation of your research)
– Concise statement of question
– Justification, refer closely to review (analysis)
– Explain why question is worthwhile (applicability)
A key-aspect: the formulation of the research core

In order to carry out a clear, comprehensive, effectiveness research activity and to justify your efforts, 2 points are of paramount importance:

1) clearly formulate the research question(s)

A key-aspect: link the core question to your conclusions

2) clearly link the research question(s) (= the Objective(s)) to the results/findings (= where to focus on the discussion and the conclusion)

‘Originality is proven by thorough review of topic and closely related topics and reference review to demonstrate that question(s) has/have not previously answered and it is worthwhile answering’ (Stone, 2002)
Exercise 2 (~ 60 minutes)

Read through the selected examples of problem statements and related conclusions and/or draft papers.

1. Are they properly formulated, complete and clear?
2. Let's try and correct/improve them.
3. Have the authors been able to provide clear answers to their own research questions? If not, why?

Discussion

Guiding-questions in papers/thesis evaluating …  
(based on Stone, 2002)

• Did the described ideas really work?
• Are there any really interesting idea?
• Which have been the motivations of the author (s)?
• Validity of assumptions?
• Is the methodology clear and robust?
• Which were the results?
• Any future direction?
Exercise 3 (~ 45 min)

The research core/foundation should be (carefully) prepared by developing a research synopsis (RS)

1. Read through the guidelines for RS
2. Read through examples of RS presented by PhD candidates for their selection and find weaknesses/mistakes

Discussion