The Research Question
OR
Doing Valuable Research

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Target Audience; Key Assumptions

Target audience

- Those about to embark on a foundation research project for their career
- Examples: Honours, MSc, first research job at a research institution

Key assumptions

- Aspire to do as good a job as possible
- Undertake a relevant/meaningful project

Health Warning

Participants are warned that you cannot gain meaningful insight into subject matter of this nature simply by listening to a lecture.

Instead, you should workshop your situation with a small group of relevant people.

Never rely entirely on the sole input of some 'guru', especially in connection with practicalities on the ground.

Talk Outline

'Have I got a good study?'

- Defining a research question
- Mandatory: clear conceptual foundation
- Distinguishing good from poor questions

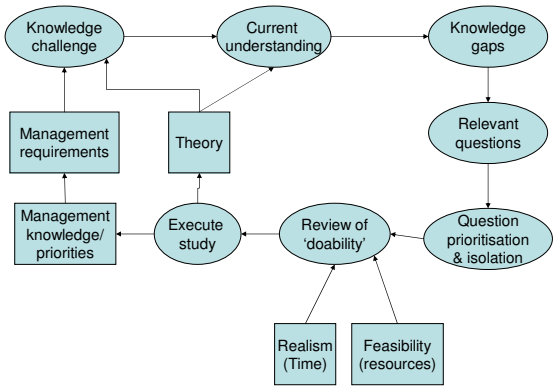
'Can I do this study?'

- Realism and feasibility

'Will it make a difference?'

- Automatically follows from the above

A study circle



Identifying a Research Question

The research question you address will guide the scope and extent of your study

Source

Most people attending this lecture would have a question imposed on them by a supervisor or an institution

You should, however, assess the strength of the proposed study in terms of the features and conditions of the question

- Eg – specific versus vague questions
- Eg - exploratory versus focused studies
- Eg – sound conceptual foundation or not

Gaining a sound conceptual foundation

READ

READ SOME MORE

AND THEN EVEN SOME MORE

REMEMBER AND SYNTHESISE WHAT YOU HAVE READ

End product

- A set of meaningful hypotheses that capture current knowledge
- A set of focused and specific questions

Some Common Traps 1

For postgraduate studies which are part of a larger research initiative:

The bigger question(s) addressed by the larger programme may be good

BUT

Your specific component is a cog that does not stand well on its own

Some Common Traps 2

Your pet project

BUT

NOT your supervisors pet project

Group Review of Projects

Projects within Group: 'Effect of'

Q: Assessing the impacts of invasive alien plants (*Acacia mearnsii*) on rangeland productivity and livestock production

Aim: compare impacts from different levels of invasion (un-invaded, lightly invaded, heavily invaded, invaded and cleared)

Assess:

Vegetation – species composition
- biomass production

Soils - water infiltration rate
- organic component

(MSc; 3 mo data collection)

Projects within Group: 'Effect of'

Q: Effects of grazing densities (Dorper sheep) on veld diversity, in the Klein Karoo bordering Outeniqua.

M Tech

Projects within Group: 'Effect of'

Q:Effect of long-term fire treatments (annual burn vs no burn) on soil hydraulic properties, soil water balance and nutrients (particularly organic matter)

(MSc 1 yr data collection)

Projects within Group: Soils

Can the addition of organic residues (compost or kraal manure) ameliorate soil acidity and increase crop yield for resource poor farmers?

(3 years)

Projects within Group: Soils

Does addition of Gromor compost reduce nitrogen leaching in sandy soils?

(3 years)

Projects within Group: Soils

Are there any detrimental effects between low rainfall and compost application?

(Diploma Agric; 3 years)

Projects within Group: Soils

Can the establishment of self-perpetuating grazing lawns on nutrient-poor soils increase the ecological carrying capacity of the veld/reserve?

(5 yrs plus data collection)

Projects within Group: Economics

Q: The economic value of ecosystems of protected areas (using TEEB method)

(MSc; >10 years)

Projects within Group: Economics

Q1: Is commersialisation of livestock possible under communal land use?

(Community engagement; 4 weeks)

Projects within Group: Mgmt for resource poor

Q: Marketing of indigenous crops and information flow to the resource-poor farmers based on their literacy level.

(M Agric Mgmt; 3 years)

Projects within Group: Mgmt for resource poor

Q: Farmers' perceptions, Nguni cattle, feeding behaviour and dynamics of the communal resource base.

(Masters, 1 year)

Projects within Group: Mgmt for resource poor

Q: Can make difference between grass species in wetlands and in dry land, even on slopes or hills

(Dip Agric; 2/5 years)

Queries from group

1. What if your methodology does not lead to your objectives or goal that you were aiming to achieve?

(MSc; 31 years data)

Queries from group

- A) Is there some sort of guide line to help one with the outlay of a truth?
- B) What do you do if there is a lack of theory on a specific topic?

(M Tech; 2.5 years)

Queries from group

- What methods do you use to monitor vegetation change?

(1 year)

A good question does not mean you will have a good study

‘Can I do this study?’

The two most common external causes of studies not achieving a desired quality:

Not enough time to get the data or do the analyses required for the study

Insufficient resources in the field or the lab to do the work properly and thoroughly

Golden Rule

A post-graduate needs to showcase their ability

A good question needs a:
- sound study design
- decent sample size
- a sound analysis

Beware of glamorous projects:
Example:
What sample size do you think a field study of:
“Vocalisation during foreplay of mountain gorillas”
will deliver?

OVER-AMBITIOUS

=

UNDER-ACHIEVEMENT

Some Common Traps 3

- Studies that cannot be answered in the short-term
- eg influence of rainfall variability on vegetation dynamics

(“Your work will set the foundation for a long-term study”

MAYBE

but its also a large part of the hole for your own grave.)

Some Common Traps 4

- It is an amazing field or greenhouse experiment whose treatments have to be maintained on an ongoing basis
- BUT
- Everything goes wrong on the weekend you are away

Good question, good resources, lots of data but poor data

Any question is unique to a degree.

Approach and methods should therefore be defined to meet the specific requirements of that question

Beware of accepting general approaches

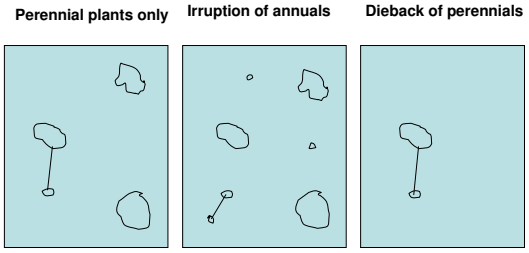
Expect contradictions amongst the ‘learned’ about the most appropriate methods

Example of an inappropriate approach

- Sampling methods must be directly related to the question at hand
- A common mistake is to use a well known method designed for an alternative purpose
- Using veld survey as an example. Veld composition is commonly surveyed using a nearest plant sample of 200 points
- It is an efficient technique for general description of veld composition
- Is it appropriate for specific questions about veld changes?

Question: Is the abundance of a key forage plant being maintained under a specific grazing regime?

Approach: 200-point veld survey of nearest plant
Approach is based on a relative and not on an absolute measure



Method seems OK – nearest perennial plant measured

Perennials unchanged but shorter-lived component is measured

Dramatic decline in absolute abundance not well detected

Some Common Traps 5

"It will be so exciting to determine the population changes of this cryptic animal species. We cannot count numbers so we will use an indirect index of abundance"

BUT

One that has never been properly calibrated so the data make no sense.

Moral: The measures must be appropriate.

Take Home Rules 1

Does your study show the following:

- Good questions
- Grounded in a sound conceptual basis
- Realistic time frame
- Feasible
- Study maintains value if the scope is trimmed
- Sound study design and data collection

Take Home Rules 2

If your heart does not feel it then do not do it simply for the sake of obtaining a higher qualification