Selecting a Research Problem

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More Factors make the project "outstanding"…

- First, it must ask questions.

- Second, if possible, the project should have the potential to yield a seminal observation.

What do we do with Problems?

- Ignore them
- Talk about them
- Try to solve them

What is a Research Problem?

- It is a problem that someone would like to investigate.
- It is considered a situation that needs to be changed or addressed.
- In educational research, the research problem is typically posed as a question.

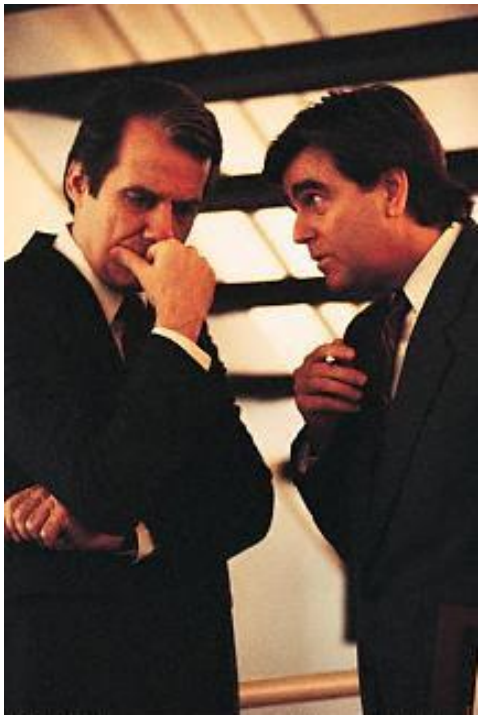
Examples

- Drugs used as cancer treatment.
- Current treatment used to destroyed cancerous cells.
- Awareness of Saudi population toward the a obesity

Problem!

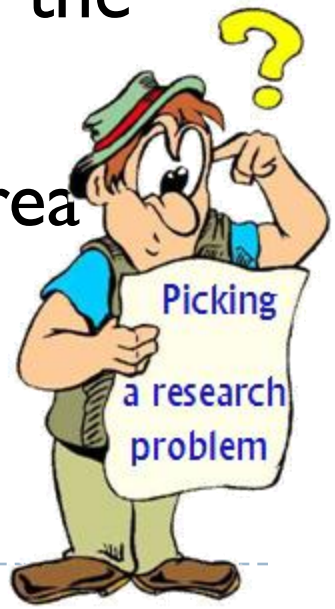
- Choosing good problems is essential for being a good scientist.

- what is a good problem, and how to choose one?



Picking a research problem..

- You should have a *personal interest* in the topic.
- Pick a topic that you already have some expertise about.
- Pick an area on the basis of the interest of the outcome.
- Go to talk and read papers outside your area of interest.



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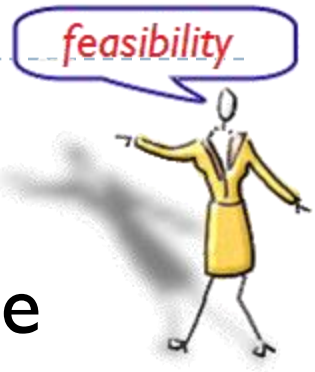
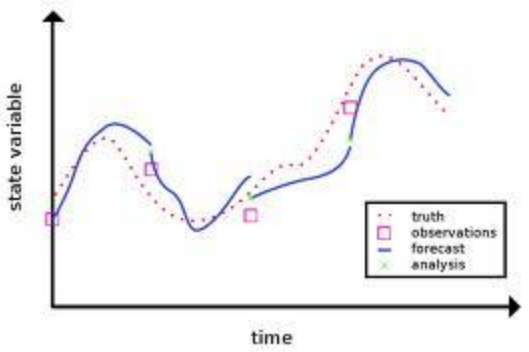
- Anticipate the results before doing the first study.
- Choose research that is unique.
- Think Carefully before you choose a controversial topic.
- Pick a manageable topic.
- Read, listen, discuss and think critically.
- Focus, Focus, Focus.

We will compare problems by imagining two axes:



I. The first is *feasibility* ….

This axis is a function of the skills of the researchers and of the technology in the lab.



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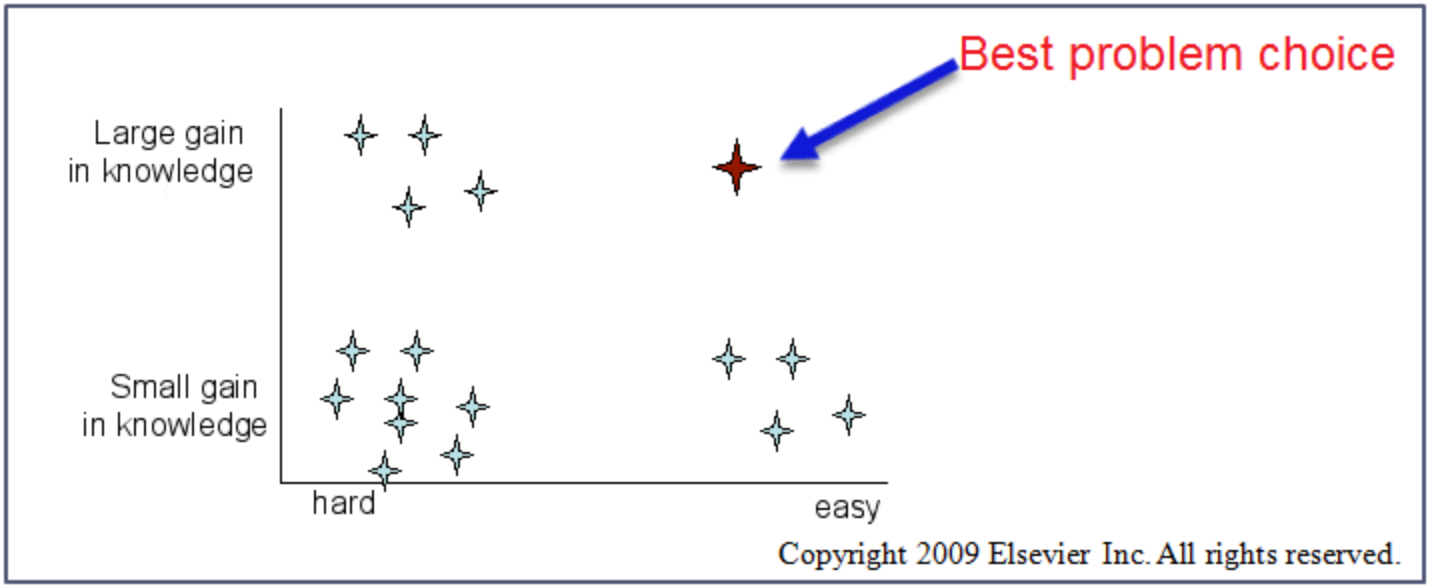
II. The second axis is *interest*:

The increase in knowledge expected from the project.

Problem can rank in term of ease and interest



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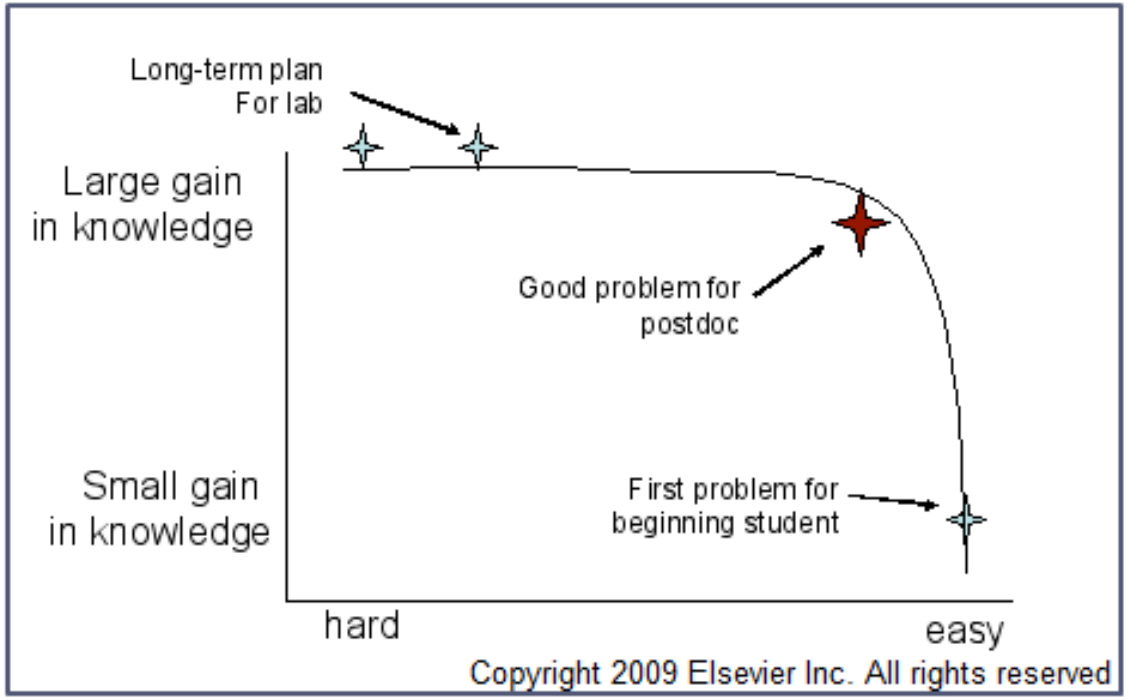
- To decide which problem to select along the front depends on how we weigh the two axes.

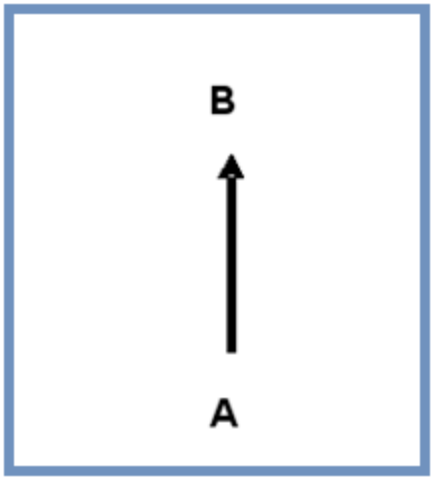
Choice of problem along the pareto front moves with life stages of scientst



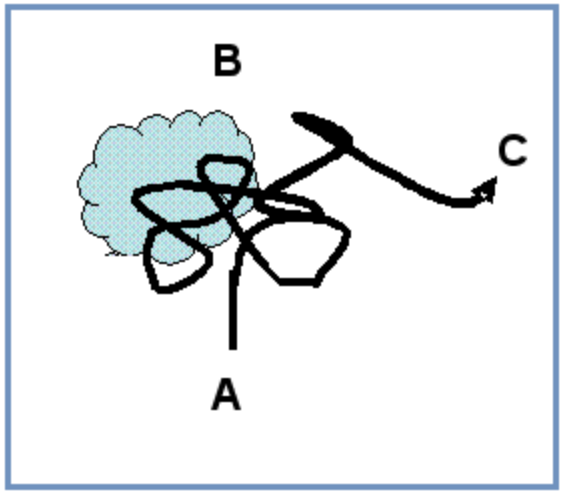
The schema of research

- A common schema is expressed in the way papers are written: one starts at point A, which is the question, and proceeds by the shortest path to point B, the answer.

The objective schema can lead to frustration when the project goes off track



The nurturing schema of scientific research gives support and opens new directions



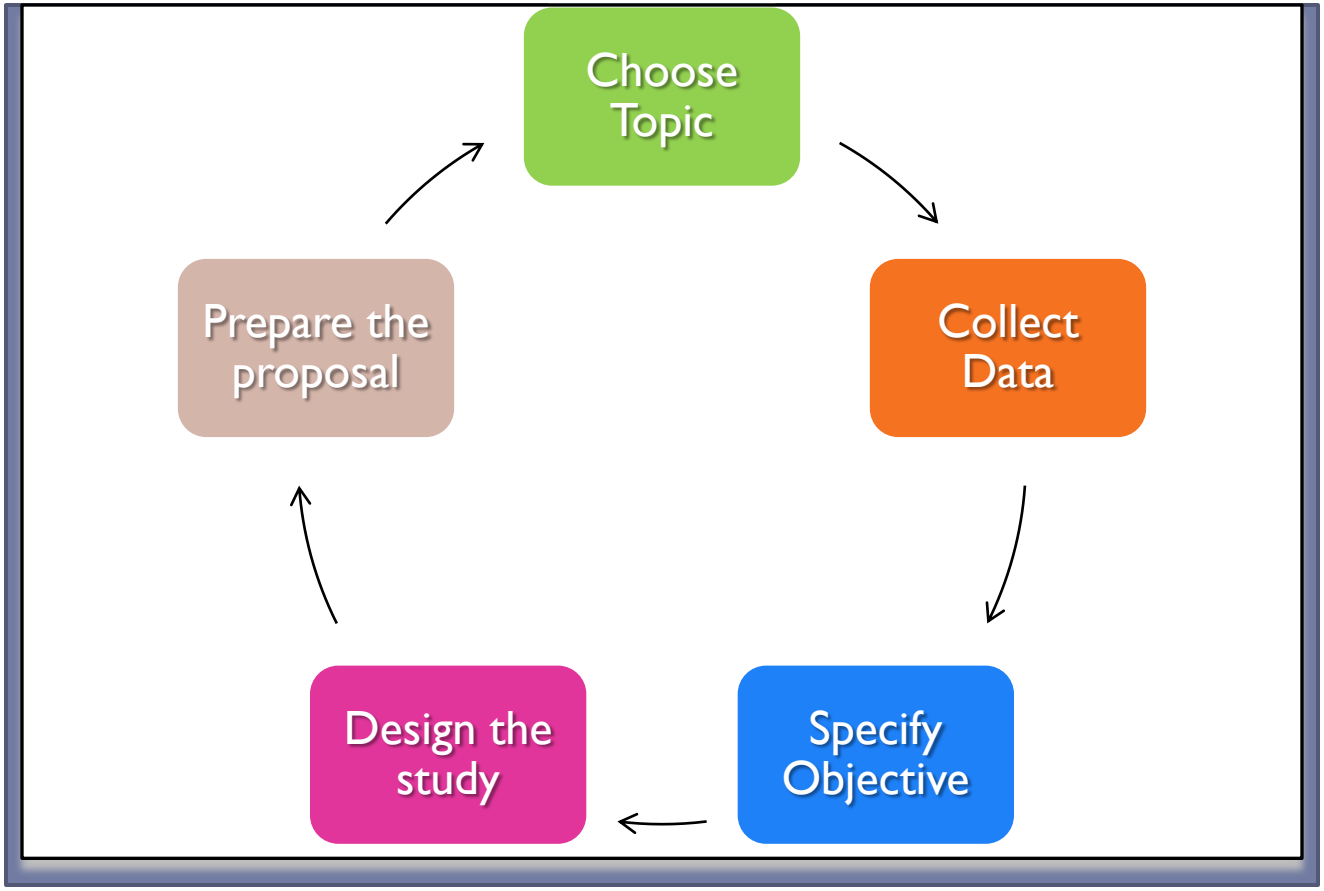
Refining the Topic

- The topic has to be "sized"!
  - Generally this means reducing the scope of the topic, occasionally it might be expanded.
  - Graduate students often select topics that are too broad.

Refining the Topic

- The topic has to be "clarified"!
  - The topic needs to reworded so that it states clearly and unambiguously the matter to be investigated, the variables to be investigated, and participants, if any, that will be involved.

The Research Process



The Research Proposal/Report

- For graduate students, the research proposal is presented to your committee for their approval **before** you conduct the research and

- The research proposal is typically presented to a funding agency, for approval/funding.

References

- Uri Alon (2009). **How to choose a good scientific problem?** Molecular Cell, Vol. 35, Issue 6, 726-728.

- Robert Harris (1998). **Introduction to Problem Solving.**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