

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 problem?



- Any situation where a gap exists between the actual and the desired state.
- A problem does not necessarily mean that something is seriously wrong.
- It could simply indicate an interest in improving an existing situation.
- Thus, problem definitions can include both existing problems in the current situation as well as the quest for idealistic states in the future.

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.



Problem Identification



1. **Observation** –researcher senses that changes are occurring, or that some new behaviors, communication patterns, etc., are surfacing in one’s environment. The researchers may not understand exactly what is happening, but can definitely sense that things are not what they should be.
2. **Preliminary Data Collection** – use of interviews, both unstructured and structured, to get an idea or “feel” for what is happening in the situation.
3. **Literature Survey** – a comprehensive review of the published and unpublished work from secondary sources of data in the areas related to the problem.



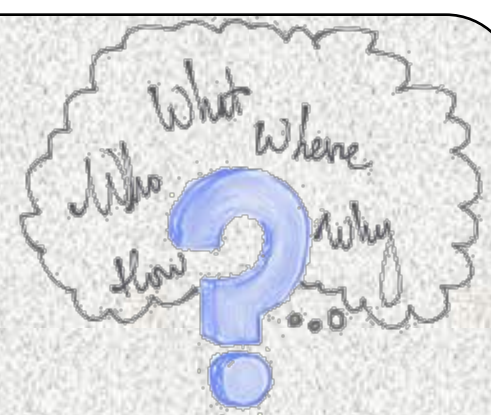
Examples:



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



Problem!

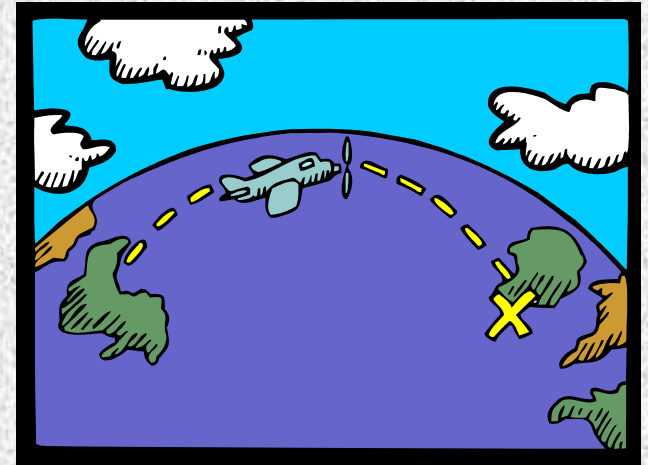


- ▶ Choosing good problems is essential for being a good scientist.
- ▶ what is a good problem, and how to choose one?



Your research will take you on a journey to find out:

- What is already known
- What is still unknown
- What is worth knowing
- What is knowable
- What is the best way of designing a study in order to find answers to what is: Unknown, Worth knowing and Knowable

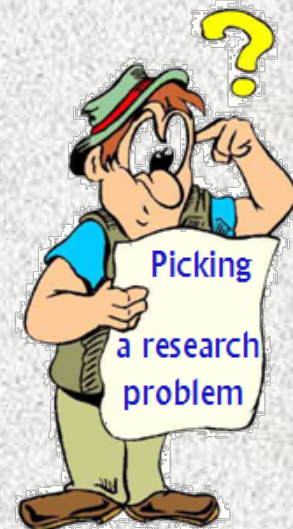


Picking a research problem..

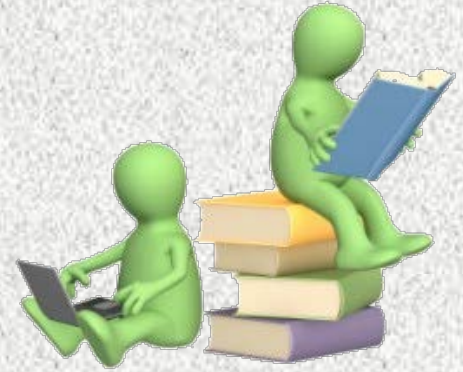


I'm fedup

- 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.



Continue...



- 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.



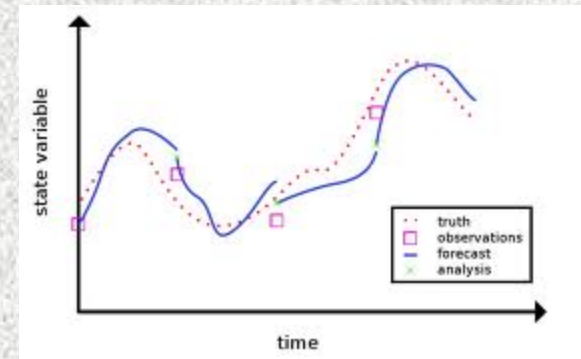
We will compare problems by imagining two axes:

feasibility



I. The first is *feasibility*

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



interest

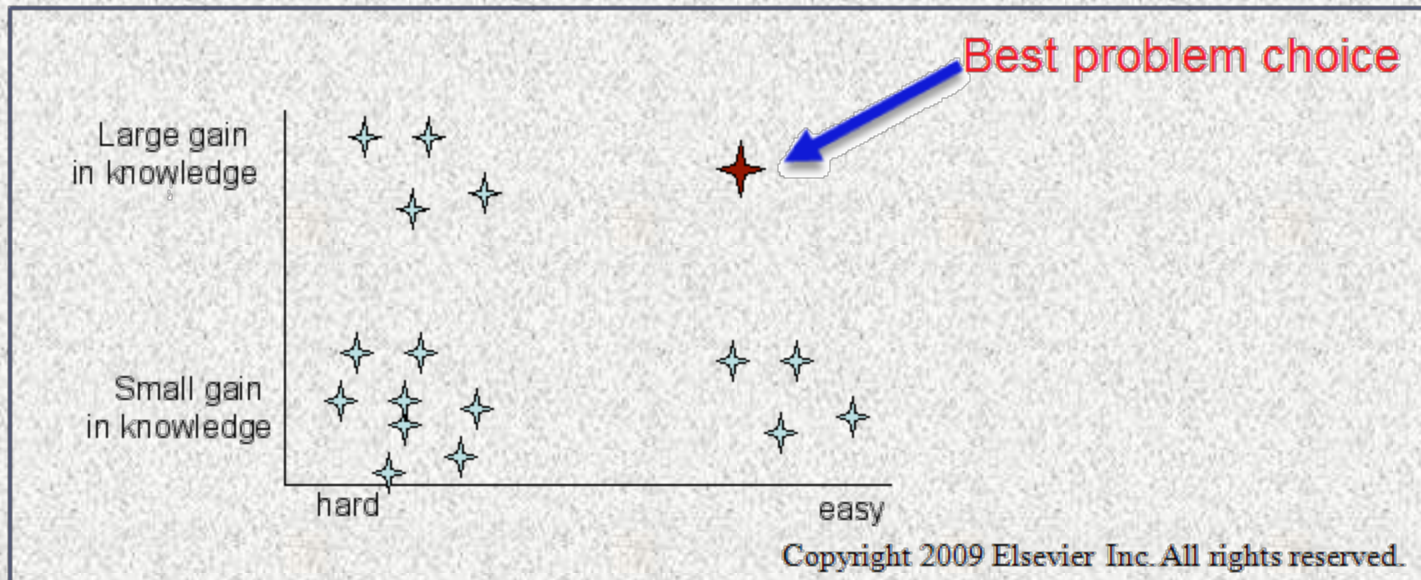
Continue...

II. The second axis is *interest*:

The increase in knowledge expected from the project.



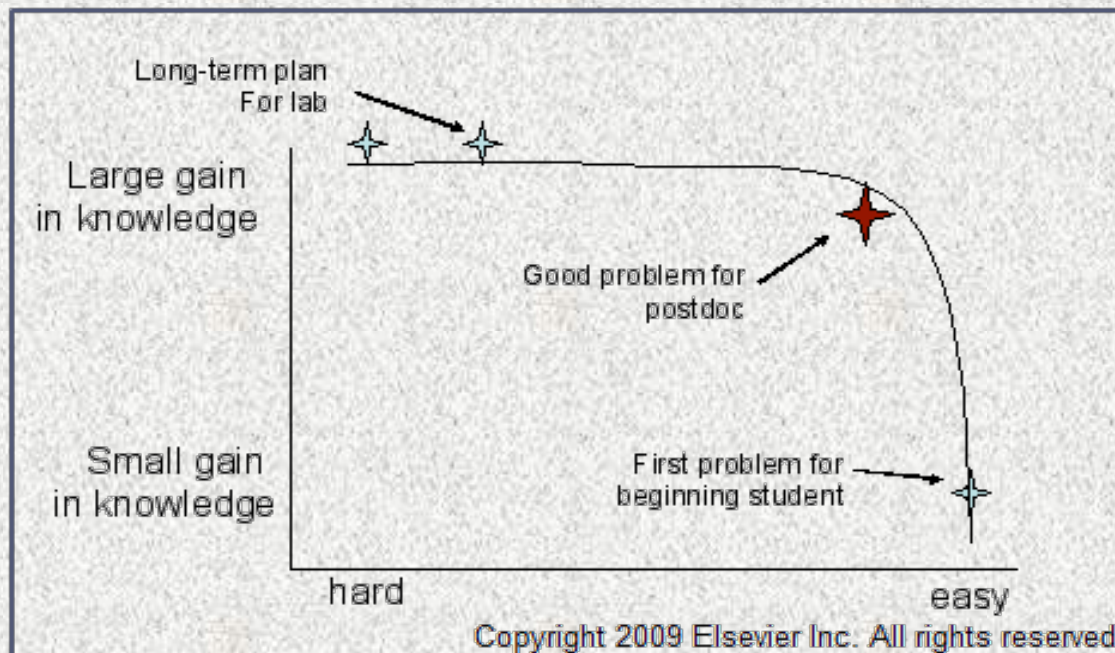
Problem can rank in term of ease and interest



Continue...

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

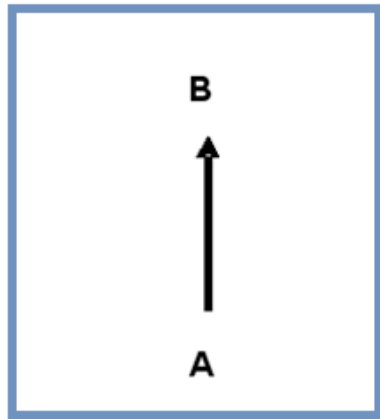
Choice of problem along the pareto front moves with life stages of scientist



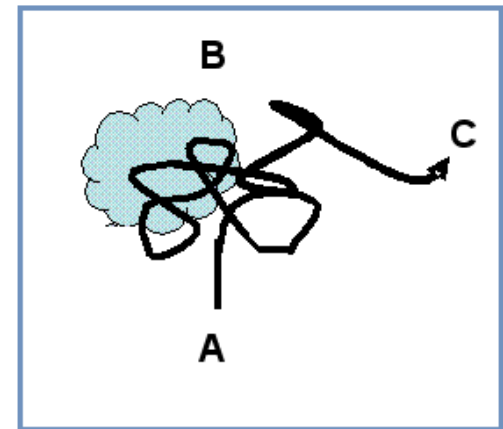
The schema of research

- 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.



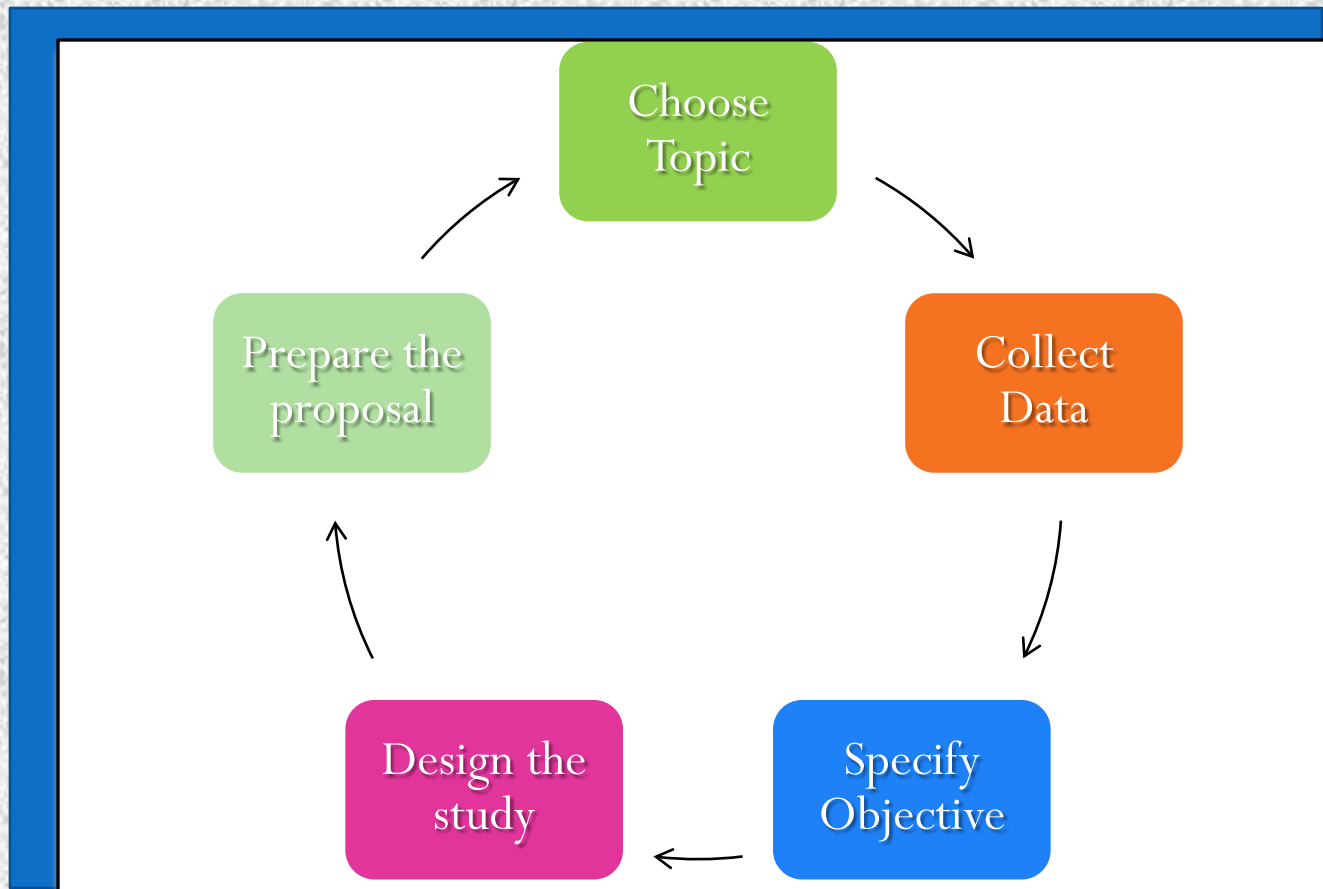
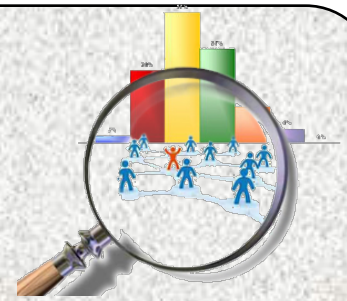
Refining the Topic



- The topic has to be “clarified”!
- The topic needs to be 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.**

thank you!

