FORHEAL: Forestry Higher Education Advancement in Laos (Erasmus+)
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Scientific process

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Scientific research

- A process of rigorous reasoning based on interactions among theories methods, and findings
- Builds on understanding derived from the objective testing of models or theories
- Accumulation of scientific knowledge is laborious, plodding, circuitous, and indirect
- Scientific knowledge is developed and improved through critique contested findings, replication, and convergence
- Scientific research must be guided by fundamental principles
  - -> USES SCIENTIFIC METHODS

Basic Elements of the Scientific Methods

Scientific method refers to a standardized set of techniques for building scientific knowledge, such as how to make valid observations, how to interpret results, and how to generalize those results

Basic Elements of the Scientific Methods

Scientific method refers to a standardized set of techniques…..

1. Building scientific knowledge
2. How to make valid observations
3. How to interpret results
4. How to generalize those results

Basic Elements of the Scientific Methods

Scientific method refers to a standardized set of techniques

- Building scientific knowledge
  - Documenting and communicating the findings
- How to make valid observations
  - Replicability, reliability
- How to interpret results
  - Evidence
  - Interference
- How to generalize those results
  - Links to other research

Scientific Method

- Make an Observation
- Ask a question (formulate research questions)
- Research
  - Form or construct a Hypothesis
  - Experiment (Test the Hypothesis)
  - Analyze the Data
- Draw a Conclusion
- Communicate Results

"Traditional approach"

Basic Elements of the Scientific Methods

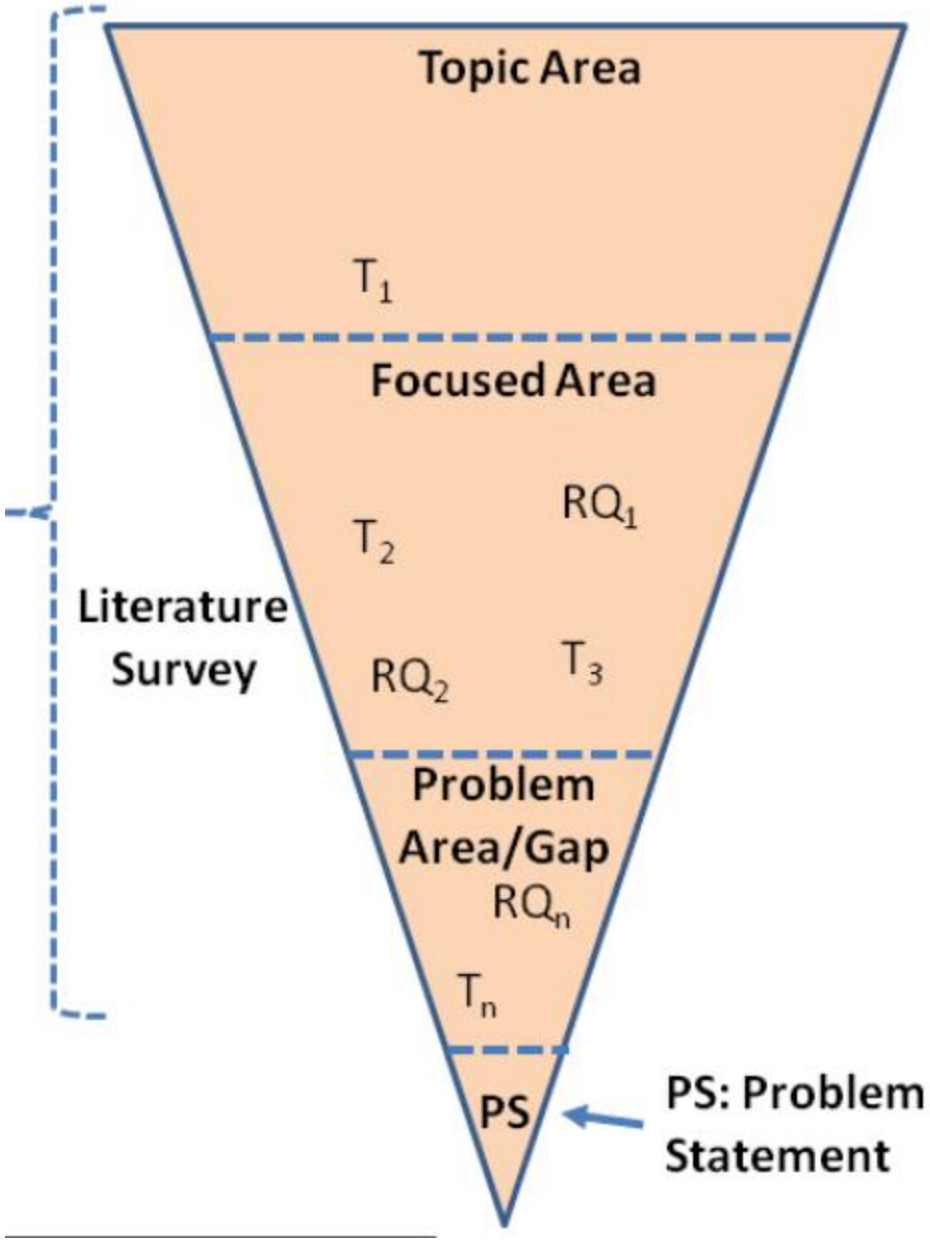
1. Replicability	**Replicate or repeat a scientific study and obtain similar, if not identical, results.**
2. Precision	Theoretical concepts that are to be defined so that others can use those definitions to measure those concepts and test that theory
3. Falsifiability	Theories that cannot be tested or falsified are not scientific theories and any such knowledge is not scientific knowledge.
4. Parsimony	When there are multiple explanations of a phenomenon, scientists must always accept the simplest or logically most economical explanation.

Problem statement

- Problem statement emerges from literature survey
  - Terminologies (T_1, T_2…..T_n) and concepts from the literature
  - Abstract research questions (RQ_1, RQ_2…..RQ_n) from the literature

- Problem statement is a concise statement – not a question

- Problem statement specifies problem or gap



Research questions

Research question: It is the question to be addressed using data collected

- ***Functions:***
  - It drives the study
  - Informs research approach
  - Informs data collection and analysis process

Tangkuban Perahu, Java, Indonesia. Photo: M. Kanninen

Thank you

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