

# Research Methodology

Defining Research Problem



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# 1) Defining Research Problem

# What is a research problem?

- **Creswell** [1] defined a research problem as
  - “an educational **issue** or **concern** that an investigator presents and justifies in a **research study**.”
- [2] Research problem means:
  - “Some **difficulty** which a researcher experiences in the context of either a theoretical or practical situation and wants to **obtain a solution** for the same.” or
  - “A research problem is one which requires a researcher to find out the **best solution** for the given problem, to find out by which the objective can be achieved **optimally** in the context of a given environment.”

# Components of a Research Problem

- 5 components of a research problem [3]. There must
  - 1) Be an **individual** or a **group** which has some **difficulty** or the **problem**
  - 2) Be some **objective(s)** to be attained at
  - 3) Be **alternative means** (or the courses of action) for obtaining the objective(s) one wishes to attain
  - 4) Remain some **doubt** in the mind of a researcher about the selection of alternatives
  - 5) Be some **environment(s)** to which the difficulty pertains (or relates)

# Why the research problem is important?

- Research problem is important because it
  - Establishes the importance of the topic
  - Creates reader interest
  - Focuses the reader's attention on how the study will add to the literature

# Sources of Research Problem



# Sources of Research Problem

- Personal experience
  - Day to **day** personal experience of a research
  - Ex. We observe that blind people can't see, but can read
- Practical experience
  - From **everyday** practical work
- Critical appraisal of literature
  - When we critical study book and articles of our **interest subject**
    - Including articles, research reports, opinion articles, etc.
  - This information may serve as a basic to formulate a research problem



# Sources of Research Problem

- Previous experience
  - Normally at the **end of research** study, further research problems are **found** or **suggested**
- Existing theories
  - May **apply** theories from other disciplines to our research
  - Ex. Apply optical character recognition methods in English to Khmer
- Social issues
  - Sometime, topics are identified from more global contemporary **social** or **political issues**
  - Ex. Traffic jam, old people with poor vision can't read

# Sources of Research Problem

- Brainstorming
  - Brainstorming sessions among **interested people** of the profession
    - Are good techniques to find new research questions
- Intuition
  - Reflective **mind** is a good of ideas
    - It can be used to generate a good research problem
- Folklores
  - Common **believe** may be **right** or **wrong**
  - Ex. It is believed that studying just before the test decreases score

# Sources of Research Problem

- Exposure to field situations
  - During field exposure, we get **variety of experiences**
    - Might provide a lot of ideas to formulate research problems
- Consultation with experts
  - Experts are people with **wise knowledge** in their respective field
    - May suggest a significant research problem
  - Experts may help in finding a **current problem** in the studying discipline

# Selecting the Research Problem

- Some points to consider when selecting a research problem [2]:
  - Subject which is **overdone** should not be normally chosen, for it will be a difficult task to throw any new light in such a case
  - **Controversial** subject shouldn't become choice of an avg. researcher
  - **Too narrow** or **too vague** problems should be avoided
  - The subject selected for research should be **familiar** and **feasible**
  - The **importance** of the subject, the **qualifications** and the training of a researcher, the **cost** involved, and the **time** factor should be considered
  - The selection of a problem should be preceded by a **preliminary study**

# Selecting the Research Problem

- **Criteria** for selecting a good research problem [4]:
  - **Significant**: usage benefit, important, solve current problem
  - **Original**: new and unique in itself
  - **Feasible**: time, availability of subjects, facilities, equipment & supplies, money, administrative support, peer support, researcher's skill
  - **Researchable/solvable**: insolvable research problem should be reduced
  - **Current**: based on the current problem
  - **Interesting**: an accordance with researcher's field of interest

# Technique to Define a Research Problem

State the problem in a general way



Seek to understand the nature of the problem



Survey the available literature



Develop ideas



Rephrasing the research problem

# Technique to Define a Research Problem

- The formulation of a research problem should fulfill features:
  - They are **clear, precise**
  - They **state** the variables, population, research setting under study
  - Type of study might also be included in the **statement of research problem** (could be in declarative or interrogative format)
    - Ex. Survey, discussion

## 2) Defining Research Question



# What is a Research Question?

- Research question is a question which the research **sets out to answer** [5].
- Research question should
  - Deal with a **topic/research problem**
  - Be **fully researchable**
  - Not be **too narrow, too broad, or too challenging**

# What is a Research Question?

- **Research problem**

- How **ontology** can be used to **improve** the **semantic** search result?

- **Research question**

- How to **populate** the ontology?
- How to **calculate** the similarity score between two words by using ontology?

# Why Research Question?

- The research question is the starting point of the study
  - It shapes the topic into **reachable** variables
  - It adds focus to the problem statement and guide the research work
  - It helps determine
    - The **population** to be studied
    - The **setting** for the study
    - The **data** to be collected
    - The **time** period for the study

# 3) Defining Research Objective

# What is a Research Objective?

- It defines the expected results/outcomes of a research study
- Research objective should be
  - Clear
  - Achievable and verifiable
- Usually, objectives begin with
  - Discover ...
  - Determine ...
  - Establish ...
  - Identify ...
  - Compare ...
  - Analyze ...

# References

- [1] Creswell, John W. "Educational research: Planning, conducting, and evaluating quantitative." New Jersey: Upper Saddle River (2002).
- [2] Kothari, Chakravanti Rajagopalachari. Research methodology: Methods and techniques. New Age International, 2004, (Second Revised Edition).
- [3] R.L. Ackoff, The Design of Social Research, Chicago University Press, Chicago, 1961.
- [4] Jayesh Patidar, "Research problem", slide material
- [5] M.C. Masatu, Research question, slide material