ALMUSTAQBAL UNIVERSITY

College of Health and Medical Techniques
Medical Laboratory Techniques Department

Stage : Fourth year students
Subject : Research Methods - Lecture 7

Lecturers:

Professor Dr Mahdi A. Abed

Assistant professor Dr. SADIQ . J. BAQIR

Research Problem Formation

I. Introduction: Why the Problem is very important ?

The research problem is the foundational bedrock upon which the entire research project rests. Get this wrong, and the whole structure – no matter how elegant the methods or sophisticated the analysis – risks collapsing".

A well-formulated research problem is the compass that guides every subsequent decision:

- **What literature** do you review?
- **What methodology** do you choose?
- **What data** do you collect?
- **How do you analyze** that data?
- **What conclusions** can you draw?

A weak(poor) problem leads to weak answers while a precise, well-articulated problem paves the way for a significant and valid contribution to knowledge.

The good Problem Defines many things:

1. It determines the research questions
2. guides the literature review
3. dictates the methodology
4. shapes the data analysis
5. and ultimately defines the significance of the contribution.

The Poor Problem comprises:

1. Wasted time, resources, and effort
2. difficulty in securing funding /publication
3. findings that lack impact or relevance
4. research that fails to advance knowledge meaningfully.

II. **Defining the Research Problem** :

Core Definition:

A research problem is a specific issue, difficulty, contradiction, gap in understanding, or unanswered question within a field of knowledge that points to the need for meaningful understanding and a directed investigation.

Characteristics:

1.It Identifies what is not known or not well understood.

2. Has potential implications for theory, practice, policy, or society.

3. Can be investigated through systematic, empirical inquiry (data collection and analysis).

4.It is Precise enough to guide the research process.

5 . Can be studied within available resources (time, money, expertise, access) .

III. Sources of Research Problems

1.The Literature (The Most Common Source):

2. Gaps: "While much is known about X, little research has examined Y within the context of Z".

3. Contradictions: "Study A found X, but Study B found Y. What explains this discrepancy"?

4. Unexplored Areas: "The application of Theory X to Phenomenon Y has not been investigated".

5. New Methods/Technologies: "Can Method X, recently developed in Field A, be effectively applied to Problem Y in Field B"?

What is a "Gap"?

- An unanswered question.
- An untested theory in a new context.
- A contradictory finding that needs resolution.
- A new phenomenon that hasn't been studied (e.g., the impact of a new technology).

- An old problem that requires a new methodological approach.
- The "gap" is the space where your research will live.

identification of a gap.

- **Practice Gap:**

  A problem facing professionals (e.g., poor adoption of a new technology).

- **Knowledge Gap:**

  the answer to a specific question (e.g., What is the impact of X on Y?) is not known.

- **Literature/Theory Gap:**

  Existing research is contradictory or a known theory doesn't explain a specific phenomenon.

Practical Experience & Professional Contexts:

Problems encountered in the workplace, in clinical settings, in community engagement.

Theory:

Testing theoretical predictions, exploring boundary conditions of a theory, integrating different theories, identifying limitations in existing theoretical frameworks.

Personal Curiosity & Observation:

A puzzling phenomenon you've observed, a question sparked by a documentary or news article, a personal experience that raises a broader question. Link this to existing knowledge to demonstrate its scholarly relevance.

Replication & Extension:

Replicating studies in new contexts/populations or extending previous findings.

IV. Evaluating Potential Problems: Key Criteria

Not every idea makes a good research problem. Apply these filters:

1.Significance ("So What?")

a. ***Theoritical***: Does it fill a gap, resolve a contradiction, extend/refine a theory?

b. ***Practical***: Does it have implications for improving practices, policies, interventions, products, or well-being?

c.***Methodological***: Does it develop or refine research techniques?

2. Researchability:

Can it be transformed into specific, answerable research questions?

Are appropriate methods and data sources available?

3.Feasibility:

a. ***Resources*** : Time, funding, expertise, equipment, access to participants/data.

b. ***Scope***: Is it narrow enough to be manageable within constraints?

c. ***Ethics*** : Can it be studied ethically?

4. Clarity & Specificity:

Is the problem precisely defined? Avoid ambiguity.

Who/what/where/when? (Context matters!).

5. Novelty/Originality:

Does it offer a new perspective, examine a new context, use a new method, or combine ideas in a novel way? (should add value).

Criteria for a Good Research Problem

How do you know if you have a **good** research problem? Use these two checklists:

1. **The FINER Criteria (General Applicability)**

Criterion	Question to Ask Yourself
Feasible	Do I have the time, resources, skills, and access to data to conduct the study?
Interesting	Am I genuinely interested in it? Will it keep me motivated?
Novel	Does it confirm, refute, or extend previous findings? (It must contribute new knowledge.)
Ethical	Does the study treat human and animal subjects justly? Can I get institutional approval?
Relevant	Will the findings has matter to practitioners, or future researchers?

2. **PICOT Framework (Especially for Quantitative & Clinical Studies)**

Element	Description
Population	Who is the study group? (e.g., Adults with Type 2 Diabetes)
Intervention	What is the action/exposure being studied? (e.g., A new mobile health app)
Comparison	What is the control group or standard approach? (e.g., Standard care/no app)
Outcome	What are you measuring? (e.g., Reduction in HbA1c levels)
Time	The duration of the intervention or observation (e.g., Over a 6-month period)

V. Formulating the Problem Statement

This is the written expression of the research problem.

Key Elements:

1. Briefly establish the broader area and its importance.

2. Clearly state what is unknown, poorly understood, or problematic.

3. Explain why this gap/issue matters (its significance and Consequences) .
4.The Proposed Focus: State specifically what aspect of the gap/issue this particular study will address.

Characteristics of a Good Statement:

a. Concise (1-3 paragraphs max).

b. Clear, unambiguous language.

c. Focused and specific
d. Justified (significance is clear).

e. Leads logically to research questions.

Common Pitfalls:

Too Broad: "Studying the effects of social media.(What effects? On whom?)

Too un clear: "Understanding teacher experiences." (Which teachers? What kind of experiences?)

Solution-Oriented: Starts with proposing a solution before defining the problem.

Lacks Significance: Doesn't explain why the problem matters..

VIII. Conclusion

Research problem formation is the critical first step, defining the foundation of your inquiry. It identifies a specific gap, issue, or contradiction that is significant, researchable, and feasible.

Sources are Everywhere: Literature, practice, theory, society, and personal curiosity.

Evaluation is: Apply Significance, Researchability, Feasibility, Clarity, and Originality filters. the Statement: Be concise, clear, focused, and justify the problem's importance