

Understanding the Research Process

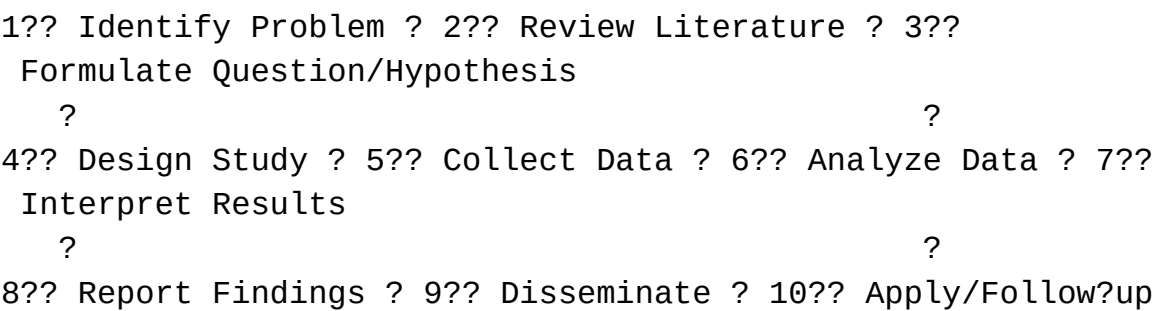
Understanding the Research Process

Key concepts, steps, and best-practice tips for conducting rigorous research.

1. What Is Research?

Aspect	Description
Definition	A systematic, evidence-based inquiry aimed at generating new knowledge or solving a specific problem.
Purpose	• Test hypotheses • Explore unknown phenomena • Inform policy or practice • Contribute to scholarly discourse • Basic (Fundamental) Research – expands theoretical understanding. • Applied Research – addresses practical problems.
Types	• Qualitative – explores meanings, experiences, and contexts. • Quantitative – measures variables and tests relationships. • Mixed-Methods – integrates qualitative and quantitative approaches.

2. The Research Cycle (Iterative)



Each stage may loop back (e.g., new literature emerges during analysis).

3. Detailed Steps

3.1. Identify and Define the Problem

Understanding the Research Process

- **Observe** a gap, inconsistency, or need.
- **Clarify** scope: population, setting, timeframe.
- **Check feasibility** (resources, time, expertise).

3.2. Conduct a Literature Review

Action	Tips
Search databases (e.g., PubMed, Scopus, Web of Science)	Use Boolean operators, synonyms, and citation chaining.
Evaluate sources	Prioritize peer-reviewed, recent, and methodologically sound studies.
Synthesize findings	Summarize themes, contradictions, and gaps.
Document references	Use a reference manager (Zotero, EndNote, Mendeley).

3.3. Formulate Research Question & Hypotheses

- **SMART criteria** – Specific, Measurable, Achievable, Relevant, Time-bound.
- **Question types** – Descriptive, Comparative, Causal, Exploratory.
- **Hypothesis** (quantitative) – A testable statement predicting a relationship.

3.4. Choose a Research Design

Design	When to Use	Key Features
Experimental	Testing causal effects	Randomization, control group, manipulation of independent variable.
Quasi-experimental	Field settings where randomization is impossible	Matching, pre-test/post-test, nonequivalent groups.
Cross-sectional Survey	Snapshot of a population	One-time data collection, prevalence estimates.
Longitudinal Study	Change over time	Repeated measures, cohort tracking.
Case Study	In-depth exploration of a single case	Rich qualitative data, contextual analysis.

Understanding the Research Process

Design

When to Use

Key Features

Mixed?Methods

Need both depth and breadth

Sequential or concurrent integration of qualitative & quantitative data.

3.5. Develop a Methodology

- **Sampling** – Define population, sampling frame, technique (probability vs. non?probability), sample size (power analysis for quantitative work).
- **Data collection tools** – Surveys, interviews, observation protocols, instruments, sensors.
- **Ethical considerations** – Informed consent, confidentiality, Institutional Review Board (IRB) approval