

# Research Methodology

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## In this lecture

- What Research Is Not
- What Research Is
- Nature and Tools of Research

# Definition

## What Research Is Not

- Accidental Discovery
  - Accidental discovery may occur in structured research process
  - Usually takes the form of a phenomenon not previously noticed
  - May lead to a structured research process to verify or understand the observation

# Definition

## What Research Is Not

- Data Collection
  - An intermediate step to gain reliable knowledge
  - Collecting reliable data is part of the research process

# Definition

## What Research Is Not

- Searching out published research results in libraries (or the Internet)
  - This is an important early step of research
  - The research process always includes synthesis and analysis
  - But, **just reviewing of literature is not research**

# Definition

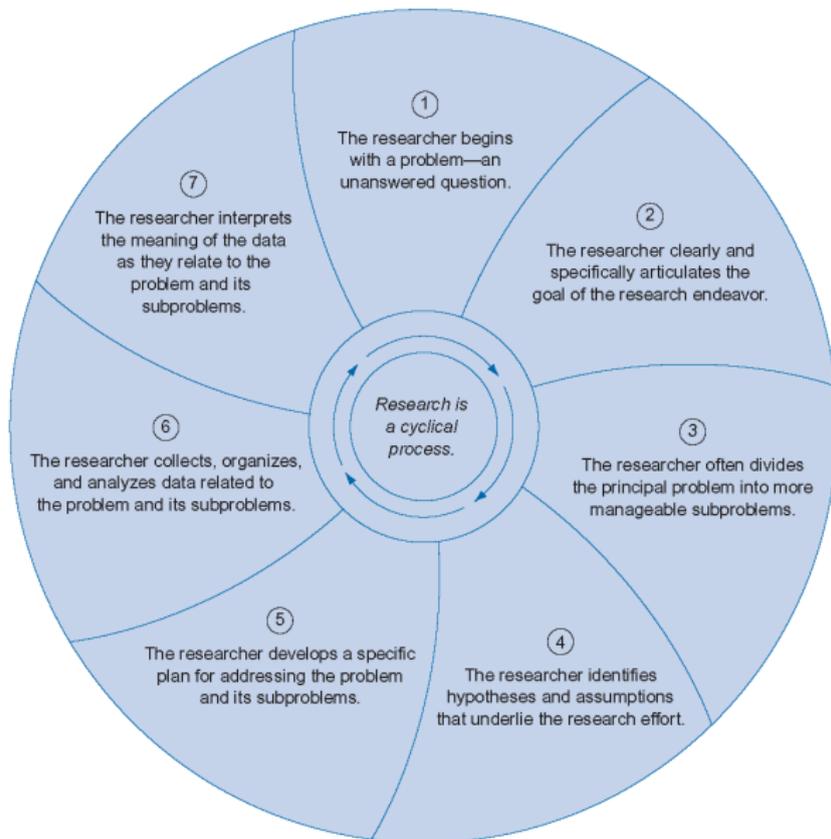
## Research Is

- A systematic **process** of collecting, analyzing, and **interpreting** information (data) to **increase understanding** of a phenomenon about which we are interested or concerned.
- A human activity based on **intellectual investigation** and aimed at **discovering, interpreting, and revising** human knowledge on different aspects of the world.

# Characteristics of Research

- Research originates with a question or problem
- Requires clear articulation of a goal
- Requires a specific plan for proceeding
- Usually divides the principal problem into more manageable subproblems
- Is guided by the specific research problem, question, or hypothesis
- Requires a specific plan for proceeding
- Accepts certain critical assumptions
- Requires the collection and interpretation of data
- Is a cyclical process

# Research Cycle



# Reasons for Doing Research

- To add to the body of knowledge
- To solve a problem
- To find out what happen
- To find evidence to inform practice
- To develop a greater understanding of people or their world
- To predict, plan and control
- To contribute to other people's well-being
- To contribute to personal needs
- To test or disprove a theory
- Etc.

And you, why are you doing research?

# Research Tools vs Research Methodology

## Research Tools

The specific mechanisms or strategies used to collect, manipulate, or interpret data.

# Research Tools vs Research Methodology

## Research Tools

The specific mechanisms or strategies used to collect, manipulate, or interpret data.

## Research Methodology

The general approach the researcher takes in carrying out the research project. This approach **dictates** the **particular tools** the researcher selects.

# Research Tools

- The library and its resources
  - Fast and efficient means of locating and accessing information on virtually any topic
- Computer technology
  - Analysis and interpretation
  - Storage of large amount of information
  - Reporting & Communication, etc.
- Measurement
  - Limiting the data of any phenomenon (substantial or insubstantial) so that those data may be **interpreted** and, ultimately, **compared** to a particular qualitative or quantitative standard
  - Measurement requires **valid and reliable** instruments
    - E.g.: rulers, scales – to measure physical characteristics-
    - E.g.: tests and questionnaires – to measure the impact of social and psychological phenomena

# Research Tools

- Statistics
  - Descriptive statistics, used to describe the data
  - Inferential statistics, used to draw inferences from the data
- Language
  - A tool to communicate and think more effectively
  - Words have multiple meaning. Clarity is essential in research writing.
  - Words enhance thinking by:
    - reducing the world's complexity
    - allowing abstraction of the environment
    - enhancing the power of thought
    - facilitating generalization and inference drawing in new situations.

# Language — Writing to Communicate

## The Importance of Writing

- **Visibility / Dissemination**, a research report helps to reach a large audience
- Writing enhances the writer's **understanding** about the topic!

## Writing to Communicate – Guidelines

- Say exactly what you mean
- Keep your primary objective in mind at all times
- Provide an overview of what you will be discussing
- Organize ideas into general and more specific categories by using headings and subheadings
- Use transitional words, phrases, or paragraphs to help readers follow your train of thought
- Use concrete examples to make abstract ideas more understandable
- Use appropriate punctuation.
- Use figures and tables — **a picture is worth a 1000 words**
- At the end of chapters and major sections, summarize what you've said
- Anticipate having to write multiple drafts.

# The Human Mind as a Tool of Research

- Critical Thinking – Evaluating arguments in terms of their accuracy and worth.
  - May take a variety of forms: verbal reasoning, argument analysis, decision making, and critical analysis of prior research
- Deductive Logic
  - Begins with one or more premises, statements or assumptions that the researcher initially takes to be true
  - Valuable for generating research hypotheses and testing theories
- Inductive Reasoning
  - Begins with an observation of a specific event to draw conclusions about entire classes of objects or events (i.e., observe a sample and then draw conclusions about the population from which the sample has been taken).

# The Human Mind as a Tool of Research

- The Scientific Method — The means whereby insight into the unknown is sought by
  - (i) identifying a problem that defines the goal of one's quest;
  - (ii) positing a hypothesis that, if confirmed, resolves the problem;
  - (iii) gathering data relevant to the hypothesis; and
  - (iv) analyzing and interpreting the data to see whether they support the hypothesis and resolve the research question.
- Theory Building: is based on facts rather than naïve beliefs and subjective impressions about the world:
  - involves thinking actively and intentionally about the phenomena at hand,
  - yields hypotheses to be tested,
  - tends to be a slow process,
  - usually involves collaboration with others.
- Collaboration with Other

# The End