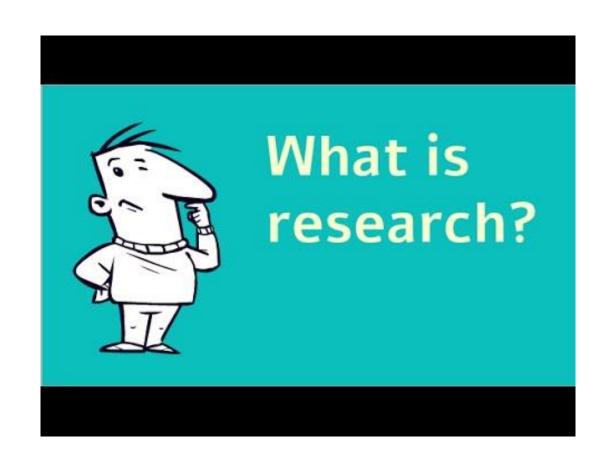
# Research Methodology



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# Introduction to research



- ❖ Systematized effort to gain new knowledge (Redman and Mory, 1923).
- Research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue (Creswell, 2008).

## Aim?

• The main aim of research is to find out the truth which is hidden and which has not been discovered yet.



# Objectives?

- 1-To gain familiarity with a phenomenon or to achieve new insights into it.
- 2. To portray accurately the characteristics of a particular individual, situation or a group.
- 3. To determine the frequency with which something occurs or with which it is associated with something else.
- 4. To test a hypothesis of a causal relationship between variables.

## Research consists of three steps

**Create a question** 

Present an answer to the question

Collect data to answer the question

# How to create a question?



**Critical thinking** 

## Motivation in research

What makes you to undertake research?



- 1. Desire to get a research degree along with its consequential benefits
- 2. Desire to face the challenge in solving the unsolved problems. i.e., concern over practical problems initiates research.
- 3. Desire to get intellectual joy of doing some creative work.
- 4. Desire to be of service to society.
- 5. Desire to get respectability.
- 6. Others

# Types of research

- Descriptive vs. Analytical
- Applied vs. Fundamental (Basic)
- Quantitative vs. Qualitative
- Conceptual vs. Empirical
- Some others

# Descriptive research

- Includes surveys and fact-finding enquiries of different kinds. The major purpose of descriptive research is description of the state of affairs as it exists at present.
- The main characteristic of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening.
- The methods of research utilized in descriptive research are survey methods of all kinds.

# Analytical research

- The researcher has to use facts or information already available, and analyze these to make a critical evaluation of the material.
- Analytical research is conducted in a variety of ways including literary research, public opinion, scientific trials and Meta-analysis.



**Descriptive** research

Describes the fact

Analytical research

Why it is that way or how it came to be

# Applied research

Aims at finding a solution for a scientific/practical problem.

#### **Examples:**

- -Investigate methods to:
- Improve the color stability of resin composite.
- Treat or cure a specific disease.
- Improve the energy efficiency of homes, offices, or modes of transportation.

# Fundamental (Basic or pure) research

- Mainly concern with generalizations and with the formulation of a theory.
- Scientist's curiosity or interest in a scientific question.

#### **Examples:**

- How does implant integrate with the jaw bone?
- How did the universe begin?
- What are protons, neutrons, and electrons composed of?

Fundamental research

Developing new theories

Applied research

Finding a solution for a certain problem

## Quantitative research

- Based on the measurement of quantity or amount.
- Uses measurable data to formulate facts in research.
- Data analysis is statistical.

#### **Examples:**

- ➤ Survey conducted to understand the amount of time a dentist needs to perform scaling and polishing.
- Experiments conducted to understand the amount of implant insertion torque needed to achieve an acceptable implant primary stability.

## Qualitative Research

- Concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind.
- In-depth interviews are optimal for collecting data.
- Data analysis in non statistical

#### **Examples:**

- ✓ Researches about reasons of human behavior, opinions, beliefs and emotions.
- ✓ Research designed to find out how people feel or what they think about a particular subject or institution

# Conceptual research

• Is that related to some abstract idea(s) or theory. It is generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones.

#### **Examples:**

The most famous example of a conceptual research is Sir Issac Newton. He observed his surroundings to conceptualize and develop theories about gravitation and motion.

# Empirical research

- Relies on experience or observation alone, often without due regard for system and theory.
- It is data-based research, coming up with conclusions which are capable of being verified by observation or experiment.
- More reputable in medical researches than conceptual research
- It could be called (experimental type of research).

#### **Examples:**

Testing whether drinking coffee after tooth extraction results in bleeding.

# Other types of research

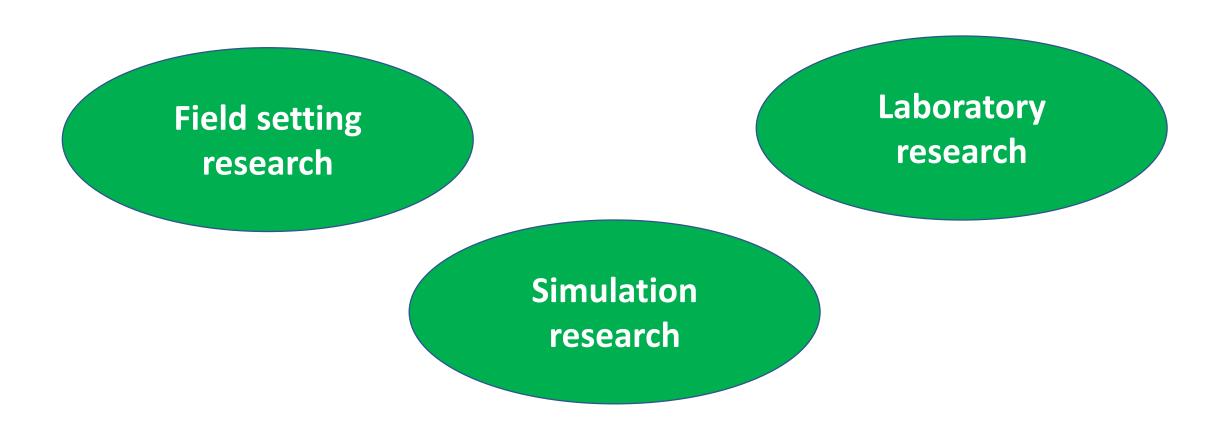
• They are variations of one or more of the above stated approaches based on either the purpose of research, or the time required to accomplish research, on the environment in which research is done.

# Types of researches based on time





# Types of researches based on environment



#### Clinical research

- Such research follow case-study methods or in-depth approaches to reach the basic causal relations. Such studies usually go deep into the causes of things or events that interest us, using very small samples and very deep probing data gathering devices.
- Determines the safety and effectiveness (efficacy) of medications, devices, diagnostic products and treatment regimens intended for human use.

# Exploratory vs Formalized research

- Exploratory research is the development of hypotheses rather than their testing.
- Formalized research studies are those with specific hypotheses to be tested.



### Historical research

 Utilizes historical sources like documents, remains, etc. to study events or ideas of the past, including the philosophy of persons and groups at any remote point of time Please read (Kothari, "Research Methodology Methods & Techniques", Second Edition) for more information

Thank you