

# Research Methodology.

- Methodology is the systematic, theoretical analysis of the methods applied to a field of study.
- Research Methodology is the specific procedure or techniques used to identify, select, process & analyse information about a topic.
- It has two primary functions.
  1. to control & dictate the acquisition of data
  2. to enclose the data after acquisition & extract meaningfulness from them.

## Types of Research.

### 1. Pure Research (Basic / fundamental / theoretical)

- It is an original type of research.
- mainly related with generalisations & with the formulation of a theory.
- Aims at extension of knowledge.
- not related with solving of any practical problems.
- leads to discovery of new theories & development of existing theories.
- Results seen in long terms.
- Act as foundation for Applied Research.

## 2. Applied Research or Action Research.

- Also known as Practical Research.
- It relate with Current Activity or immediate Practical Situations.
- conducted on the basis of application of theories or models for finding a solution for an immediate problem faced by society.
- Research in the field of Social planning, Social legislation, Social hygiene, religion etc. are known as applied research.

## 3. Social Science Research.

- It deals with scientific investigations conducted in the field of Social Sciences & also in behavioural Sciences.
- It involves application of scientific method for the understanding, studying & analysing of social life in order to modify, correct or verify the existing knowledge as a system.
- Also deals with human behaviour & social problems.
- So it studies the social values, beliefs, traditions, events etc.
- find out new facts & verifies old facts on the basis of applying certain tests on old facts.

#### 4. Descriptive Research.

- It is fact-finding investigation.
- Simplest type of Research.
- gather descriptive information.
- It provides information for formulating complex studies.
- data collected through observation, interview & mailed questionnaire.
- not deal with testing of hypothesis or propositions.
- used in physical, natural sciences & social sciences.
- use in explanation of the state of affairs as it exist at present.
- It applicable to problems, which satisfy certain criteria
  - Problem must be describable.
  - Data should be reliable & significance.
  - possible to develop valid standards of comparison.
  - should provide verifiable procedure of collection & analysis of data.

#### 5. Analytical Research.

- Available data are analysed & critical evaluations are made to solve the problems.
- related with testing of hypothesis & specifying interpreting relationships.
- mathematical models & advanced statistical techniques like correlation, multivariate analysis etc used.
- data collected from primary & secondary sources.

## 6. Quantitative Research & Qualitative Research

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|--|--|
| <p>↓</p> <p>→ It based on the measurement of a quantity or amount.</p> <p>→ based on quantitative phenomena.</p> | <p>↓</p> <ul style="list-style-type: none"><li>• Related with qualitative Phenomena.</li><li>• eg - Motivation Research.</li><li>• mainly used in behavioural Sciences.</li><li>• Other eg - Attitude or Opinion research.</li></ul> |
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## 7. Empirical Research

- based on experience or observation alone.
- data based Research.
- use hypothesis.

## 8. Conceptual Research

- Conducted by philosophers & thinkers to develop new concepts.
- Related with theory or conceptual ~~data~~ ideas.

## 9. Experimental Research

- Aim is determining whether & in what manner variables are related to each other.
- Related with Cause & effect.
- identify the variables under study & to determine if changes in one variable result in changes in another.



- Researcher selects two identical groups which exist in physical & natural sciences.
- It has limited application in social science.
- one group is experimental group & other is controlled group.
- The difference between the experimental & control group outcome is attributed to the effect of the experimental value.

### 10 Exploratory or Formulative Research.

- It is an initial research.
- It is a preliminary study of a new problem about which the researcher has little or no knowledge.
- research provides a basis for general findings.
- These findings used for further study for future.
- not test hypothesis.
- But it lays the foundation for the formulation of different hypothesis.

#### Types

1. Literature Survey
2. Experience "
3. Study of insight stimulating cases.

## 11 Creative Research

- Involves the development of new theories, new procedures & new inventions.
- It includes both practical & theoretical research
  - Practical Creative Research
    - design of physical things & the development of real world processes, it proceeds by trial & error.
  - Theoretical Creative Research
    - discovery or creation of new models, theorems, algorithms etc.
- less structured & not always be pre-planned.

## 12 Historical Research

- using past events to examine a current situation & to predict future situations.
- Data collected from primary sources & secondary sources.
- eg - stock market forecasting.
- Success of this research depends upon the relevance, completeness, reliability etc of data.

## 13. Expository Research

- based on existing information & results in review type reports.
- For this, researcher read widely on a field, and then comparing, contrasting, analysing & synthesizing all points on a subject.
- eg - Analysis of works of prominent authors.

#### 14 Ex Post facto Research.

- Ex Post facto means 'form after the fact'
- This research used when data are available that not generated by experimental Research.

#### 15 Diagnostic Research.

- Similar to descriptive Research
- aims to identify the causes of a problem & finds possible solution for solving the problems.
- It is directed towards discovering what is happening, why is it happening & what can be done about it.
- Concerned with causal relationship & implications for action.

#### 16 Evaluation Research.

- It is done to assess the effectiveness of implemented social or economic programmes.
- It is a type of applied Research.

##### Types.

1. Simultaneous evaluation
2. periodic evaluation
3. Terminal evaluation.

## 17 Case Study

- It is a method or technique or an approach of exploring or analysing the life of a social unit.
- Social Unit means a person / a family / Institution / Organisation / a Community.
- In depth study of a single unit.

## Research Approaches.

### Quantitative Research.

- It is statistic-based.
- involves collecting & converting data into quantitative form (statistical calculations)
- On that basis we can draw conclusions.
- Objectivity is very important.
- research conducted on a predetermined hypothesis.
- Data collected through strict procedure & prepared for statistical analysis.
- Such as Online questionnaires, on-street or telephone interviews. (data collection)
- It includes deductive reasoning (move from the general to the specific)  
↓
- Top down approach

### Qualitative Research.

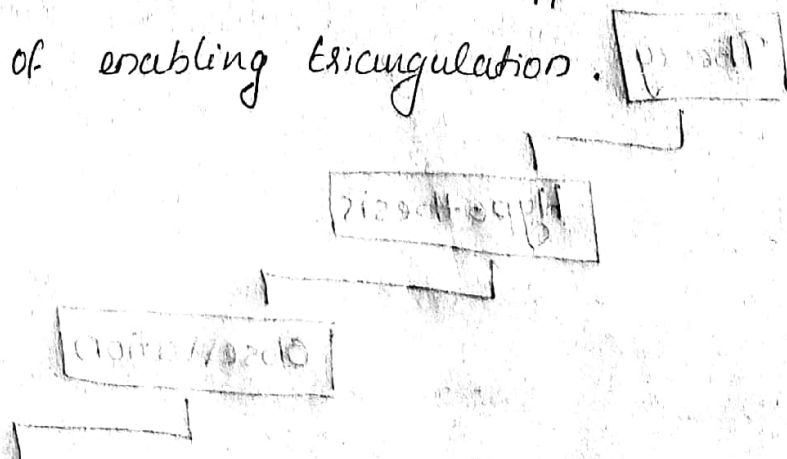
- It is description-based
- It observe & interview people.



- It is about recording, analysing & attempting to uncover the deeper meaning & significance of human behaviour & experience, including contradictory beliefs, behaviours & emotions.
- Bottom-up approach (moves from the specific to the general)
- Data collected through observation, in depth interviews & focus groups.
- involves smaller numbers of participants.
- used in the social & behavioral sciences.

### Pragmatic Approach to Research (Mixed Methods)

- association of quantitative or qualitative research.
- Researchers start with face-to-face interviews with several people or have a focus group & then use the findings to construct a questionnaire to measure attitudes in a large scale sample with the aim of carrying out statistical analysis.
- Being able to mix different approaches has the advantages of enabling triangulation.



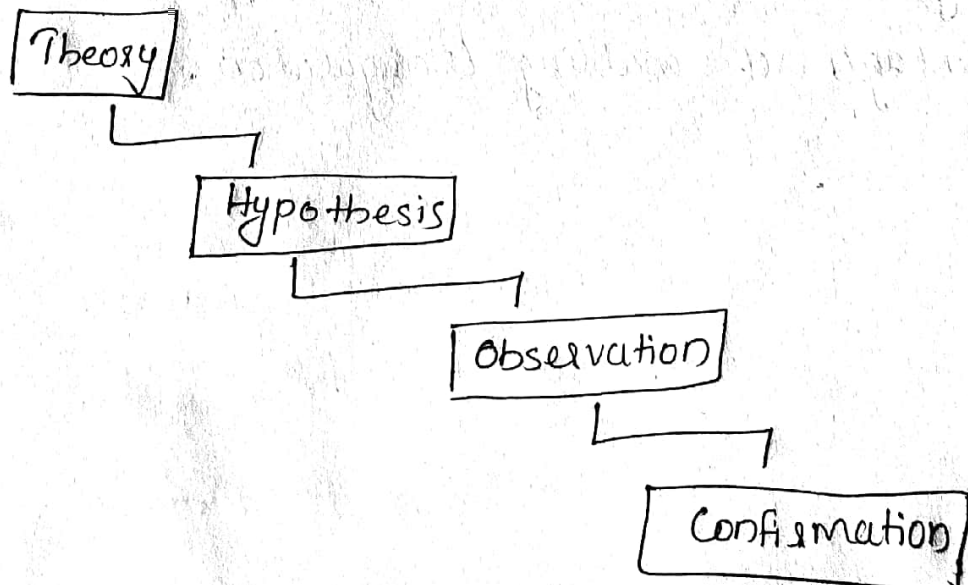
In research, conclusions are based on two methods known as the deduction & Induction.

On the basis of Methods, Research approach can be divided into 3 types.

1. Deductive Research Approach
2. Inductive " "
3. Abductive " "

### 1. Deductive Research Approach.

- Deduction follows → "top down" or 'from general to specific'.
- Start from a theory & try to prove it right with the help of available information.
- It is a reasoning process of applying a general accepted principle to a specific individual case falling under the general principle.
- For a deduction to be correct, reason & conclusion must be true & valid.



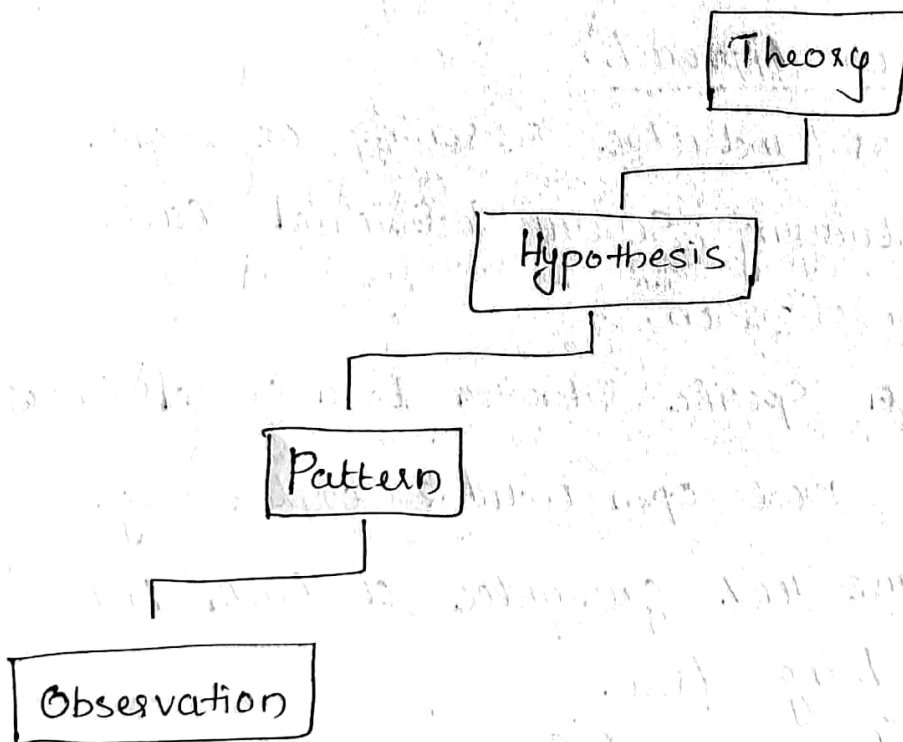
- this approach is not useful for arriving truths.
- the premises (basis or evidence) provide a guarantee of the true conclusion.
- eg: 1 There are 32 books on the top-shelf of the bookcase  
 2 " " 12 " " lower-shelf " "  
 3. There are no books anywhere on the bookcase.  
 From this, it can be concluded there are 44 books in the book case.

## 2. Inductive Research Approach.

- It also known as inductive reasoning or logic.
- It consists of studying several individual cases and drawing a generalization.
- involves from a specific situation to a general conclusion.
- This method is more open ended & exploratory.
- This does not give 100% guarantee of truth but probability of being true.
- Induction is "bottom-up" (from specific to general)
- It includes two process - observation & generalization.
- In this we observe some happening, detect a pattern & draw a conclusion.
- this method is followed when new facts are studied

According to Clover, Vernon T. & Howard L. Bales, four conditions are essential to satisfactory induction.

1. Observation must be correctly performed & recorded, data collected should be accurate.
2. Observation must cover representative cases drawn from a specific universe.
3. Observation must cover an adequate number of cases.
4. Conclusions must be confined to inferences drawn from the findings.



- eg:-
1. Socrates was Greek (Premise -1)
  2. Most Greeks eat fish ( " 2)
  3. Socrates ate fish (conclusion)

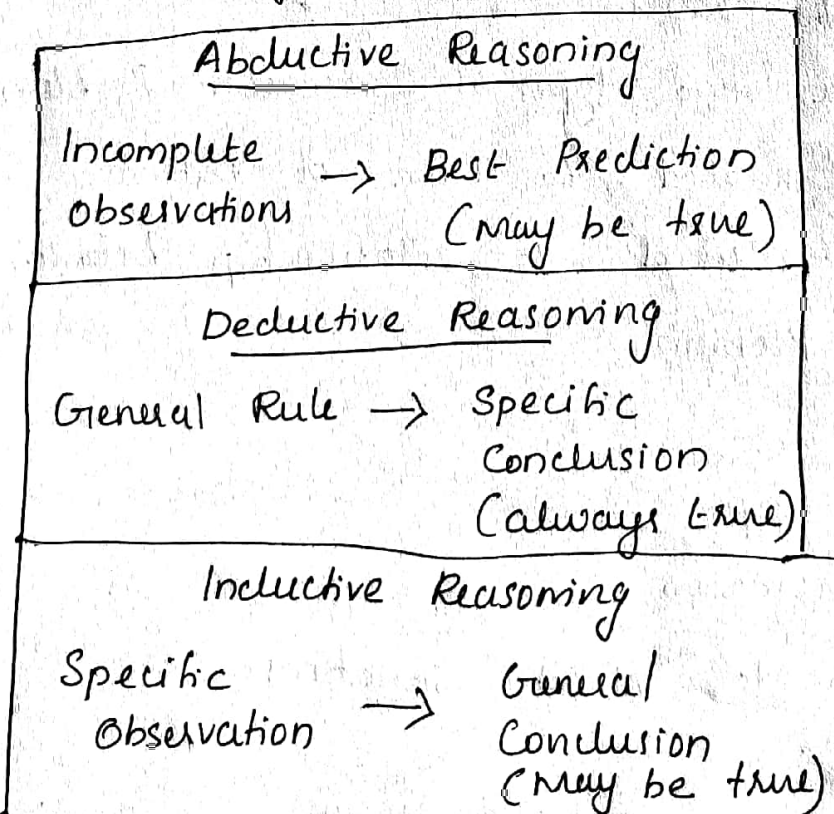
while the premises were true, it is possible that conclusion was false, may be Socrates was allergic to fish.



→ Inductive approach is weaker than deductive because there is possibility of arriving at false conclusion

### Abductive research Approach.

- explanation of incomplete observations, surprising facts, puzzles specified at the beginning of the study.
- It is set to address weaknesses associated with deductive & inductive approaches.
- using abductive approach, researcher seeks to choose the best explanation among many alternative in order to explain surprising facts or puzzles identified at the start of the research process.
- For this researcher can combine both numerical & cognitive reasoning.





## Problems faced by Researchers.

1. Lack of knowledge in research methods
2. Lack of sufficient materials
3. No code of conduct for researchers.
4. Lack of coordination b/w research depts & business units.
5. Approach of advisors.
6. Absence of proper guide
7. Non availability of new data.
8. Attitude of library department.
9. Non availability of funds.
10. Lack of knowledge about analytical tools.