

Research Design

The background features a vibrant, abstract composition. It consists of several overlapping squares in various colors, including purple, yellow, red, and orange. Some squares have thick black borders, while others are thin outlines. The squares are scattered across the page, with some appearing to be layered on top of others. Interspersed among the squares are splatters of purple and red ink, adding a dynamic and artistic feel to the design.

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Research Design

- A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.
- The research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data.



Research Design

- a **framework / blue print** for the research plan of action.
- a **master plan** that specifies the methods and procedures for collecting and analyzing the needed information
- a **strategy** for how the data will be collected

Research Design

Research Design Constitutes Decisions like:

- What
- Where
- When
- How
- How much





Need for Research Design:

- It facilitates the **smooth flow** of various research processes.
- It would result in more accurate results with minimum usage of time, effort and money
- It organize the study in a certain way defending the advantages of doing while being aware and caution about potential disadvantages



Need for Research Design:

- It maintains control to avoid bias that may affect the outcomes.
- Research design helps in advance planning of the methods which are adopted for collecting the relevant data.
- It provides the scheme for answering research question.

Features of a good design



Characteristics of good design

- **Objectivity**
- **Reliability & Validity**
- **Generalization**
- **Freedom from biasness**
- **Control of extraneous Variables**
- **Statistical Precision for testing Hypothesis**
- **Flexibility**

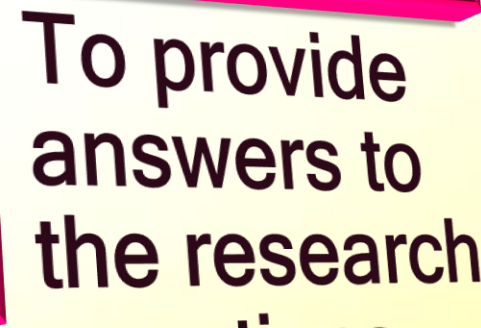




Objectives Of Research Design



**To control
variance**



**To provide
answers to
the research
questions.**



Process of Research Design

1. Define Research Problem
2. Literature Review
3. Area of Study
4. Objective of study
5. Sample Design
6. Collection of Data
7. Analysis and Interpretation of Data.
8. Presentation of Data.
9. Testing of Hypothesis.
10. Tools and Technique used in Research.
11. Organization of study.
12. Limitation of study.
13. Significance of Study.
14. Future Possibilities in Research.
15. Implication of Research.





Research Design Process

1. THE DESIGN & PLANNING PHASE : - In the design phase the researcher makes a number of decisions about the methods to be used to address the RQ.

The research process:-

2. IDENTIFYING THE POPULATION TO BE STUDIED:-

1. The term population refers to the aggregate or totality of all the objects, members that conform to a set of specifications.
2. The researcher identifies the population during the planning phase.
3. The researcher must know the characteristics of the study

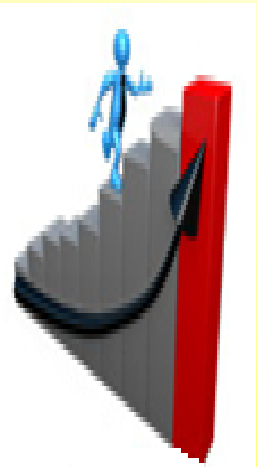


Process Cont...

3. SPECIFYING METHODS TO MEASURE THE RESEARCH VARIABLES:

- 1. The researcher must develop a method to observe & measure research variable as accurately as possible.
- 2. A variety of quantitative data collection approaches exist, e.g..bio-physiological measurements, self reports, observation.

4. DEVELOP DATA COLLECTION PLAN:-Data collection methods vary depending on the RQ & methodology. The task of measuring research variables & to develop data collection plan is a complex process



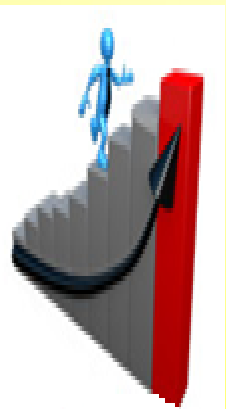
Process Cont..

5. DESIGNING THE SAMPLING PLAN: -

1. As entire population cannot be studied researcher uses a small fraction of the population.-sample.
2. The researcher employs many methods to obtain the sample.
3. In applying the methods the researcher ensures representativeness of the selected sample.
4. Methods of sampling include probability & non-probability sampling

6. FINALIZING & RE-VIEWING THE RESEARCH PLAN:

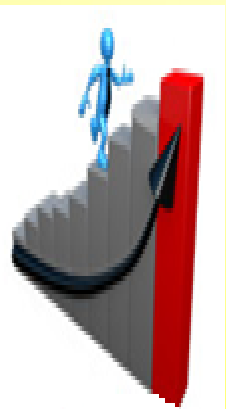
1. Researchers must finalize the research plan by individuals, groups before the actual implementation.
2. The researcher must have their research plan approved by special committees as to ensure that the plan does not violate ethical



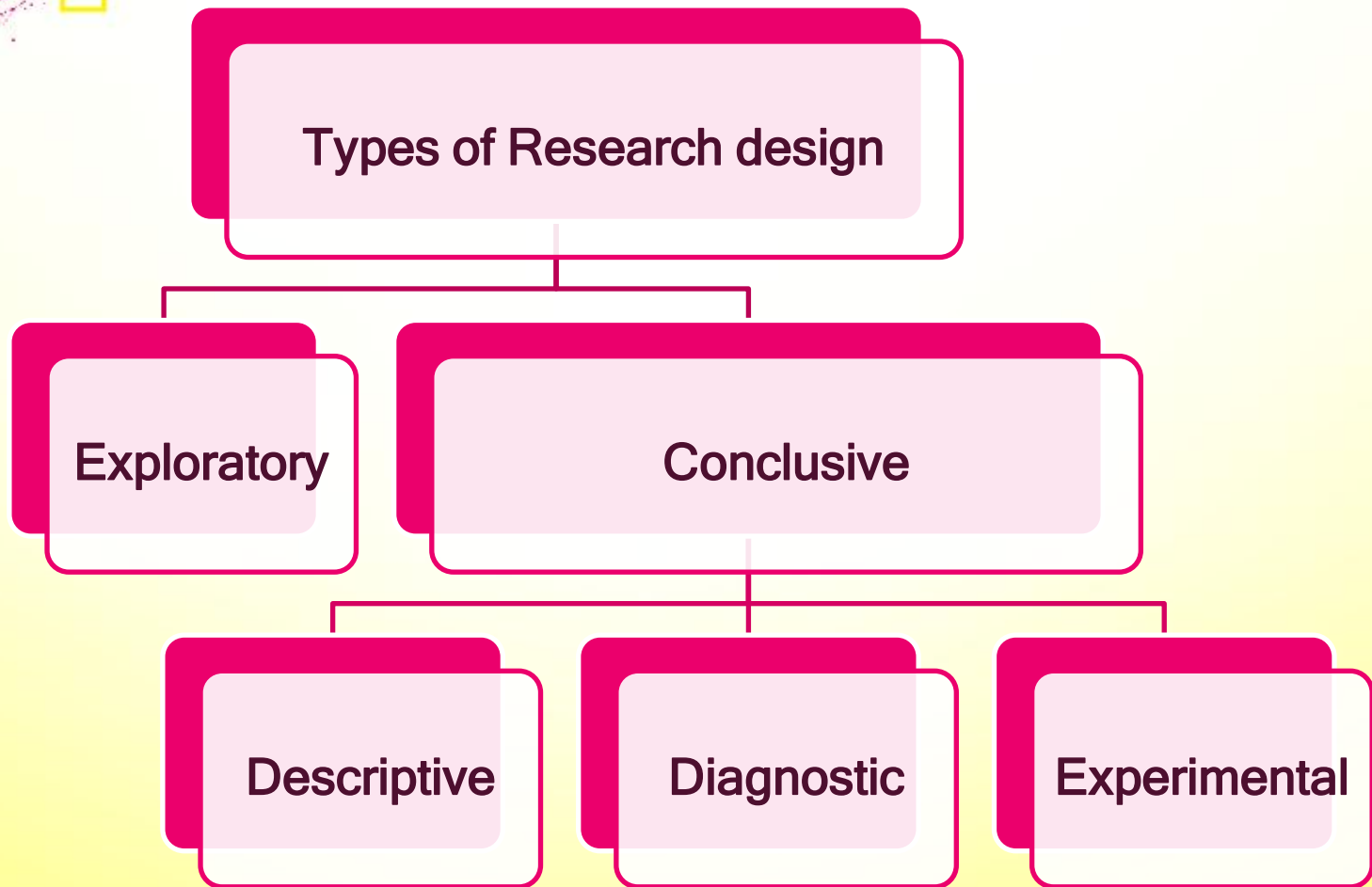
Process Cont...

7. CONDUCTING PILOT STUDY & REVISION:-

1. The primary focus of the pilot study is to assess the adequacy of the data collection plan.
2. The researcher needs to know the adequacy of the technical equipment.
3. The tool for data collection is validated & is termed as pre-testing.
4. Pilot study should be carried out with care as a major study.
5. The pilot study subjects should be chosen from the same population as of the main study.



Types of Research design



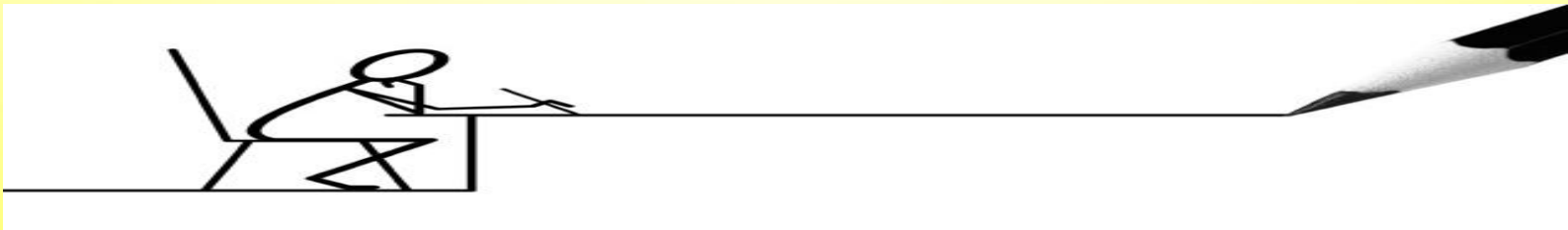


Exploratory Design

- Exploratory research is most commonly unstructured, “informal” research that is undertaken to gain background information about the general nature of the research problem.
- Exploratory research is usually conducted when the researcher does not know much about the problem and needs additional information or desires new or more recent information.

Exploratory Design: Contd...

- Exploratory research is used in a number of situations:
 - To analysis a problem
 - To discover new ideas
 - To develop concept more clearly
 - To establish research priorities





Exploratory Design: Contd...

A variety of methods are available to conduct exploratory research:

- **Secondary Data Analysis**
- **Experience Surveys**
- **Case Analysis**





Descriptive /diagnostic Research Design

- Descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual, or of a group, whereas,
- Diagnostic research studies determine the frequency with which something occurs or its association with something else.

Diagnostic research studies:



Cross-sectional studies

Longitudinal studies

- **Cross-sectional studies** measure units from a sample of the population at only *one point in time*.
- Sample surveys are cross-sectional studies whose samples are drawn in such a way as to be representative of a specific population.
- On-line survey research is being used to collect data for cross-sectional surveys at a faster rate of speed.



Cross-sectional studies

Longitudinal studies


- **Longitudinal studies** repeatedly draw sample units of a population over time.
- One method is to draw different units from the same sampling frame.
- A second method is to use a “panel” where the same people are asked to respond periodically.
- On-line survey research firms recruit panel members to respond to online queries





Experimental design

- Experimental design is where the researcher test the hypothesis of causal relationship between variables. Such studies required procedures that will not only reduce bias and increase reliability, but will permit drawing inferences about causality.



Important Experimental Design:



Formal
experimental
designs



Informal
experimental
designs



Important

Experimental Design:

Informal experimental designs

- (i) Before-and-after without control design.
- (ii) After-only with control design.
- (iii) Before-and-after with control design.

Formal experimental designs


- (i) Completely randomized design (C.R. Design).
- (ii) Randomized block design (R.B. Design).
- (iii) Latin square design (L.S. Design).
- (iv) Factorial designs.



Informal experimental designs:

1. Before-and-after without control design

In such a design a single test group or area is selected and the dependent variable is measured before the introduction of the treatment. The treatment is then introduced and the dependent variable is measured again after the treatment has been introduced. The effect of the treatment would be equal to the level of the phenomenon after the treatment minus the level of the phenomenon before the treatment.



The design can be represented as under:

Test area:	Level of phenomenon before treatment (X)	Treatment introduced	Level of phenomenon after treatment (Y)
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$$\text{Treatment Effect} = (Y) - (X)$$

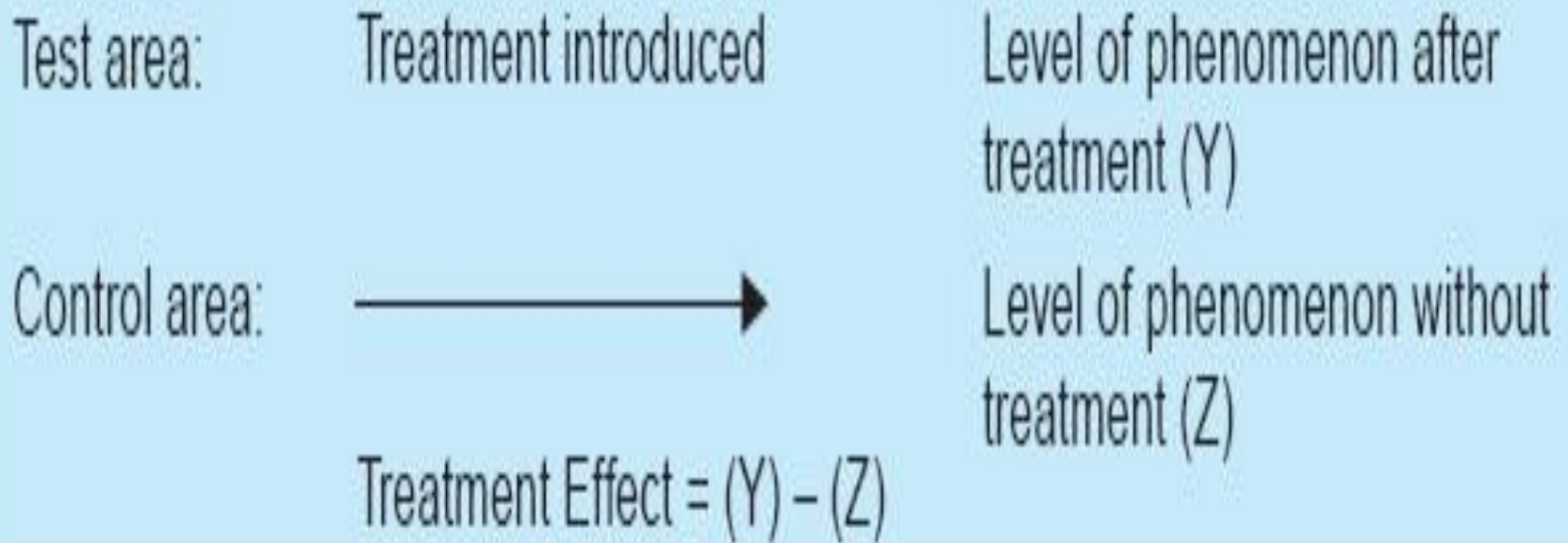


2. After-only with control design:

- In this design two groups or areas (test area and control area) are selected and the treatment is introduced into the test area only.
- The dependent variable is then measured in both the areas at the same time.
- Treatment impact is assessed by subtracting the value of the dependent variable in the control area from its value in the test area.



This can be exhibited in the following form:





3. Before-and-after with control design

- In this design two areas are selected and the dependent variable is measured in both the areas for an identical time-period before the treatment. The treatment is then introduced into the test area only, and the dependent variable is measured in both for an identical time-period after the introduction of the treatment.
- The treatment effect is determined by subtracting the change in the dependent variable in the control area from the change in the dependent variable in test area.



Formal experimental designs:

1. Completely randomized design (C.R.design):

It involves only two principles viz., the principle of replication and the principle of randomization of experimental designs. It is the simplest possible design and its procedure of analysis is also easier. The essential characteristic of the design is that subjects are randomly assigned to experimental treatments.



2 .Randomized block design (R.B. design)

It is an improvement over the C.R. design. In the R.B. design the principle of local control can be applied along with the other two principles of experimental designs. In the R.B. design, subjects are first divided into groups, known as blocks, such that within each group the subjects are relatively homogeneous in respect to some selected variable.



3. Latin square design (L.S. design)

It is an experimental design very frequently used in agricultural research. The conditions under which agricultural investigations are carried out are different from those in other studies for nature plays an important role in agriculture. In such a case the varying fertility of the soil in different blocks in which the experiment has to be performed must be taken into consideration.



4. Factorial designs

Factorial designs are used in experiments where the effects of varying more than one factor are to be determined. They are specially important in several economic and Social phenomena where usually a large number of factors affect a particular problem.

Thank You

