UNIT FOUR
RESEARCH DESIGN

INTRODUCTION

Once you formulate the research problem, research design must be developed. These decisions will affect the overall believability of your findings.

SECTION I
BASICS OF RESEARCH DESIGNS

1.1 MEANING AND DEFINITION OF RESEARCH DESIGN

Research design is a master plan specifying the **methods and procedures** for collecting and analyzing the needed information. It is a ***framework of the research plan of action.***

Definition: research design is the science and art of **planning procedures for conducting studies** so as to get the most valid findings.

Research design is the **plan, structure and strategy of investigation** conceived to obtain answers to research questions and to control variance. A research design is the specification of methods and procedures for acquiring the information needed. It is the overall operational pattern or framework of the project that stipulates what information is to be collected from which sources by what procedures.

The decisions regarding what, where, when, how much, by what means concerning a research project constitute a 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."

In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. More explicitly, the design decisions happen to be in respect of:

- What is the study about?
- Why is the study being made?
- Where will the study be carried out?
- What type of data is required?
- Where can the required data are found?
- What periods will the study include?
- What will be the sample design?
- What techniques of data collection will be used?
- How will the data be analyzed?
- In what style will the report be prepared?

Keeping in view the above stated design decisions; we may split the Overall research design into the following parts.

- ***Sampling design*** - which deals with the method of **selecting items** be observed for the given study;
- ***Observational design*** - which relates to the **conditions under** which the observations are to be made;
- ***Statistical design*** - which concerns with the question of how many items are to be observed and how the information and ***data gathered are to be analyzed;***

☞ ***Operational design*** **-** which deals with the techniques by which the procedures specified in the sampling, statistical and observational designs, can be carried out.

1.2 ESSENTIALS OF RESEARCH DESIGNS

- The design is an activity-and-time-based plan
- The design is always based on the research question
- The design guides the **selection of sources** and types of information
- The design is a framework for specifying the relationships among the study's variables
- The design outlines procedure for every research activity

1.3 WHY RESEARCH DESIGN IS REQUIRED?

Research design is needed because it *facilitates the smooth sailing of the various research operations*, thereby making research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money.

For example, economical and attractive construction of house we need a blueprint (or what is commonly called the map of the house) well thought out and prepared by an expert architect, similarly we need a research design or a plan in advance of data collection and analysis for our research project.

Research design stands for ***advance planning*** of the methods to be adopted for collecting the relevant data and the techniques to be used in their analysis.

1.4 CONCEPTS IN RESEARCH DESIGN

Operational Definitions is a definition stated in trace of specific testing criteria or operations.

Variable – this is used as a **synonym for construct** or the property being.

Independent – A variable antecedents to dependent variable is called independent variable

Dependent – If one variable depends upon or is a consequence of other variable, it is a dependent variable.

Proposition – is a statement about concepts that may be judged as true or false if it refers to observable phenomenon. When a proposition is formulated for empirical testing, it is called a hypothesis. The research hypothesis is a predictive statement that relates an independent variable to dependent variable.

Continuous Variable- A variable that can assume any numerical value within a specific range. Value given in decimal points e.g. age.

Discrete Variable– A variable for which the individual values fall on the scale only. Example, no of children

Extraneous Variable - Some independent variables are not related to purpose of study, but may affect dependent variables are turned as extraneous variable.

Control - Minimize effect of extraneous independent variable. In experiment at researches, 'control' is used to refer to restrain experimental conditions.

Confounded Relationship - When the dependent variable is not free from influence of extraneous variables(s), the relation between independent variable and dependent variable is said to be **confounded by an extraneous variable**.

Experimental and non-experimental hypothesis testing research: Research in which the independent variable is manipulated called experimental hypothesis-testing research and a research in which an independent variable is not manipulated is called non–experimental hypothesis-testing research.

Experimental & Control Group: When a group is exposed to ***usual conditions***, it is traced as *'control group'* but when the group is exposed to some moral or special condition, it is termed as 'experimental group'.

Treatment: the different conditions under which experimental and control group are put are usually referred to as 'treatments'.

SECTION II: DIFFERENT RESEARCH DESIGN

2.1 EXPLORATORY RESEARCH DESIGN

Exploratory research studies are also termed as **formultive research** studies. The main purpose of such studies is that of formulating a problem for more precise investigation or of developing the working hypotheses from an operational point of view.

The major emphasis in such studies is on the **discovery of ideas** and insights. The research design appropriate for such studies must be **flexible enough** to provide opportunity for considering different aspects of a problem under study.

2.2 DESCRIPTIVE AND DIAGNOSTIC RESEARCH DESIGN

Now another type of research studies are - descriptive research studies, 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.

The studies concerning whether certain variables are associated are examples of diagnostic research studies. The studies concerned with specific predication, with narration of facts and characteristics concerning individuals or group or situation are all examples of descriptive research studies.

From the point of view of the research design, the descriptive as well as diagnostic studies share common requirement, and as such, we may group together these two types of research studies. In descriptive as well as in diagnostic studies, the researcher must be able to define clearly, what he **wants to measure** and **must find adequate methods for measuring it along with a clear cut definition of population he wants to study**. The research design must make enough provision for protection against bias and must maximize reliability, with due concern for the economical completion of research study. The design in such studies must be rigid and not flexible and must focus attention on the following:

a. Formulating the objective of the study
b. Designing the methods of data collection
c. Selecting the sample (how much material will be needed?)
d. Collecting the data (where can the required data be found and with what time period should the data be related?)
e. Processing and analyzing the data.
f. Reporting the findings

2.3 HYPOTHESIS TESTING RESEARCH DESIGN

Hypothesis-testing research studies (generally known as **experimental studies**) are those where the researcher tests the hypotheses of causal relationships between variables.

Such studies require procedures that will not only reduce bias and increase reliability, but will permit drawing inferences about causality. Usually experiments meet this requirement. Hence, when we talk of research design in such studies, we often mean the design of experiments. The study of experimental designs has its origin in agricultural research.