UNIT 3 RESEARCH DESIGNS

Structure

3.1 INTRODUCTION

The research interests of social investigators are virtually unlimited. Any social setting is a potential target for scientific examination. In spite of the diversity of possible social topics and/or situations investigated, most contemporary social scientific research is characterized by some type of study plan. This plan is conventionally labelled the Research Design. Research design decides the fate of the proposal and its outcome. If the design is defective, the whole outcome and report will be faulty and undependable. It is upon the design that the nature of data to be collected will very much depend. It is, therefore, desirable that research design should be methodologically prepared.

After studying this unit, you should be able to

- discuss the meaning and concepts of research designs and purpose of research designs.
- describe the features of good research design, or plans that specify how data should be collected and analyzed.
- distinguish between various types of research designs that have been used in the smooth sailing of the various social investigations.

3.2 RESEARCH DESIGN - MEANING AND CONCEPT

The formidable problem that follows the task of defining the research problem is the preparation of the design of the research project, popularly known as the research design. Decisions regarding what, where, when, how much, by what means, concerning an inquiry or, a research study, constitute a research design. Research design is defined as "...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. As such the design includes an outline of what the researcher will do from writing the hypothesis and its

operational implications, to the final analysis of data. More explicitly, the design decisions address the following questions:

i) What is the study about?

ii) Why is the study being made?

iii) Where will the study be carried out?

iv) What type of data is required?

v) Where can the required data be found?

vi) What periods of time will the study include?

vii) What will be the sample design?

viii) What techniques of data collection will be used?

ix) How will the data be analysed?

x) In what style will the report be prepared?

Keeping in view the above stated design decisions; one may split the overall research design into the following parts:

a) the sampling design which deals with the method of selecting items to be observed for the given study

b) the observational design which relates to the conditions under which the observations are to be made

c) the 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 analysed; and

d) the operational design which deals with, the techniques by which the procedures specified in the sampling, statistical and observational designs can be carried out.

From what has been stated above, we can state the important features of a research design as follows

i) It is a plan that specifies the sources and types of information relevant to the research problem.

ii) It is a strategy specifying which approach will be used for gathering and analysing the data.

iii) It also includes the time, and cost budgets since most studies are done under these two constraints.

In brief, research design must, at least, contain: a) a clear statement of the research problem; (b) procedures and techniques to be used for gathering information; (c) the population to be studied; and (d) methods to be used in processing and analysing data.

⇒ **Activity 1:** Talk with several of your colleagues and ask them to define what they mean by Research Design. Compare those definitions with the one given in this unit.

3.3 FUNCTIONS OF RESEARCH DESIGN

Regardless of the type of research design selected by the social investigator, all plans perform one or more functions outlined and discussed below. The number of functions performed by any design largely depends upon its sophistication, coupled with the researcher's concerns.

3.3.1 As a Blue Print

Perhaps the most important function of research designs is that they provide the researcher with a blueprint for studying social questions. Without adequate drawings and plans, a homebuilder would become burdened with insurmountable problems such as where to place the foundation, what kinds and qualities of materials to use, how many workers are required, how large should the home be, and so on. By the same token, a social researcher faces comparable obstacles if he commences his study without some kind of research plan. To minimize his research problems, there are several decisions he should make before beginning his project. For example, if he chooses to study people directly, some possible considerations might be:

1) a description of the target population about which he seeks information

2) the sampling methods used to obtain his elements (people or things)

3) the size of sample

4) the data collection procedures to be used to acquire the needed information

5) possible ways of analyzing the data once collected and

6) whether or not to use statistical tests, and if so, which one(s)? These problems are given strong consideration in a research proposal, prospectus, or study outline that many investigators elect to construct in advance of their research.

3.3.2 Directional Function

Research designs dictate boundaries of research activity and enable the investigator to channel his energies in specific directions. Without the delineation of research boundaries and/or objectives, a researcher's activities in a single project could be virtually endless. Many professors directing the work of their graduate students are probably familiar with the problem of dealing with the loose ends of an improperly planned research project. With clear research objectives in view, however, investigators can proceed systematically towards the achievement of certain goals. The structure provided by the research plan enables the investigator to reach closure and consider any given project completed.

3.3.3 Anticipatory Function

A third function of a research design is that it enables the investigator to anticipate potential problems in the implementation of the study. It is customary for researchers to review current literature central to the topic under investigation. In the course of the literature review, they may learn about new or alternative approaches to their problems. At the same time they can acquire information concerning what can reasonably be expected to occur in their own investigations. Many articles in the professional journals, as well as specialized monographs,

include suggestions for further study. More important, many authors provide criticisms of their own work so that future investigations of the same or similar topics may be improved. In addition, the design can function to provide some estimate of the cost of the research, possible measurement problems, and the optimal allocation of resources such as assistants (manpower) and material.

3.4 THE NEED FOR RESEARCH DESIGN

Research design is needed because it facilitates the smooth sailing of the various research operations, making research as efficient as possible, yielding maximal information, with minimal expenditure of effort, time, and money. Just as for better, economical, and attractive construction of a house, we need a blueprint (or, a 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, keeping in view the objective of the research and the availability of staff, time and money. Preparation of the research design should be done with great care as any error in it may upset the entire project. Research design, in fact, has a great bearing on the reliability of the results arrived at and as such constitutes the firm foundation of the entire edifice of the research work.

Even then, the need for a well thought out research design is, at times, not realised by many. The importance which this problem deserves is not given to it. As a result, research does not serve the purpose for which it is undertaken. In fact, they may even give misleading conclusions. Thoughtlessness in designing the research project may result in rendering the research exercise futile. It is, therefore, imperative that an efficient and appropriate design must be prepared before starting research operations. The design helps the researcher to organize ideas in a form which makes it possible to look for flaws and inadequacies. Such a design can even be given to others for their comments and critical evaluation. In the absence of such a course of action, it will be difficult for a critic to provide a comprehensive review of the proposed study.

3.5 FEATURES OF RESEARCH DESIGN

A good design is often characterised by adjectives like flexible, appropriate, efficient, economical, and so on. Generally, the design which minimises bias and maximises the reliability of the data collected and analysed is considered a, good design. The design which gives the smallest experimental error is supposed to be the best design in many investigations. Similarly, a design which yields maximal information and provides an opportunity for considering many different aspects of a problem, is considered most appropriate and efficient design in respect of many research problems. Thus, the question of good design is related to the purpose or objective of the research problem and, with the nature of the problem to be studied. A design may be quite suitable in one case, but may be found wanting in one respect or other, in the context of some other research problem. One single design cannot serve the purpose of all types of research problems.

A research design appropriate for a particular research problem, usually involves the consideration of the following factors

- the means of obtaining information
- the availability and skills of the researcher and his staff, if any
- the objective of the problem to be studied
- the nature of the problem to be studied
- the availability of time and money for the research work

If the research study happens to be an exploratory or a formulative one, where the major emphasis is on the discovery of ideas and insights, the research design most appropriate must be flexible enough to permit the consideration of many different aspects of a phenomenon. But, when the purpose of a study is to accurately describe a situation, or an association between variables (or, in what are called descriptive studies), accuracy becomes a major consideration and a research design which minimises bias and maximises the reliability of the evidence collected is considered a good design. Studies involving the testing of a hypothesis of a causal relationship between variables require a design which will permit inferences about causality in addition to the minimisation of bias and maximisation of reliability. But, in practice it the most difficult task is to put a particular study in a particular group, for a given research may have in it elements of two or more of the functions of different studies. It is only on the basis of its primary function that a study can be categorised, either as an exploratory or descriptive, or hypothesis testing study, and, accordingly, the choice of a research design may be made in case of a particular study. Besides, the availability of time, money, the skills of the research staff, and the means of obtaining the information must be given due weightage while working out the relevant details of the research design, such as experimental design, survey design, sample design, and the like.

In this section, you have studied research design, the meaning and concept, functions of research design, the need for research design and features of research design, now answer the question given in Check Your Progress 1.

Check Your Progress 1

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit.

1) Write the important functions associated with a research design that you have come across.

.....

.....

.....

.....

2) What are the needs for research design?

.....

.....

.....

.....

3.6 TYPES OF RESEARCH DESIGN

This unit is intended to give a clear depiction of various categories of research designs. For your better understanding, a brief description is given on various categories of research designs.

Exploratory or Formulative Research Design, Descriptive and Diagnostic Research Designs, and Hypothesis testing or Experimental Research Designs, are the three major categories of Research Designs most widely used in social science research.

3.6.1 Exploratory or Formulative Research Design

Exploratory research studies are also termed as formulative 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. As such the research design appropriate for such studies must be flexible enough to provide opportunity for considering different aspects of a problem under study. Inbuilt flexibility in research design is needed because the research problem, broadly defined initially, is transformed into one with more precise meaning in exploratory studies, which in fact may necessitate changes in the research procedure for gathering relevant data.

A pilot study conducted prior to the main investigation is an example. Here, the investigator does not proceed with a pre planned design, but with a well thought out outline (unstructured instrument) for collection of preliminary data, and gain more knowledge and familiarity with the phenomenon, or, the problem, concerned. A non probability, i.e., purposive or judgment sampling design is followed.

Generally, the following three methods in the context of research design for such studies are talked about: (a) the survey of concerning literature; (b) the experience survey, and (c) the analysis of in sight- stimulating examples.

a) **The survey of concerning literature** happens to be the most simple and fruitful method of formulating precisely the research problem or developing hypothesis. Hypotheses stated by earlier workers may be reviewed and their usefulness be evaluated as a basis for further research. It may also be considered whether the already stated hypotheses suggest new hypothesis. In this way, the researcher should review and build upon the work already done by others, but in cases where hypotheses have not yet been formulated, his task is to review the available material for deriving the relevant hypotheses from it.

   Besides, the bibliographical survey of studies, already made in one's area of interest may as well as made by the researcher for formulating the problem precisely. He should also make an attempt to apply concepts and theories developed in different research contexts to the area in which he is working. Sometimes the works of creative writers also provide a fertile ground for hypothesis formulation and as such may be looked into by the researcher.

b) **Experience Survey** are surveys of people who have had practical experience with the problem to be studied. The object of such a survey is to obtain

insights into the relationships between variables and new ideas relating to the research problem. For such a survey, people who are competent and can contribute new ideas may be carefully selected as respondents to ensure a representation of different types of experience. The respondents so selected may then be interviewed by the investigator. The researcher must prepare an interview schedule for the systematic questioning of informants. But the interview must ensure flexibility in the sense that the respondents should be allowed to raise issues and questions which the investigator has not previously considered. Generally, the experience collecting interview is likely to be long and may last for few hours. Hence, it is often considered desirable to send a copy of the questions to be discussed to the respondents well in advance. This will also give an opportunity to the respondents for doing some advance thinking over the various issues involved so that, at the time of interview, they may be able to contribute effectively. Thus, an experience survey may enable the researcher to define the problem more concisely and help in the formulation of the research hypothesis.

c) **Analysis of In sight- Stimulating Examples** is also a fruitful method for suggesting hypotheses for research. It is particularly suitable in areas where there is little experience to serve as a guide. This method consists of the intensive study of selected instances of the phenomenon in which one is interested. For this purpose the existing records, if any, may be examined, the unstructured interviewing may take place, or some other approach may be adopted. The attitude of the investigator, the intensity of the study, and the ability of the researcher to draw together diverse information into a unified interpretation are the main features which make this method an appropriate procedure for evoking insights.

A few examples of in sight- stimulating cases are the reactions of strangers, the reactions of marginal individuals, the study of individuals who are in transition from one stage to another, the reactions of individuals from different social strata, and the like. In general, cases that provide sharp contrasts, or have striking features are considered relatively more useful while adopting this method of hypotheses formulation.Thus, in an exploratory of formulative research study which merely leads to insights or hypotheses, whatever method or research design outlined above is adopted, the only essential is that it must continue to remain flexible so that many different facets of a problem may be considered as and when they arise, and come to the notice of the researcher.

⇒ **Activity 2:** Talk with several of your extension colleagues and ask them to explain what they mean by exploratory research. Note down the difficulties involved in exploratory or formulative research studies.

3.6.2 Research Design in Descriptive and Diagnostic Research Studies

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. Studies concerning whether certain variables are associated are examples of diagnostic research studies. As against this, studies concerned with specific predictions, with the narration of facts and characteristics

concerning individuals, groups, or situations are all examples of descriptive research studies. Most of the social research comes under this category. From the point of view of the research design, the descriptive, as well as diagnostic studies share common requirements, 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 is to be measured, and must find adequate methods for measuring it, along with a clear cut definition of the population he wants to study. Since the aim is to obtain complete and accurate information in the said studies, the procedure to be used must be carefully planned. The research design must make enough provision for protection against bias, and must maximise reliability, with due concern for the economical completion of the research study.

The design in such studies must be rigid and not flexible, and must focus attention on the points that follow.

a) Formulating the objectives of the study (what the study is about, and why is it being made.)

b) Designing the methods of data collection (what techniques of gathering data will be adopted?)

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 analysing the data.

f) Reporting the findings.

In a descriptive/diagnostic study the first step is to specify the objectives with sufficient precision to ensure that the data collected are relevant. If this is not done carefully, the study may not provide the desired information.

Then comes the question of selecting the methods by which the data are to be obtained. In other words, techniques for collecting the information must be devised. Several methods (*viz.*, observation, questionnaires, interviewing, examination of records), with their merits and limitations, are available for the purpose and the researcher may use one or more of these methods .While designing a data collection procedure, adequate safeguards against bias and unreliability must be ensured. It is always desirable to pre-test the data collection instruments before they are finally used for the study purposes.

In most descriptive/diagnostic studies the researcher takes out sample(s), and then wishes to make statements about the population on the basis of the sample analysis or analyses. The task of designing samples should be tackled in such a fashion that the samples may yield accurate information with a minimum amount of research effort. Usually, one or more forms of probability sampling, or, what is often described as random sampling, are used.

To obtain data that is free from errors introduced by those responsible for collecting them, it is necessary to supervise the staff of field workers closely as they collect and record information. As data are collected, they should be examined for completeness, comprehensibility, consistency, and reliability. The data

collected must be processed and analysed. This includes steps like coding the interview replies, observations; tabulating data; and performing several statistical computations. To the extent possible, the processing and analysing procedure should be planned in detail before actual work is started. The appropriate statistical operations, along with the use of appropriate tests of significance, should be carried out to safeguard the drawing of conclusions concerning the study.

Last of all come the question of reporting the findings. This is the task of communicating the findings to others and the researcher must do it in an efficient manner. The layout of the report needs to be well planned so that all things relating to the research study may be well presented in simple and effective style.

Thus, the research design in case of descriptive/diagnostic studies is a comparative design throwing light on all points narrated above and must be prepared keeping in view the objective(s) of the study and the resources available. However, it must ensure the minimisation of bias and maximisation of reliability of the evidence collected. The said design can be appropriately referred to as a survey design since it takes into account all the steps involved in a survey concerning a phenomenon to be studied.

3.6.3 Hypothesis Testing or Experimental Research Design

These are the designs 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 also permit drawing inferences about causality.Usually, experiments meet these requirements. Hence, these are better known as experimental research designs.

According to Chapin (1955), 'the fundamental rule of the experimental method is to vary only one variable (condition) at a time, maintaining all other variables constant'. There are two reasons for adopting this procedure. Firstly, if more than one variable is varied at a time and an effect is produced, it is not possible to ascertain which variable is responsible or whether they have acted jointly. Second, when no effect is produced, it cannot be said which variable is responsible, or whether one has neutralised the other. The basic condition in experimental method is, therefore, control over the subjects of study and manipulation of the independent variables to study their effect upon the dependent variable. It is not so much the control as such, but the degree of control that one can exercise that is important.

Professor R.A. Fisher enumerated three principles of experimental designs.

i) **The Principle of Replication:** the term, replication has been derived from the fusion of two words, namely repetition and duplication. Replication refers to the deliberate repetition of an experiment, using nearly identical procedures, which may sometimes be with a different set of subjects in a different setting, and, at different time periods. It helps to revalidate a previous study, or to raise some questions about the previous studies. As each treatment is applied in many experimental units instead of one, the statistical accuracy of the experiments is increased.

ii) **The Principle of Randomisation:** Randomisation refers to a technique in which each member of the population, or, universe has an equal and

independent chance of being selected. This provides for random distribution of the effects of unknown or unspecified extraneous variables, over different groups, thus, balancing their effects to a great extent. This is a method of controlling the extraneous variables and reducing experimental error. Thus randomisation makes the test valid.

iii) **The Principle of Local Control:** Local Control refers to the amount of balancing, blocking and grouping of the subjects or the experimental units employed in the research design. The term, grouping, refers to the assignment of homogeneous subjects, or experimental units, into a group so that different groups of homogeneous subjects may be available for differential experimental treatments. The term, blocking, refers to the assignment of experimental units to different blocks in such a way that the assigned experimental units within a block may be homogeneous. The term, balancing, in a research design refers to the grouping, blocking, and assignment of experimental units to the different treatments in such a way that the resulting design appears to be a balanced one. A design, to be statistically and experimentally sound, must possess the property of local control.

3.6.4 Quasi Experimental Research Designs

These are less efficient than true experimental designs, where some, but not all, extraneous variables can be controlled. For example, there are designs in which subjects cannot be randomly assigned to conditions, but the independent variables can be manipulated, either by the investigator or by someone else. These are known as quasi experimental designs. As the subjects are not randomly assigned to the experimental and the control groups, the equivalence of the groups is not maintained, and, thus, it leaves some uncontrolled threats for validity of the experiment. Some of the important types of quasi experimental research designs are discussed below.

i) **Time series design:** let us start with an example. A business organisation each year compares its annual sales figures. After consideration of such figures for a number of years and at the advice of an expert, the management organises a training programme for its sales personnel. In subsequent years, the management, or an investigator, compares the pre-training and post-training sales figures. It may be noted here that the subjects (sales personnel) before and after training were the same, though some persons could have changed positions, or some new recruits could have been inducted. The treatment (training) could have been organized by the investigator or by the management, and there was no control group.

It shall be evident from the example that a series of pre tests are given, or pre treatment measurements are made, of the selected group or equivalent groups. Subsequently, the treatment is administered and a series of post tests are given, or post treatment measurements are made of the same group or equivalent groups. A control group or a comparison group is not included in this design. Extraneous variables such as maturation, testing, selection, and experimental mortality are well controlled. However, the variable history is not controlled. A comparison of the entire time series data, rather than figures for two adjacent time periods, better reveals the change due to treatment. This design is most applicable where testing is a regular feature of the setting, as in educational institutions, or, where data are regularly collected, such as in records of production, cost-of-living indices, etc.

ii) **Equivalent time samples design:** The design is first explained with an illustration. Suppose, the, investigator desires to study the effect of some programmes on attitude change towards the adoption of Integrated Pest Management (IPM) practices for a group of farmers. The investigator shows a film (treatment-a) to the group of students, followed by a measure of attitude towards IPM (post test-a). After a few days, the investigator briefly discusses the general beneficial effects of IPM (treatment-b) with them, and then measures their attitude (post test-b). After a lapse of few days, the same film is shown (treatment-c) to the same farmers, and measures of attitude (post test-c) are obtained. Following this, the investigator discusses in details every aspect of beneficial effects of IPM (treatment-d). The attitude of the farmers towards IPM is again measured (post tested). This is an extension of and improvement over the time-series design, because of repeated introduction of the treatments, followed by post tests every time in a systematic way. A single group is used, and there is no control group. Overall attitude change and attitude change separately, with different treatments, can be measured. As there is a carry- over of experience from one treatment to the other, it cannot be specifically stated which treatment produced what effect. The variable history, which is a major limitation of time series design, is well controlled by presenting treatments on several separate occasions. Other extraneous variables, posing threats to internal validity, are also well controlled.

iii) **Non equivalent control group design:** there are situations in which the investigator has to work with intact groups which cannot be altered. Suppose a researcher is interested in studying the impact of group discussion (treatment) on housewives' gain in knowledge about nutrition (effect). For this purpose, the researcher selects all the housewives of two separate blocks in a residential area. They form two intact non-equivalent (but comparable) groups. The treatment, a group discussion on nutrition, is arranged randomly for a block, and the other one, for which no group discussion is arranged serves as the control. Pre treatment and post treatment measurements are taken for both the groups. The design is similar to the pre test and post test control group design, except that the method of randomisation cannot be applied in the assignment of subjects to experimental and control groups. To find the treatment effect, the difference between the post test and pre test scores of the experimental and control groups may be computed. The extent to which the non-equivalent experimental and control groups are comparable may be found by comparing the scores of both the groups.

⇒ **Activity 3:** Talk with several of your colleagues and ask them to explain and illustrate the experimental and quasi-experimental research designs. Compare those designs with the examples given in this unit.

3.6.5 Pre -Experimental Research Designs

Pre-experimental research designs are research designs that are characterized by a lack of random selection and assignment. On the surface, the design below appears to be an adequate design. The subjects are pre tested, exposed to a treatment, and then, post tested. It would seem that any differences between the pre test measures and post test measures would be due to the program treatment.

a) The One-Group Pre test-Post test design experimental Group: O X O

However, there are serious weaknesses in this design. With the exceptions of selection and morality threat to internal validity, which are not factors due to the lack of a control group, this design is subject to five other threats to internal validity. If it is an historical event related to the dependent variable intervenes between the pre test and the post test, its effects could be confused with those of the independent variable. Maturation changes in the subjects could also produce differences between pre test and post test scores. If paper-and-pencil measures are used on a pre test, and a different test measure was used on the post test, a shift of scores from pre test to post test could occur, resulting in a testing threat. Regardless of the measurement process utilized, instrumentation changes could produce variation in the pre test and post test scores. Finally, if the subjects were selected because they possessed some extreme characteristic, differences between pre test and post test scores could be due to regression toward the mean. In all of these cases, variation on the dependent variable produced by one or more of the validity threats could easily be mistaken for variation due to the independent variable. The fact that plausible alternative explanation can not be ruled out makes it very difficult to say, with any kind of confidence, that the treatment given caused the observed effect. The next pre-experimental design involves comparing one group that experiences the treatment with another group that does not.

b) Experimental group: X O Control group: O

In considering this design, it is important to recognize that the comparison group that appears to be a control group is not, in the true sense, a control group. The major validity threat to this design is selection. Note that no random assignment (omission of the letter "R") is the indicator that the comparison group non-equivalent. In the above design, the group compared is picked up only for the purpose of comparison. There is no assurance of comparability between it and the experimental group. For example, we might wish to test the impact of a new type of math test by comparing a school in which the program exists with one that does not have the program. Any conclusions we might reach about the effects of the program might be inaccurate because of other differences between the two schools. Despite their weaknesses, pre-experimental designs are used when resources do not permit the development of true experimental designs. The conclusions reached from this type of design should be regarded with the utmost caution, and the results viewed as suggestive at best.

> ⇒ **Activity 4:** Identify the major differences between quasi-experimental and pre-experimental research designs

In this section, you have studied types of research design like exploratory or formulative research design, descriptive and diagnostic research designs, and hypothesis testing or experimental research designs, which are the three major categories of research designs most widely used in social science research, now answer the question given in Check Your Progress 2.

Check Your Progress 2

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit.

1) What is an experimental research design? Describe the various principles of experimental research designs

.....

.....

.....

.....

.....

2) Write the importance of pre-experimental research designs in Social Science research with suitable examples.

.....

.....

.....

.....

.....

3.7 LET US SUM UP

In this unit, we discussed the meaning, purpose and features of research designs and found that a good research design is possible through different phases. Research design, however, depends on research purpose, and is bound to be different in the case of exploratory or formulative studies from other studies, such as descriptive or diagnostic ones. Each type of research design, however, does not suit all categories of designs and for each category of research. Separate types of designs will be needed.The researcher must decide in advance of collection and analysis of data as to which design would prove to be more appropriate for his research project. The researcher must give due weight to various points such as the type of universe and its nature, the objective of his study, the resource list or the sampling frame, desired standard of accuracy, and the like, when taking a decision in respect of the design for the research project.

3.8 REFERENCES AND SUGGESTED READINGS

Festinger L.and Katn D. (1953), *Research Methods in Behavioural Sciences,* Holt, Rinehart and Winston Inc., New York.

Goode W.J.and Hatt P.K. (1981), *Methods in Social Research,* McGraw- Hill Book Company, Singapore.

Kerlinger F.N. (1973), *Foundstions of Behavioural Research,* Holt, Rinebart and Winston Inc., New York.

Kothari C.R. (1996), *Research Methodology: Methods and Techniques,* Wishwa prakashan, New Delhi.

Mulay Sumati and Sabarathanam V.E. (1980), *Research Methods in Extension Education,* Manasayan, New Delhi.

Siegel S. (1956), *Nonparametric Statistics for the Behavioural Sciences,* McGraw-Hill Book Company Inc., New York.

Young P.V. (1996), *Scientific Social Surveys and Research,* Prentice – Hall of India Pvt. Ltd., New Delhi.

3.9 CHECK YOUR PROGRESS –POSSIBLE ANSWERS

Check Your Progress 1

1) Write the important functions associated with a research design that you have come across.

Ans. Regardless of the type of research design selected by the social investigator, all plans perform one or more functions outlined and discussed below. Perhaps the most important function of research designs is that they provide the researcher with a blueprint for studying social questions. By the same token, a social researcher faces comparable obstacles if he commences his study without some kind of research plan. To minimize his research problems, there are several decisions he should make before beginning his project.

Directional function: research designs dictate boundaries of research activity, and enable the investigator to channel his energies in specific directions.

Anticipatory function: a third function of a research design is that it enables the investigator to anticipate ,potential problems in the implementation of the study

2) What are the need for research design?

Ans. 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. Even then, the need for a well thought out research design is at times not realised by many. Thoughtlessness in designing the research project may result in rendering the research exercise futile. It is, therefore, imperative that an efficient and appropriate design must be prepared before starting research operations.

Check Your Progress 2

1) What is an experimental research design? Describe the various principles of experimental research designs.

Ans. These are the designs 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 also permit drawing inferences about causality. Usually experiments meet these requirements. Hence, these are better known as experimental research designs

2) Write the importance of pre-experimental research designs in Social Science research with suitable examples.

Ans. Pre-experimental research designs are research designs that are characterized by a lack of random selection and assignment. On the surface, the design below appears to be an adequate design. The subjects are pre tested, exposed a treatment, and then post tested.