**PGED S3 01**
**Exam. Code: ERES**

# Educational Research & Educational Statistics

## SEMESTER- III

# EDUCATION

## BLOCK-1

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## COURSE INTRODUCTION (COURSE 1, BLOCK 1)

### COURSE INTRODUCTION

This course is designed for MA 3rd Semester learners who have enrolled in the Education Programme . In First and Second Semesters, we have discussed so many relevant components of education such as general understanding of education, history, issues of current education system etc. For the 3rd Semester, there are a total of 4 courses namely Research methodology, Distance education, Teacher Education and psychological Practical. In this course which is PGED S 3-01, will shall discuss basic components of research methodology, tools and techniques in the first block of the course and in the 2nd block, we shall discuss the statistical part.

### BLOCK INTRODUCTION

In this first block there are 8 units. The *First Unit* deals with the meaning, nature, types, steps and ethics of research . The *Second Unit* deals with the basic concept of hypothesis and its types. The Third and the Fourth Units discusses the research methods in details. *The Fifth Unit* discusses the various tools which are used for doing or conducting research. The *Sixth Unit* deals about sampling. The *Seventh Unit* explains the concept and relavance of actin research. The Eight Unit discusses the reserach design.

While going through a unit, you will notice some along-side boxes, which have been included to help you know some of the difficult, unseen terms. Some “ACTIVITY’ (s) have been included to help you apply your own thoughts. Again, we have included some relevant concepts in “LET US KNOW” along with the text. And, at the end of each section, you will get “CHECK YOUR PROGRESS” questions. These have been designed to self-check your progress of study. It will be better if you solve the problems put in these boxes immediately after you go through the sections of the units and then match your answers with “ANSWERS TO CHECK YOUR PPROGRESS” given at the end of each unit.

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# UNIT 1: RESEARCH

## UNIT STRUCTURE


1.1 Learning Objectives

1.2 Introduction

1.3 Meaning of Research and Features of Research

1.4 Meaning of Social Research and Educational Research

1.5 Types of Research

1.6 Steps in the Research process

1.7 Ethics in social research

1.8 Let Us Sum Up

1.9 Further Reading

1.10 Answer to Check Your Progress

1.11 Possible Questions


## 1.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- know the meaning of research
- know the type of research
- know the steps in the research process.

## 1.2 INTRODUCTION

Different disciplines are engaged with the task of unravelling the hidden truths through research. Research employs various methods to unravel truth. On the basis of their object of inquiry all the disciplines employ different methods . In the subsequent chapters we will learn about different methods employed by sociologists and educationists while doing research. But before knowing the various methods of research it is pertinent to understand the meaning of research, different types of research and the ethics required while conducting a research. Therefore, in this unit we shall discuss what is meant by research, different types of research and the ethics required to undertake a research.

## 1.3 MEANING OF RESEARCH AND FEATURES OF RESEARCH

Research is a systematic and scientific inquiry to find new knowledge and question the validity of the existing knowledge.

According to Webster, 'Research is a studious inquiry or examination-critical and exhaustive investigation or experimentation having for its aim the discovery of new facts and their correct interpretation'. From this definition it can be said that research is a careful critical inquiry or examination in seeking facts and principles; diligent investigation in order to ascertain something.

**O. Slesinger and M. Stephension** in 'The Encyclopaedia, of social sciences define research as "the manipulation of things, concepts or symbols for the purpose of generalising to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practise of an art'.

According to **L.V Redman and A.V. H.Mory,** 'a systematised effort to gain new knowledge we call research'.

**Features of Research:** Some of the features of research is enumerated below:

- Research aims to discover and diffuse knowledge.
- Research is directed to discover the solution of the existing problems
- Research aims for the development of theories
- Research is based on empirical evidence.



**LET US KNOW**

According to Encylopedia Britannica, 'Scientific method is a collective term denoting the various processes by the aid of which sciences are built up. In a wide sense, any method of investigation

## 1.4 MEANING AND DEFINITION OF SOCIAL AND EDUCATIONAL RESEARCH

According to **Pauline V. Young**, 'social research may be defined as a scientific undertaking which, by means of logical and systematised techniques aims to: i) discover new facts or verify and test old facts ii) analyse their sequences, interrelationships, and causal explaination… iii) develop new scientific tools, concepts and theories which would facilitate reliable and valid study of human behaviour'.

According to O.R Krishnaswami and M. Ranganathan, 'Social sciene research is a systematic method of exploring, analyzing and conceptualizing human life in order to extend, correct or verify knowledge of human behaviour and social life'.

According to **Wallace** and **Wallace**, 'Sociological research refers to the structural observation of social behaviour'.

Educational reserach is a part of social science research, but the major dimension or the focus of the research is to deal with the educational issues and problems so that necessary action can be taken for the improvement of the educational enviornment. Educational researchers may draw upon a variety of disciplines including psychology, economics, sociology, anthropology, and philosophy. Educational research refers to the systematic collection and analysis of data related to the field of education. Research may involve a variety of methods and various aspects of education including student learning, teaching methods, teacher training, and classroom dynamics etc.

**General Characterstics of Educational Research:**

Gary Anderson outlined ten aspects of educational research, which are as follows:

- Educational research attempts to solve a problem.
- Research involves gathering new data from primary or first-hand sources or using existing data for a new purpose.
- Research is based upon observable experience or empirical evidence.
- Research demands accurate observation and description.

- Research generally employs carefully designed procedures and rigorous analysis.
- Research emphasizes the development of generalizations, principles or theories that will help in understanding, prediction and/ or control.
- Research requires expertise—familiarity with the field; competence in methodology; technical skill in collecting and analyzing the data.
- Research attempts to find an objective, unbiased solution to the problem and takes great pains to validate the procedures employed.
- Research is a deliberate and unhurried activity which is directional but often refines the problem or questions as the research progresses.
- Research is carefully recorded and reported to other persons interested in the problem.

## 1.5 TYPES OF RESEARCH

Research can be classified into the following categories

- **Basic and Applied Research:** Those research which are concerned with generating or seeking knowledge just for the sake of knowing are known as pure or basic research. This kind of research is in quest of new knowledge. This kind of research is not concerned with the practical utility of the research. Such research generally leads to the development of concepts and terminologies. On the other hand the sole aim of applied research is to analyse and discover the solution of an existing social problem. For example if some one tries to understand the cause of increasing delinquency among the children then it will come under the domain of pure or basic research. But if some one tries to find how delinquent behaviour can be rectified then it will come under the purview of applied research. Applied research is extensively employed for planning and designing policies by the government. For example the government conducts extensive research to understand the persistance of the problem of maternal mortality. On the basis of the research the government design requisite policies.
- **Descriptive and Analytical Research:** The research which intends to describe a social situation, social event and the society itself is known

as descriptive research. The main purpose of such research is to provide intricate details of a particular social context. In this type of research a researcher does not have any control over the variables and therefore they record what has happened or what is happening. But in case of analytical research, a researcher has to make use of the available facts and then critically analyse those facts. This kind of research is conducted with the assumption that a critical examination of the facts and figures will reveal more than what they appear when observed casually. So a researcher tries to discover the connection between the collected facts and figures to draw generalisations from them. This kind of research usually tries to establish cause-and effect relationship. For example if a researcher is trying to understand a particular social context he/she will try to discover the causes which gives rise to the events (say suicide) and the effect of those events. However one needs to remember that even in descriptive research some preliminary analysis can be found and similarly in the analytical researches some kind of description can be found.



***PARADIGM:***

According to the Oxford dictionary of Sociology, 'the word Paradigm designates a typical example or model to be replicated or followed'.

- **Emperical and Exploratory Research:** Emperical research is based on experiences and the observations. Such research begins with an assumption and they try to examine that assumption. These research provide a conclusion which can be verified by further observation and experimentation. However in exploratory research, a researcher has restricted knowledge about the object of inquiry. This kind of research has been proved useful in understanding problems like corruption, problems in the functioning of the educational institutes, harassment by police etc. These kinds of research have enabled the researchers to discover diverse dimensions of a problem.
- **Experimental and Evaluative Research:** Experimental researches are generally conducted in controlled environment. In a controlled environment a researcher is able to manipute the independent variable to study its impact over the dependent variable variables. In these researches indentification of the independent and the dependent variable is important. These researches require precisely observing and carefully

measuring that observation to draw conclusion. Such experiments can be conducted in laboratories but social researches cannot be conducted in laboratories. Therefore some social researchers rely on quasi-experimental research. To conduct such research, researchers look out for situations where there is a possibility of observing as well as measuring the impact of isolated variables. In quasi experimental research external control over the variables is not employed. For example a research on discplacement due to the construction of dams could be a quasi-experiment. On the other hand those researches which are conducted with an intention to evaluate progrmmes and policies, their effectiveness etc are known as evaluative researches.

- **Participatory Action Research (PAR):** According to Gstaven, the practical orientation is the defining feature of a PAR. These researches aims at solving the practical problems that arise in work or organisational setups. So these researches try not only to deal with the problems but also tries to discover the means to bring in changes. To introduce change this research relies on feedback of people which are evaluated and then implemented. This research involves two stages. First, the research is carried out and in the second stage the knowledge gained is applied.
- **Explainatory (causal) and Longitudinal Research:** Explainatory research tries to establish the relation between different variables. It is mainly concerned with the 'why' aspect of a phenomenan. For example a research on juvenile delinquency would seek to question why children commit crime. On the other hand a longitudinal research seeks to study same variables (may be a group of people, a school, one hospital etc) repeatedly for a long period of time over some time interval.
- **Qualitative Research and Quantitative Research:**
  - **Qualitative Research:** Those research where the data cannot be reduced to numbers are known as qualitative research. Qualitative research focuses on careful and detailed descriptions of social practices in an attempt to understand how the participants experience and explain their own world. The tools for gaining

information include- participant observation and in-depth interview.

In qualitative research, findings are typically expressed by quoting interviews or relating experiences which a researcher has had in the field. Qualitative research aims at understanding the subtle nuances of attitudes and behavior, understanding social processes over a long period of time. It requires studying people in their natural setting. John and Lyn Lofland discusses several aspects of social life whose study fall under the purview of qualitative research.

- **Qualitative Research Paradigms:** Understanding the various aspects of social life requires a researcher to go beyond the superficial reality. Therefore in order to understand the different aspects of society qualitative research paradigms are preferred more. Two mostly used qualitative research paradigms are discussed in the next section.
  - **Naturalism:** It is one of the oldest qualitative methods. This research is based on the assumption that any social reality can be understood only in the natural setting. This paradigm was employed for the first time in the Sociology department of the University of Chicago during 1930s. One of the famous studies which falls under the ambit of qualitative research is William Foote Whyte's work which was published in the book, 'Street Corner Society' in the year 1943. This type of research tries to understand the reality as it is or in other words it is understood from the perspective of those being studied and not how the researcher understands them.
  - **Ethnomethodology:** It is another qualitative research paradigm. Ethnomethodologists argue that that the researchers who employ naturalistic research tend to lose the capacity to analyse the commonsensical world of those being studied, if the analytical tools and insights are also borrowed from those being studied. The basic difference between naturalism and ethnomethodology is that naturalists try to understand the social reality as the participants understand but ethnomethodologists are interested in recognising the 'methods' through which understanding occurs.

- **Advantages of Qualitative Research:**
  - It provides flexibility to a researcher to conduct an in depth study on a particular topic.
  - The methods opted by qualitative research enables a researcher to encounter with the unknown domains of knowledge.
  - Qualitative research is considered 'relatively' inexpensive
- **Disadvantages of Qualitative Research:**
  - Qualitative research is often criticized on the ground that in such a research the researcher tend to get subjectively involved with the object of inquiry.
  - Qualitative research is not replicable and therefore it is criticized on the ground that qualitative research is not often generalizeable.
  - Another limitation of qualitative research is that here the data collection process is more time consuming.
  - **Quantitative Research:** The research where the data collected is measureable or quantifiable is known as quantitative research. In this type of research different statistical methods are used to explain the observation and to arrive at the conclusion. Quantitative research seeks to quantify or reflect with numbers, observations about human behaviour. This kind of research attempts to describe relationships among the variables mathematically and to apply some form of numerical analysis to the social relations being examined.The survey method and experimental methods are examples of quantitative methods.
- **Unobtrusive Research:** Social research involves studying social situations. While studying social situation intentionally or unintentionally a researcher intrudes into the situation under study. But the research methods which does not require intrusion on the part of the researcher is known as unobtrusive research. Emile Durkheim's study on Suicide is a classic example of this type of study. While he was analysing suicide he did not influence suicide in anyway. Unobtrusive research can be both quantitative and qualitative. Three major unobtrusive research methods are: content analysis, comparative research method and

historical research method.

- **Content Analysis:** These researches intends to study social phenomenon through recorded human communication made available in the form of books, magazines, web pages, poems, newspaper, songs, paintings, speeches, television programmes, letters, billboards, internet sites and posts etc. In this method, data is collected through careful analysis of 'what' is being communicated, 'why' it is communicated', 'what' is its effect.
- **Comparative method:** This is one of the oldest method of generating data in social science. This method compares the cultural traits of two or more cultures and then gauge the 'progress' of the societies.
- **Historical method:** The historical method generates data regarding the present condition of a society by going back to its past and analysing the various aspects of that society in different periods of history. In this method three important sources of information are: various preserved historical documents, materials of cultural history, personal sources like dairies, letters of witness of the historical events.



**CHECK YOUR PROGRESS**

**Q 1:** a) What is the full form of PAR.

.....

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b) Mention two types of research.

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## 1.6 STEPS IN THE RESEARCH PROCESS

Investigating an object of inquiry requires following certain steps

which makes the research more systematic and authentic. The steps are briefly discussed below:

- **Identification of the problem:** The first step in every research is to first identify the problem which will be the focus of the investigation. Articulation of the problem becomes the research question of the study. For example, a researcher might identify increasing delinquency as a problem and might pursue it further as his/her object of inquiry.
- **Review of literature:** After identifying the focus of the research, a researcher has to start reviewing the works already done in that topic. This step helps a researcher to attain more knowledge about the subject. A researcher becomes aware of the kind of works that has been already done in that area, how those studies were done, the problems that researchers had to encounter while studying them etc. Since it is called a 'review' a researcher should not merely read works but has to identify the limitations or the unexplored arenas of those studies and accordingly they should give attention to the limitations and the unexplored arenas.
- **Formulating a hypothesis:** The knowledge gained through review of literature helps a researcher to develop a clarity regarding the problem. Therefore in the third step the researcher defines the problem and the scope of the study. In this stage the researcher atrticulates the hypothesis of a study. According to Franscis Abrahim, 'a hypothesis is a statement of the relationship between two or more variables'. For example, a researcher states that there exists a relationship between low level economic development and increase in youth unrest. While formally stating the problem or the hypothesis of the study, the researcher is required to define the concepts. For instance in the example cited above one is required to provide measurable definition of the variables like economic development, youth, youth unrest etc.
- **Selecting a research design:** The next step in a research process is to carefully formulate an effective research design. A research design is dependent on the kind of research an individual is willing to undertake or the objective of the research. In the previous section we have read about different types of research like quantitative, qualitative,

experimental, exploratory etc. So if a researcher intends to undertake qualitative research he or she has to rely on the data received from people through interviews and observation. This form of data cannot be converted into numerical form and it therefore requires careful interpretation.

- **Collection of data:** On the basis of the type of research, one has to select the appropriate 'tools' and 'techniques' of collecting data.In any type of research the most important aspect is accurate recording of the data. On the basis of the type of research, the site for collecting data will vary. In social science research the site for collecting data is society itself. But in case of research in physical science data is recorded in laboratory or controlled situation.
- **Analysis of data:** After the data is collected, a researcher is required to examine them to see whether his or her hypothesis is confirmed or rejected. Again, some data also lead to unknown and unexpected knowledge.
- **Writing a report:** After the data has been analysed, a researcher prepares a comprehensive report of the findings. The report must include the methods employed in undertaking the research, the tools used, the findings and also the shortcomings of the research. This helps in opening up the work for further research in that particular area and also helps in examining the reliability and validity of the research.



**LET US KNOW**

**Reliability and validity:** According to M. Franscis Abrahim, 'Reliability refers to consistency in measurement. A realiable instrument will produce the same result with repeated measurement'. But an instrument can be reliable without being valid. This implies that a measuring scale with an inch missing will always give the same result. But that result will not be valid.

## 1.7 ETHICS IN SOCIAL RESEARCH

Ethics generally implies those moral principles which govern an individual's behaviour and accordingly the activities performed by him or her.

Webster's Dictionary defines ethical behaviour as, 'conforming to the standards of a conduct of a given profession or group'.

But what is to be considered as right or wrong may vary from person to person and group to group. Ethics are important while conducting research also. According to the Oxford Dictionary of Sociology, research ethics refers to, 'the application of moral rules and professional codes of conduct to the collection, analysis, reporting, and publication of information about research subjects, in particular active acceptance of subject's right to privacy, confidentiality, and informed consent.' According to the early sociologists the primary ethical goal of the discipline was to improve society's understanding of itself and not to determine the specific direction or to develop technology for social change.

According to the contemporary sociologists the most important ethical goal is to stimulate consciousness. According to them social engineering on the basis of private and parochial interest is ethically most objectionable.

Resolution of ethical issues is important in sociological research too. Sometimes studies which have no adverse personal consequences for individual respondents may have undesirable social impact and vice-versa. This becomes ethically objectionable. Some studies conducted by sociologists with exemplary motives have given rise to ethical controversies. For example Roserham in his study of mental institutions in the year 1973 had placed observers in the wards without the knowledge or consent of the authorities in the institution. As a result though his study came up with very important data regarding improper care of the patients in the institution, his research was declared fraudulent because the deception and manipulation of his subjects (hospital staff) was undeniable.

Some ethical consideration for conducting sociological study are :

- Full disclosure of motivations for and the background of the research: The researchers should not misuse their positions as professional social researchers for fraudulent purposes on the pretext of collecting information for any organisation or government. A sociologist must also inform about the sources of financial support in their publications and must reveal any (if) special relation to any sponsor.
- Avoidance of any harm to the research subjects with special emphasis on keeping the identity of the respondents confidential: This is another important ethical concern in a research. A researcher must ensure to maintain the anonymity of the respondents. A researcher must take extra precaution in making and adhering to commitments. Again, researchers should not make any guarantees to respondents, individuals, groups or organisations, unless there is full intention and ability to fulfill such commitments. If guarantees, are made, they must be honoured.
- Qualifications to the technical expertise: As a domain of professional ethics, a researcher is required to explicitly state the short comings of his/her methodology and must make his/her findings explicit for varying interpretation.



**CHECK YOUR PROGRESS**

**Q 2:** a) Mention the different steps in a research process.

.....

.....

b) What is meant by ethics?

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## 1.8 LET US SUM UP

- Research is a systematic and scientific inquiry to find new knowledge and question the validity of the existing knowledge.
- Research aims to discover and diffuse knowledge.
- Researches are directed to discover the solution of the existing problems.
- Research aims for the development of theories.
- Researches are based on empirical evidence.
- There are different types of research on the basis of the objective of the research.
- The research process involves a number of steps like identification of problem, review of literature, formulating a hypothesis, selecting a research design, collection of data, analysis of data, and finally writing a report.
- While conducting a research following a set of ethics is very important.



## 1.10 FURTHER READING

1) Abraham, Francis M. 2006. Contemporary Sociology: An introduction to concepts and theories. New Delhi: OUP
2) Babbie, Earl. 2007. Research Methods in Sociology. New Delhi: Sai Print
3) Young, P.V. 1966. Scientific Social Surveys and Research. New Delhi: PHI Learning



## 1.9 ANSWERS TO CHECK YOUR PROGRESS

**Answer to Q. 1 :**

a) Participatory Action Research
b) Experimental and Evaluative Research

**Answer to Q. 2 :**

a) Identification of problem, review of literature, formulating a hypothesis, selecting a research design, collection of data, analysis of data, and finally writing a report.

b) Ethics generally implies those moral principles which govern an individual's behaviour and accordingly the activities performed by him or her.

## 1.11 POSSIBLE QUESTION

**A. Short types Questions** (Answer within 150 words)

**Q 1:** Define social research

Q **2:** Explain the meaning and characteristics of educational research

**Q 2:** Mention the features of a research

**B. Long type Questions** (Answer within 350-500 words)

**Q 1:** Explain the different types of research.

**Q 2:** Discuss the ethics required to conduct a research.

*** ***** ***

# UNIT 2: HYPOTHESIS

## UNIT STRUCTURE

2.1 Learning Objectives

2.2 Introduction

2.3 Concept of Science and Theory

2.4 Concept of Hypothesis

2.5 Types of Hypothesis

2.6 Let Us Sum Up

2.7 Further Reading

2.8 Answer to Check Your Progress

2.9 Model Questions

## 2.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- explain the concept of theory, science and scientific research
- explain the concept and features of Hypothesis
- discuss the types of hypothesis

## 2.2 INTRODUCTION

In the previous unit, we discussed the basic concept of research suchan meaning and concept of research, research ethics and its various types. In this unit, let us discuss the various issues related to theory, scientific research and hypotheses. We all know that humans quest for knowledge. But knowledge should be based on scientific foundation and philosophy of science. If we look at the scientific assumptions of research, it seems that there are some important characteristics or approaches of scientific research such as -(1) Nature is orderly (2) We know nature (3) Knowledge is superior to ignorance (4) All natural phenomena have natural causes and natural effects (5) Nothing is self-evident and (6) Knowledge is based on experience, it may be in the laboratory or in field or both. Thus, it could be stated that knowledge is scientific, unassailable in terms of scientific methodology,

conclusions may not universally acceptable, but methodology must be flawless. So, in order to derive a scientific result there should be some systemic methodology while conducting research in any sector whether it is in experimental research, or in descriptive or qualitative research and other social science researches. Hypothesis guide and direct the researchers to verify or test the result of the problems and variables in order to finalize or establish the truth or the fact in an empirical way.

## 2.3 CONCEPT OF THEORY

The first question that comes into our mind is why to we need scientific approach for doing a research? Scientific approach helps us in acquiring reliable knowledge about human experience that are considered 'economical', 'social' 'political' or 'psychological'.

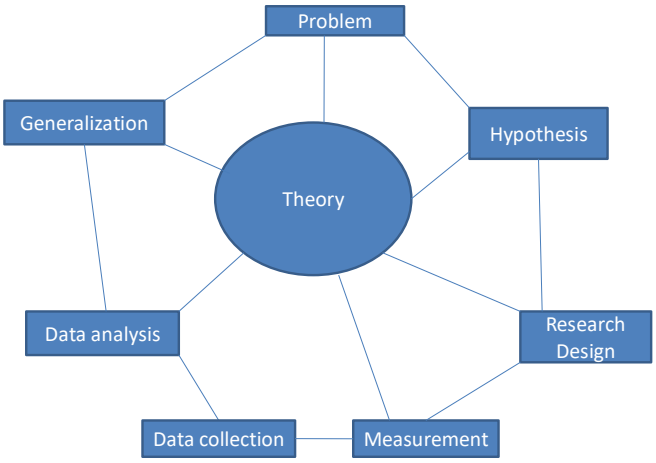
Let us first define science. Science cannot be defined easily. Laymen, journalists, policy makers, scholars, scientists, define science differently. Some people state that it is highly prestigious some others state that it implies a body of true knowledge. Still some others take it to be an objective investigation of empirical phenomena. The word 'science' is derived from a Latin word, 'scire' i.e. 'to know'. Any attempt to know through a methodology the body of knowledge thus acquired is science. There are three general modes that have served the purpose of acquiring knowledge, (i) authoritarian mode, (ii) mystic mode and (iii) rationalist mode. The last one leads us to reliable and testable knowledge. It is based on the philosophy that holds that the totality of knowledge can be obtained by strict adherence to the forms and rules of logic.

In fact, the goal of both pure and social sciences is to produce a body of reliable knowledge which enables us to explain, predict and understand empirical phenomena that interest us. A reliable body of knowledge could be used to improve the human condition, build human civilization. Thus, if we look at the stages of research process then it seems that it follows systemic procedures/stages for conducting a research. Science is united by methodology and not by matter. Methodology means

a system of explicit rules and procedures on which research is based where claims for knowledge is evaluated. Besides, methodology should be followed by logic and reasoning.

**Stages of research process:**

Methodology: Stages of research process




One of the most important functions of research is to contribute to the development and refinement of theory. Because theory enhances the goals of science - towards building knowledge capital. Theory means differently. Some treat it as conceptualization, such as, power, social status, bureaucracy, relative deprivation, relativity, gravitation. When these are interpreted with empirical situation it becomes theory. For example, when we interpret power in an Indian political setting, it becomes a theory. That means a concept applied in real situation is theory. Some argue - it is equated with history of ideas. Others say it is a logical-deduction-induction system.

**Theory in research:**

- A sound theory is a foundation for reliable knowledge. From that foundation, one can find new frontiers of research.
- Theory helps explain and predict phenomena of interest to us.
- Theory is not philosophy. For example, writings of Plato, John Locke, Adam Smith, Marx are philosophies. But David East's presentation of the political system is a theory.
- Theory should come first, to be followed by research strategy. Karl Popper, The Logic of Scientific Discovery (New York: Science Edition,

1961) argues that theory provides the platform for scientific research.

**Strategies of a theory:** Formulating a theory of follows certain strategies, such as:

- Construct an explicit theory or concept or model or idea.
- Select proposition(s) [hypothesis/hypotheses] derived from the theory or model for empirical investigation.
- Design a research project to test the propositions.
- If the propositions are rejected by empirical data, make changes in the theory.
- If the propositions are confirmed, a tested theory is built and universally accepted.
- Investigate a phenomenon and delineate or explain in details the attributes.
- Measure attributes in a variety of situations.
- Analyze the resulting data to determine if there are systematic patterns of verification.
- Once systematic patterns are discovered, construct a theory.

Thus, all strategies regard a theory as the manifestation of scientific progress. Empirical research goes beyond the passive role of verifying and testing theory. Research is more than to confirm or refute proposition. It plays an active role; it initiates, formulates, deflect and clarifies theory. Empirical research suggests new problems for theory. Sciences, social sciences, humanities have progressed in spite of this controversy. Theories are free creations of mind. Theories may not be suggested by observational materials. Theories help guide research activities. And theory building at the end of the research is a precise contribution to the world of knowledge.

Theory originates from hypothesis - pre-thesis, intelligent guess, a tentative answer to a problem in the form of a relationship between independent variable and dependent variable. Hypotheses are tentative answers. Hypotheses are derived deductively from theories, directly from observations, intuitively, or combination of all.



**CHECK YOUR PROGRESS**

**Q 1:** What is Theory?

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**Q 2:** What is Science?

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## 2.4 CONCEPT OF HYPOTHESIS

A **hypothesis** (plural **hypotheses**) is a proposed explanation for a phenomenon. For a hypothesis to be a scientific hypothesis, the scientific method requires that one can test and retest it. Scientists generally base scientific hypotheses on previous observation that cannot satisfactorily be explained with the available scientific theories. Even though the words "hypothesis" and "theory" are often used synonymously, a scientific hypothesis is not the same as a scientific theory. A working hypothesis is a provisionally accepted hypothesis proposed for further research and enquiry in a process beginning with an educated guess or thought.

**What is Research Hypothesis?**

**A research hypothesis is a prediction of the outcome of a study. The prediction may be based on an educated guess or a formal theory. A hypothesis (H)** is an unproven statement or proposition about a factor or phenomenon that is of interest to the researcher. It may be a tentative statement about the relationships discussed in the theory or analytical framework or represented in the analytic model. The hypothesis can also be stated as a possible answer to the research question. Hypotheses are statements about proposed relationships rather than merely questions to be answered. They reflect the researchers' expectation and can be tested empirically. Hypotheses also plays an important role of suggesting variables to be included in the research design.

There are four common characteristics of hypotheses, which are as follows:

- Hypothesis must be clear and logically sound,
- It must be value free
- Hypothesis should be specific and
- It should be amenable to empirical testing.

Features of a good Hypothesis:

- A hypothesis must be conceptually clear. All the concepts used in a hypothesis must be clearly defined.
- A hypothesis must be empirically testable.
- A hypothesis must be specific and precise. The possible relationships among the variables must be precisely stated in a hypothesis.
- A hypothesis must be consistent with known facts.
- A hypothesis must have a theoretical orientation. A good hypotehesis must be able to support or refute (deny) an existing theory of social relations.
- A hypothesis must be clear, definite and stated in a simple manner.
- A hypothesis must have reasonbale explanation to any problem in the present state of knowledge.
- It must be adequate for its purpose.
- It must be testable
- It must be better than its rival.

**Advantages of Hypothesis:**

- A hypothesis forces us to think more deeply and specifically about the possible outcomes of a study. It enables us to understand what the question implies and exactly what variables are involved.
- If one is attempting to build a body of knowledge in addition to answering a specific question, then stating the hypothesis is a good strategy because it enables one to make specific predications based on prior evidence or theoretical argument.
- Hypothesis stating helps us to see if we are or are not investigating a relationship.

**Disadvantages of Hypothesis:**

- Stating a hypothesis may lead to a bias, either consciously or unconsciously, on the part of the researcher. This is because the researcher may be tempted to arrange the procedures or manipulate the data in such a way to bring about a desired outcome. This depends on the honesty of the researcher.
- Stating a hypothesis may sometimes be unnecessary or even inappropriate in certain research projects or certain types of researches such as qualitative research, descriptive research and ethnographic research.



**CHECK YOUR PROGRESS**

**Q 3:** What is Hypothesis?

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**Q 4:** State four important characteristics of a good hypothesis.

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## 2.5 TYPES OF HYPOTHESES

If we look at the hypotheses for Quantitative Research, it basically reveals:

- Educated guess or presumption based on literature
- States the nature of the relationship between two or more variables
- Predicts the research outcome
- Study designed to test the relationship described in the hypothesis

**Hypotheses and Variable**

- Variable
  - Element that is identified in the hypothesis or research question.
  - Property or characteristics of people or things that varies in quality or magnitude.

- Must have two or more levels.
- Must be identified as independent or dependent.

**Types of Hypothesis:**

*Null Hypotheses:* It is the reverse of research hypothesis. In the null form, the researcher makes a statement that no significant difference exists between the variables concerned. If we are to compare method A with method B about its superiority and if we proceed on the assumption that both methods are equally good then this assumption is termed as the null hypothesis. For example: "There is no significant difference between the academic achievement of high school athletes and that of non athletes". It is an example of null hypothesis. In fact, null hypothesis implies:

- Implicit complementary statement to the research hypothesis.
- No relationship/difference exists between variables
- Statistical test performed on the null.
- Assumed to be true until support for the research hypothesis is demonstrated.

**For example:**

**Version A of the null hypothesis:**

There is no true difference between the two groups.

**Version B of the null hypothesis:**

The true difference between the two groups is zero.

Significance tests determine the probability that the null hypothesis is true. Suppose, for our example, we use a significance test and find the probability that the null hypothesis is true is less than 5 in 100; this would be stated as $p < .05$, where p obviously stands for probability.

Of course, if the chances that something is true are less than 5 in 100, It's a good that it's not true. If it's probably not true, we reject the null hypothesis.

There is no rule of nature that dictates at what probability level the null hypothesis should be rejected. However, conventional wisdom suggests that .05 or less (such as .01 or .001) is reasonable. Of course, the researchers should state in their reports the probability level they used to determine whether to reject the null hypothesis.

Note that when we fail to reject the null hypothesis because the probability is greater than .05, we do just that: we "fail to reject" the null hypothesis.

***Directional hypothesis***

- Precise statement indicating the nature and direction of the relationship/ difference between variables.
- A directional hypothesis is one in which the specific direction (such as higher, lower, less or more) that a researcher expects to emerge in a relationship is indicated. The particular direction expected is based on what the researcher has found in the literature, from personal experiences, or from the experiences of others.

**Hypothesis for a non-experimental study**

We can cite an example, say: it is hypothesized that girls will show better performance in SLM development than boys.

The researcher is predicting that he/ she predicts better performance among girls than boys. To test this hypothesis, a non-experimental study would be appropriate because nothing in the hypothesis suggests that treatments will be given.

**What the research hypothesis predicts?**

A simple research hypothesis predicts a relationship between two variables. The two variables in the above mentioned Example are (1) gender and (2) performance in developing SLM. The hypothesis states that performance in developing SLM is related to gender.

**Hypothesis for an experimental study**

**It is hypothesized that boys who are shown a video with violence will be more aggressive on the playground than those who are shown a similar video without violence.**

In this example, the independent variable is violence and the dependent variable is aggressiveness on the playground.

The Examples of experimental and non-experimental study are the examples of directional hypotheses. In a directional hypothesis, we predict which group will be higher or have more of something.

**Non-directional hypothesis**

- States only that relationship/difference will occur.
- For example, it is hypothesized that academic counselling sessions held in KKHSOU are different from that of State Open Universities in India.
- The researcher predicts that there will be a difference but does not predict the direction of the difference.
- Therefore, instead of a non-directional hypothesis, we might state a research purpose.

  **If we look at the example of Research purpose it might provide us the specific direction.** The purpose of this research is to explore the differences in academic counselling held in KKHSOU and other Open Universities in India, which provides the purpose of the specific study.
- Another example of non-directional hypothesis is "It is hypothesized that learners of open university and learners of conventional university differ in their attitudes toward distance education."

  The choice between a **non-directional hypothesis, a research purpose, and a research question,** is purely a matter of personal taste- all are acceptable in the scientific community. Of course, if you are interested to predict the outcome of a study, you should state a **directional hypothesis.**

**Hypotheses and nature of enquiry**

- Descriptive -
  testing whether an effect is apparent or not.
- Inferential -
  testing whether two or more sets of already determined data are related or not; testing whether two or more sets of data can provide new data.
- **Declaratory hypotheses - example:** there is a relationship between globalization and increasing poverty in absolute figure when quantified or there is a positive relationship between US concept of regime change and its greed for oil.

- **Question-type hypotheses -** Is there a positive or negative relationship between centre's policy of development and the emergence of insurgency movements in North East India?
- **Statement type of hypotheses -** Technological development in a society has a relationship with better agricultural production.

**Research Question**

A research question may also be substituted for a non-directional hypothesis. This example shows a research question that corresponds to the non-directional hypothesis.

**The research question is "How do the academic counselling in KKHSOU and NSOU differ?"**

When using a research question as the basis for research, we usually should be careful not to state it as a question that can be answered with a simple "yes" or "no".

**The question is, "Does the academic counselling in KKHSOU and NSOU differ?**

This example merely asks "do they differ?" This is not a very interesting research question. Example 5 is superior because it asks "how do they differ?"



**LET US KNOW**

Types of Variables:

**Independent Variables-**

- Manipulation or variation of this variable is the cause of change in other variables.
- Technically, independent variable is the term reserved for experimental studies.
- Also called antecedent variable, experimental variable, treatment variable, causal variable, predictor variable.

**Dependent Variables**

The variable of primary interest

- Research question/hypothesis describes, explains, or predicts

changes in it.

- The variable that is influenced or changed by the independent variable.
- In non-experimental research, also called criterion variable, outcome variable.



**CHECK YOUR PROGRESS**

**Q 5:** What does null-hypothesis mean?

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## 2.6 LET US SUM UP

- Scientific approach helps us in acquiring reliable knowledge about human experiences that are considered 'economical', 'social' 'political' or 'psychological'.
- Science cannot be defined easily. Laymen, journalists, policy makers, scholars, scientists, define science differently. Some take it to be highly prestigious, some others take it to be a body of true knowledge. For some, it means an objective investigation of empirical phenomena.
- The word 'science' is derived from a Latin word, 'scire' i.e. 'to know'. Any attempt to know through a methodology which is unassailable in approach and steps and the body of knowledge thus acquired is science.
- In fact, the goal of both pure and social sciences is to produce a body of reliable knowledge which enables us to explain, predict and understand empirical phenomena that interest us.
- A reliable body of knowledge could be used to improve the human condition, build human civilization. Thus, if we look at the stages of research process then it seems that it follows systemic procedures/ stages for conducting a research.
- Science is united by methodology and not by matter.

- One of the most important functions of research is to contribute to the development and refinement of theory. Because theory enhances the goals of science - towards building knowledge capital.
- Theory means differently. Some treat it as conceptualization, such as, power, social status, bureaucracy, relative deprivation, relativity, gravitation. When these are interpreted with empirical situation it becomes theory.
- Theory originates from hypothesis - pre-thesis, intelligent guess, a tentative answer to a problem in the form of a relationship between independent variable and dependent variable.
- Hypotheses are tentative answers. Hypotheses are derived deductively from theories, directly from observations, intuitively, or combination of all.
- A research hypothesis is a prediction of the outcome of a study. The prediction may be based on an educated guess or a formal theory.
- A hypothesis (H) is an unproven statement or proposition about a factor or phenomenon that is of interest to the researcher. It may be a tentative statement about the relationships discussed in the theory or analytical framework or represented in the analytic model.
- The hypothesis can also be stated as a possible answer to the research question. Hypotheses are statements about proposed relationships rather than merely questions to be answered. They reflect the researchers' expectation and can be tested empirically.
- Types of hypothesis are: Null-hypothesis, directional and non-directional hypothesis, experimental and non-experimental hypothesis, declaratory hypothesis, question type hypothesis, statement type hypothesis etc.



## 2.7 FURTHER READING

1) C R Kothari (2004). Research Methodology: Methods and Techniques
2) Dr. Shanti Bhushan Mishra & Dr. Shashi Alok (). Handbook of Research Methodology, A Compendium for Scholars and Researchers, Educreation Publishing, New Delhi.

## 2.8 ANSWERS TO CHECK YOUR PROGRESS

**Answer to Q. 1:** One of the most important functions of research is to contribute to the development and refinement of theory. Because theory enhances the goals of science - towards building knowledge capital. Theory means differently. Some treat it as conceptualization, such as, power, social status, bureaucracy, relative deprivation, relativity, gravitation. When these are interpreted with empirical situation, it becomes theory. For example, when we interpret power in an Indian political setting, it becomes a theory. That means a concept applied in real situation is theory. Some argue - it is equated with history of ideas. Others say it is a logical-deduction-induction system.

**Theory in research:**

- A sound theory is a foundation for reliable knowledge. From that foundation, one can find new frontiers of research.
- Theory helps to explain and predict phenomena of interest to us.
- Theory is not philosophy. For example, writings of Plato, John Locke, Adam Smith, Marx are philosophies. But David East's presentation of the political system is a theory.
- Theory should come first, that should be followed by research strategy. Karl Popper argues that theory provides the platform for scientific research.

**Answer to Q. 2:** The word 'science' is derived from a Latin word, 'scire' i.e. 'to know'. Any attempt to know through a methodology which is unassailable in approach and steps and the body of knowledge thus acquired is science. There are three general modes have served the purpose of acquiring knowledge, (i) authoritarian mode, (ii) mystic mode and (iii) rationalist mode. The last one leads us to reliable and testable knowledge. It is based on the philosophy that holds that the totality of knowledge can be obtained by strict adherence to the forms and rules of logic.

**Answer to Q. 3:** A research hypothesis is a prediction of the outcome of a study. The prediction may be based on an educated guess or a formal

theory. A hypothesis (H) is an unproven statement or proposition about a factor or phenomenon that is of interest to the researcher. It may be a tentative statement about the relationships discussed in the theory or analytical framework or represented in the analytic model. The hypothesis can also be stated as a possible answer to the research question. Hypotheses are statements about proposed relationships rather than merely questions to be answered. They reflect the researchers' expectation and can be tested empirically. Hypotheses also play the important role of suggesting variables to be included in the research design.

There are four common characteristics of hypotheses, which are as follows:

- Hypothesis must be clear and logically sound,
- It must be value free,
- Hypothesis should be specific, and
- It should be amenable to empirical testing.

**Answer to Q. 4:** Features of a good Hypothesis:

- A hypothesis must be conceptually clear. All the concepts used in a hypothesis must be clearly defined.
- A hypothesis must be empirically testable.
- A hypothesis must be specific and precise. The possible relationships among the variables must be precisely stated in a hypothesis.
- A hypothesis must be consistent with known facts.

**Answer to Q. 5:** Null Hypotheses basically means:

- Implicit complementary statement to the research hypothesis
- States no relationship/difference exists between variables
- Statistical test performed on the null
- Assumed to be true until support for the research hypothesis is demonstrated.

## 2.9 POSSIBLE QUESTIONS

**A. Short Questions** (Answer each question in about 50-150 words)

**Q 1:** What is science?

**Q 2:** What is scientific research?

**Q 3:** What is theory?

**Q 4:** How are theory and science interrelated? Explain it briefly.

**Q 5:** What is hypothesis?

**Q 6:** What are the significance of hypothesis in a research design? Explain briefly

**Q 7:** Identify the meaning of independent and dependent variables.

**B. Long Questions** (Answer each question in about 150-500 words)

**Q 1:** Write down the advantages and disadvantages of hypothesis.

**Q 2:** State the features of a good hypothesis.

**Q 3:** Discuss the various types of hypothesis with some examples.

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# UNIT 3: METHODS IN SOCIAL RESEARCH (I)

## UNIT STRUCTURE


3.1 Learning Objectives

3.2 Introduction

3.3 Historical Method

3.4 Comparative Method

3.5 Case Study Method

3.6 Content Analysis

3.7 Ethnographic Method

3.8 Let Us Sum Up

3.9 Further Reading

3.10 Answer to Check Your Progress

3.11 Model Questions


## 3.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- know about historical method, case study method, comparative method, content analysis, ethnographic method
- know the advantages and limitations of the different methods
- know utility of the different methods in terms of their applicability in different contexts.

## 3.2 INTRODUCTION

Research can be defined as the process of analyzing, investigating and an in-depth studying of subjects not only to add to the existing knowledge stock by discoveries and inventions, but also often to reinstate the existing knowledge base. The process of undertaking a research work entails a vast arena of specificities, like identifying the distinct research objectives, the scope of the work, and identification of appropriate research methods, amongst others, which further constitutes the Research Design. The choice of research methods for a particular study is an important part of the research

design. To undertake a research work, the researcher is equipped with different tools, techniques, and also a variety of research methods. Research method may be defined as a particular way of conducting a research. The methods of research may vary depending on the nature of the subject to be studied, the objective of the research work, etc. In this context, it is essential to understand the different research methods, their utility, etc. This unit throws light on four distinct research methods which are commonly used in Social research.



**CHECK YOUR PROGRESS**

**Q 1:** What is meant by the research design?

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**Q 2:** Mention a few research methods which are used in Social science research.

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## 3.3 HISTORICAL METHOD

The term historical method indicates that the studies based on this method focus on the chronology of events. In this method, emphasis is laid on the study of events/ entities of the past. This is done in order to acquire a holistic understanding of a given subject by analyzing the past trends. It is generally descriptive in nature.

A particular research method is chosen on the basis of the utility of the method in terms of achieving the desired research goals. The significance of the historical method lies in the fact that it enables the researcher to comprehend the past, which further enables one to understand the current situation and also to anticipate the future trends in some cases. It also brings to light the dynamic nature of an entity/ institution, etc.

The historical research method relies on various sources, both primary and secondary. Some of the prominent sources of the historical method are oral knowledge transmitted down through generations, accounts of events presented by live observers, documentaries, written records in the form of books, etc. The plethora of sources that facilitate historical research have both advantages and disadvantages. While on the one hand, they seem to be accessible and approachable, on the other hand they are subject to being manipulated/ presented in a biased manner. Thus it is important that such sources should be handled with utmost caution.

A research when undertaken subsumes in itself a comprehensive process. It unfolds in multiple steps. Some of the significant aspects of the historical research method are explained below. First, it must be taken note of that while selecting a particular research method, the validity and significance of that method must first be analyzed. Next, the formulation of the research problem is undertaken, along with the designing of the plan of the study. Further, the authenticity and the reliability of the available data sources must be confirmed. It is followed by the process of data collection from genuine sources. The collected data must be checked multiple times, if needed, in order to confirm its authenticity. Next, the collected data must be arranged in a systematic manner. This arrangement is an important aspect of research as it acts as the bedrock for further conduct of the research study. Eventually, the collected data must undergo a logical and scientific interpretation. It shall then enable the researcher to develop generalizations from the study and put forth relevant conclusions.

The Historical research method is subject to certain limitations. Some of the often faced problems while undertaking the historical research method are mentioned below:

- It is seen that adequate and reliable data may not be available sometimes, as this method focuses on the past events.
- Further, even if data is found, there remains a huge question on the reliability and genuineness of the data, especially in case of data obtained from oral knowledge systems, etc. This is so because in such

cases there is a tendency of the data being influenced by individual interpretations, hence leading to biasness.

- Also, in case of historical method of research, sometimes, it becomes difficult to trace or identify the accurate chronology of events in terms of their spatial and temporal location. An accurate timeline of the required data is essential because it enables one to analyze the subject in a precise manner, which shall further lead to the production of correct conclusions.
- Another limitation that a researcher may face while conducting a study based on the historical method is that of locating the required materials and data. This is so because materials are often widely scattered and dispersed over several locations.
- A significant aspect that associates with the limitations of the historical research method is that of the inability to verify, measure or replicate.



**CHECK YOUR PROGRESS**

**Q 3:** Fill up the blanks

(a) The historical research method is characterized by collection of data from both ….. and ….. sources.

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## 3.4 COMPARATIVE METHOD

The comparative research method is one of the prominent methods of social research. As the name suggests, the comparative method emphasizes on the comparison of two or more entities, with the objective of developing a holistic understanding of the entities. It must be noted that while there is no particular way or method of conducting research based on the comparative method, yet it is often seen that the quantitative techniques are used more than the qualitative ones in the comparative

method. Another important feature that is generally observed in case of comparative research method studies is that they generally do not engage with the analysis of grand theories. The comparative method is rather used in cases where middle range theories are subject to analysis which study parts or subsets of and entity and not the whole. The comparative method is generally applied to analyse aspects on two bases: spatial and temporal. For example, comparative method is often used to understand differences and similarities between different cultures/ groups, etc. A prominent technique used to undertake comparative analysis is the historical comparative research method. This technique is used to comprehend the subject of the study (say the society or any entity) in terms of its development and evolution in comparison to the past.

## 3.5 CASE STUDY METHOD

The case study method is a prominently used method of research. A case study can be defined as a holistic and in-depth study of an entity, a unit, person, event, etc. The case study research method enables the researcher to comprehend the subject in its entirety. The case study method is featured by its focus on bringing out the specificities and thereby developing a detailed understanding of the subject. It is perhaps this characteristic of the case study method that led Burgess to define the case study method as the 'social microscope'.

There are some common characteristics of the case study method. It facilitates the researcher to understand the uniqueness and particularities of the subject. This generally may not be possible in case of other research methods. While on the one hand, the case study research method enables the researcher to develop a general understanding of the subject, on the other hand, at the same time, it reflects the specificity of the subject. This further enables the researcher to carry out an intensive and detailed study. It is often seen that the utility of the case study method of research is compared to that of other methods, particularly the statistical method. It is seen that while the statistical method generally provides an overall view or

idea about the study, the case study method on the other hand provides the entire details of the subject. In the domain of social science research, the entity of the 'individual' holds a significant place. In case of the statistical research method, the 'individual' becomes obsolete. On the contrary, in the case study method, the idea of the 'individual' becomes significant because here the individual is considered as the whole and hence analyzed in its entirety. The case study method of research may employ several techniques while conducting a study. The techniques could be historical, descriptive, interview, etc, depending on the desired motive behind the study.

The case study method is also often analyzed in terms of the survey method of research. This is because the case study research is, often, also conducted as a supplementary method of study along with the survey method. In this context, the case study method can be further comprehended well by analyzing it in terms of the survey method. The case study, as mentioned above, caters to a detailed and intensive study, unlike the survey method which has a more broad based focus. This brings one to the aspect that while the survey method emphasizes on a plethora of units with the help of a selected sample, the case study method on the other hand emphasizes on a single unit. Further, while the findings of a study based on the survey method can be generalized, on the other hand, that of the case study method cannot be generalized. Again, the studies conducted on the basis of the survey method may be used to test hypothesis about large entities, social units, etc., those based on the case study method may be able to test hypothesis about specific entities.

The case study method is characterized by some advantages and disadvantages. The advantages are:

- The case method can easily adhere to any method of data collection.
- The case study method enables are to reach out and cover a whole range of aspects of the subject studied, thereby providing a holistic view of the subject under study.
- The case study method based studies do not require any particular social environment and can be conducted anywhere.

- Since the case study method focuses on the specificities of the subject, hence it provides the researcher the opportunity to test and analyze specific and individual aspects of a theory.

The disadvantages of the case study method:

- The foremost limitation that is often discussed in terms of the case study method is that of the inability of producing generalizations. Thus, despite providing an in-depth and holistic view of the subject studied, the studies based on the case study method cannot be used to make generalizations about larger units.
- The case study method based studies require plenty of time, unlike that of surveys.
- The inability of the case studies to generalize also further makes it inadequate for analyzing problems in the macro context.
- The studies based on the case study method are vulnerable to the researcher's biases as this research method allows the researcher to develop perceptions and understandings of their own. This may sometimes lead to the researcher's bias in the studies.



**CHECK YOUR PROGRESS**

**Q 4:** List one advantage and disadvantage of the Case Study Method.

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## 3.6 CONTENT ANALYSIS METHOD

Content Analysis is a significant method of collecting and analyzing data. In this research method, particular characteristics of the contents of different materials are identified which are used to draw logical inferences. Here, data is largely gathered from secondary sources like newspapers, letters, documented records, etc. It is important that the identification of

specific characteristics and the drawing of inferences must be an objective and a systematic process. The objectivity of the research can be tested by analyzing if the same data produces the same results for different researchers. Further, to ensure that the data is systematically organized it is important to assure that only the data that is relevant from the point of view of the research's objective must be analysed.

There is a general pattern of procedure that research undertaken through the content analysis method requires.

First, it is imperative to identify and define the content which shall be analysed, for example, the newspapers, documents, books, etc. It must be noted that if the content that is to be analysed is too large, then a sample of the content must be selected, which shall act as the representative unit of the entire content universe.

Next, the characteristics of the content must be identified and specified. Further, on the basis of these characteristics, the content is categorised.

Here it is important to understand a few concepts, i.e., recording units and context units. Recording unit can be defined as the smallest unit of content whereby the appearance of reference is seen. The context unit can be defined as a large element of the content that may be analysed while comprehending a recording unit. To illustrate further, a single term in a whole sentence can be identified as a recording unit, whereby the whole sentence shall be the context unit. There are five prominent recording units which are often used in the content analysis research method. They are items, paragraphs, themes, characters and words. Here, the 'word' is identified as the smallest unit. Theme, in this context, can be defined as a proposition. Character, in this context, can be defined as an individual entity in a literary piece of work. The term item, here, refers to an entire document, which may be in the form of a book, a talk series, etc.

The next step in content analysis research method is that of categorization. The systematic categorization of contents clearly highlights the objective of the study. Hence the categories must be logically and systematically designed so that they are coherent with the objectives of the

research. Also it must be noted that the criteria for categorizing the recording units must be specific and explicit. This is essential as it enables one to replicate the study, thereby ensuring the objectivity of it.

The final step in the content analysis research method is to arrange the collected data in a quantitative form. The quantification of the materials may be done in various ways like numbering the materials, ranking the materials, rating of the materials, etc.

It is often cautioned that the method of content analysis should not be used if there is any already available source of data collection like interview, etc. It is generally preferred that only in cases where there is no such direct source available that the content analysis method may be used. There are several applications of the content analysis method of research. Some of the uses of this method are to analyse the significance of the media communication system amongst the public, to understand current affairs with the help of newspapers, to comprehend important personalities and their philosophies, to understand folk way of life through folk literature, to get a picture of the past through classical texts, to understand the personalities, taste and way of conduct of people through their conversational analysis.



**CHECK YOUR PROGRESS**

**Q 5:** How is data collected under the content analysis research method? Explain in brief.

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## 3.7 ETHNOGRAPHIC METHOD

Ethnography is the main method of the qualitative study. It is purely based on qualitative data. It is the method where the observer becomes itself as a part of the situation or the community or culture. Actually

ethnography is a description and interpretation of a culture, social group and system. The researcher examines the group's observable and learned patters of behaviour, customs and ways of life. The process of data collection considers documentation, participant observation and interview.

Tape recorder, field notes, field diary etc. are some of the essential tools for carrying out this study. The method of Ethnography is utilized for study the functions of a system for drawing out empirically how the programmes or systems are actually functioning? In this method, through the way of participant observation and interview, a researcher can collect or observe the actual picture of the system by observing each and every aspects related to the system.

Ethnography is a branch of anthropology and the systematic study of individual cultures. Ethnography explores cultural phenomena from the point of view of the subject of the study. Ethnography is also a type of social research that involves examining the behaviour of the participants in a given social situation and understanding the group members' own interpretation of such behaviour.

As a form of inquiry, ethnography relies heavily on participant observation—on the researcher participating in the setting or with the people being studied, at least in some marginal role, and seeking to document, in detail, patterns of social interaction and the perspectives of participants, and to understand these in their local contexts. It had its origin in social and cultural anthropology in the early twentieth century, but spread to other social science disciplines, notably sociology, during the course of that century.

Ethnographers mainly use qualitative methods, though they may also employ quantitative data. The typical ethnography is a holistic study and so includes a brief history, and an analysis of the terrain, the climate, and the habitat. A wide range of groups and organisations have been studied by this method, including traditional communities, youth gangs, religious cults, and organisations of various kinds.

**Features of ethnographic research**

According to Dewan (2018), the researcher is not looking for

generalizing the findings; rather, they are considering it in reference to the context of the situation. In this regard, the best way to integrate ethnography in a quantitative research would be to use it to discover and uncover relationships and then use the resultant data to test and explain the empirical assumptions.

In ethnography, the researcher gathers what is available, what is normal, what it is that people do, what they say, and how they work.

Ethnography can also be used in other methodological frameworks, for instance, an action research program of study where one of the goals is to change and improve the situation.

**Date Collectoon Method:**

Multiple methods of data collection may be employed to facilitate a relationship that allows for a more personal and in-depth portrait of the informants and their community. These can include participant observation, field notes, interviews, and surveys.

Interviews are often taped and later transcribed, allowing the interview to proceed unimpaired of note-taking, but with all information available later for full analysis. Secondary research and document analysis are also used to provide insight into the research topic. In the past, kinship charts were commonly used to "discover logical patterns and social structure in non-Western societies".In the 21st century, anthropology focuses more on the study of people in urban settings and the use of kinship charts is seldom employed.

In order to make the data collection and interpretation transparent, researchers creating ethnographies often attempt to be "reflexive". Reflexivity refers to the researcher's aim "to explore the ways in which [the] researcher's involvement with a particular study influences, acts upon and informs such research". Despite these attempts of reflexivity, no researcher can be totally unbiased. This factor has provided a basis to criticize ethnography.



## 3.8 LET US SUM UP

- Research entails a wide and in-depth study of a chosen subject, which is undertaken in a systematic and planned manner.
- Historical research method is characterized by a study of the past. It is based on both primary and secondary sources of data.
- Case study method, as the name suggests, entails the study of a subject in a holistic manner by taking it as a case.
- In the Content Analysis method, the content of different materials is collected and analysed, which further serves as the data for the research work. The source of the content in this method is most often the secondary sources.
- The comparative research method consists of comparison of two or more entities.
- Ethnography is the main method of the qualitative study. It is purely based on qualitative data. It is the method where the observer becomes itself as a part of the situation or the community or culture. Actually ethnography is a description and interpretation of a culture, social group and system. The researcher examines the group's observable and learned patters of behaviour, customs and ways of life. The process of data collection considers documentation, participant observation and interview.



## 3.9 FURTHER READING

1) Bryman, Alan. (2012). Social research methods. USA: Oxford University Press.
2) Goode, William J. & Hatt, Paul K. (1952). Methods in social research. New York, USA: McGraw-Hill Book Co.



## 1.3 WHAT IS ENVIRONMENTAL ECONOMICS?

**Ans. to Q. No.1:** Research Design refers to the process of planning a research, which includes identifying the questions and objectives of

the research, selecting the research methods, the concept and scope of the study, etc.

**Ans. to Q. No. 2:** Historical method, Comparative method.

**Ans. to Q. No. 3:** Primary, Secondary

**Ans. to Q. No. 4:** Advantage: Research based on this method is easy to be conducted as it does not require any special condition or environment. Disadvantage: The case study method is very time consuming.

**Ans. to Q. No. 5:** Under the content analysis method of research, first the content must be identified which shall be studied. This should be followed by the characterization of the selected content. Then the selected content must be divided into categories and eventually it should be arranged in a definite quantitative form.



## 3.11 POSSIBLE QUESTIONS

**A. Answer in one or two words.**

**Q 1:** What is the commonly used source of data from which data is derived under the Content Analysis method?

**Q 2:** Which research method is primarily based on the analysis of events and entities of the past?

**B. Write short notes** (Answer within 150 words).

**Q 1:** Discuss the case study method of research.

**Q 2:** What are meant by the content analysis and comparative method of research?

**Q 3:** What are the significance of ethnographic method and content analysis method? Explain.

**C. Long type question** (Answer within 300-500 words).

**Q 1:** What is meant by research? What is the significance of research methods in any research study?

*** ***** ***

# UNIT 4: METHODS IN SOCIAL RESEARCH (II)

## UNIT STRUCTURE


4.1 Learning Objectives

4.2 Introduction

4.3 Survey Method

- 4.3.1 Stages of Social Survey
- 4.3.2 Advantages of Survey Method
- 4.3.3 Limitations of Survey Method
- 4.3.4 Types of Survey Method

4.4 Experimental Method

- 4.4.1 Types of Experiments
- 4.4.2 Merits of Experimental Method
- 4.4.3 Limitations of Experimental Method

4.5 Let Us Sum Up

4.6 Further Reading

4.7 Answer to Check Your Progress

4.8 Model Questions


## 4.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- Know the Survey method of Research along with its advantages, limitations and applications.
- Explain the Experimental Method as a method of Research along with its advantages, limitations and applications.

## 4.2 INTRODUCTION

Sociologists and educationists use different methods to study society, educational and social behavior. Out of the various methods survey and experimental method are two important method. In this chapter this two methods are discussed.

## 5.3 SURVEY METHOD

The survey method is used to collect data of existing phenomena and to justify current practices or conditions or to make plans for improving them. The term 'Survey' has come from two words, 'Sur' and 'Vor', which mean ''to see'' a particular thing from a high place. In Natural Sciences it is used for measuring the things and in Social Sciences, it indicates the investigation of social problems, the technique of collection of data through interview, questionnaire and books etc. Many philosophers and scholars have defined the term in different ways. According to P.V.Young, " Social surveys are concerned with (i) the formulation of a constructive programme of social reform and (ii) amelioration of current conditions of a social pathological nature, which have definite geographic limits and definite social implications and significance, (iii) these conditions can be measured and compared with situations which can be accepted as models". It is claimed that Young's definition of social survey is quite appropriate. Mark Abrams has defined social survey as a '' process by which quantitative facts are collected about the social aspect of a community's position and activities". Hence, from the above definitions it is clear that social survey in a broad sense provides the basis for theory construction, and the implications for social planning and reform.

The concept of social survey is not new. With a prolonged history, it iis both ancient and persistent. The history of social survey may be dated back to 447-425 B.C. when Herodotus wrote his own account on the effects of climates upon the traditions, religions, beliefs and behavior of people along with the effects of natural disasters and war upon the social relations and economy. A German Scholar Earnest Engel, an economist and statistician by profession, contributed a lot to social survey by formulating an original theory based on the study of family budgets. In the United States Sorokin, Zimmerman and Trompton have contributed immensely to survey. Whereas Zimmerman and Trompton have applied Leplay's techniques in their study of Ozark regions and some other communities, Lind's 'Middle Town', Lloyd Warner's 'Yankee City' and Ralph Linton's 'Plain Valley' are

categorized as geographical and cultural studies. Leplay's methods and techniques were also adopted by Charles Booth in England. By engaging the services of some young and energetic scholars like Beatrice Potter, Octavia Hill, Graham Balfour, Clara Collett, H. Llewellyn Smith and others, Booth conducted very remarkable surveys and presented a factual account of the matter. In all his works, Booth maintained objectivity and made empirical and scientific approach. Although H.C. Preston was inspired by Booth and made impressive studies of poor people, his book ''Bitter Cry of Outcast London''(1883) was more dramatic and emotional than realistic in character. A far more extensive study was made by B.S. Rowntree in the early 20th century.

Development of the survey movement in the United States may be dated back to 1890 with Jacob Ries' extensive work on the economic conditions of the slum dwellers in thickly populated towns. The year 1902 witnessed the publication of "Battle of the Slums". Thereafter "The Commission for Rented Houses" was established in New York at the behest of President Roosevelt, in in order to collect relevant data regarding the conditions of people living in rental accomodations. Lincoln Steffen's survey of economic and political condition of seven industrial town of the states in1904 gave impetus to social survey movement of that country. In 1917 Mary Richmond published her classic book "Social Diagonsis", based on her social case work. She also tried to evaluate the significance of representative character of sampling. However Pacel Kellog and his associates conducted the most scientific survey in the first decade of the 20th century. Theirs was the most well organized and systematic survey which attempted to understand the nature and effects of urbanization and modernization upon society. Between 1927 and 1931 the Regional Planning commission of New York conducted a survey of the problems and difficulties of the people in rented houses. Philip Klein and his associates organized an extensive survey of the social service in Pittsburg and also a study of related problem. Among the private individuals who conducted Social Surveys in the United States, the names of Ann W. Shyne , Otto Pollak and Donald Young deserve mention.

### 5.3.1 Stages of Social Survey Method

There are different stages for conducting a Social Survey. They are as follows:

- **Selection of Problem:** As social survey deals with social problems, selection of the problem is the first stage. Therefore unless and until the surveyors are not sure of the nature, character and clarity of the problem, they should not embark upon social survey. The social surveyor is not supposed to deal with every problem or any kind of problem. Rather as a careful observer the social surveyor must examine the clarity and definiteness of the problem he comes across in a community. Such a consideration must take into account the practical and utilitarian aspect which has its significance in the life of a community. Such a consideration must also take into account the practical and utilitarian aspect which has its significance in the life of a community.
- **Defining the purpose:** After the problem is chosen the surveyor attempts on defining the objective of the survey by making the purpose transparent so as to give direction to proceed, because in the absence of a crystal-clear definition of the aim the survey becomes directionless like a raddarless ship in the deep sea. The success of a survey and the capability of a surveyor is gauged only in relation to the attainment of goals. Hence when goals are not clearly defined the surveyor will grope in the dark. The goal may be generic or specific it may be for collection of census data or for knowing the living conditions of the working class specifically. In any case the goal must be well-defined.
- **Defining the Problem under investigation:** After having chosen the problem and having defined the goals, the surveyor endeavors to determine the scope, nature and character of the problem. For example, if the surveyor wishes to study the problem of drug addiction among the college youths he should

define what he means by the term ‘’drug addiction’”. He should also clarify different types of drugs causing addiction and the quantity of drugs taken per day indicating addiction.

- **Preparation of a schedule:** The constituent factors involved in the problem and its various elements need to be analysed so as to present a constructive programme. This necessitates the formulation of a detailed and systematic list in order to gather the relevant information around as well as directly on the subject of study.
- **Constitution of a commission:** All the official surveys are undertaken after constituting a commission headed by a director and some members who determine the policy and oversee its execution. The commission for survey is empowered to collect various types of data relevant to the study. It has to access to classified material considered appropriate for the purpose of survey. If the situation warrants the commission may be divided and sub-divided into various committees and sub-committees to deal with specialized matters.
- **Setting limits:** Determination of scope is the hall -mark of any scientific study. Understanding a problem necessitates systematic investigation into a limited and properly defined subject matter. Unless the scope is determined before the beginning of a survey, no phenomenan can be studied properly. Determination of scope takes into account the political and administrative division, different economic levels, biological bases, bases of social status, geographical base etc.
- **Setting time limit:** Not only cost estimate and trained investigators but also time estimate is essential for any successful survey. Whereas some problem need immediate solution , some others may require gradual transformation, some surveys are also required to be conducted within specific time intervals. The problems which are of topical importance undergo the process of gradual change. But some problems like

displacement of population, resettlement etc. need to be tackled immediately.

- **Decision about the means of information:** Depending on the type of survey, different techniques of collection of information are employed. The preliminary data collected through primary survey are mostly obtained through questionnaire, schedule and even through direct interviewing of informants. On the contrary secondary data are obtained through secondary survey on the basis of official and non-official reports and also through published and unpublished materials of primary survey.
- **Determination of the units of survey:** In order to make the field workers free from any kind of dilemma and to ensure smooth collection of data, the unit of survey should be defined in definite and unambiguous terms. The units should be stable, harmonized, simple and feasible.
- **Refinement of Data:** As far as practicable, it must be determined before undertaking the actual survey as to what extent the materials collected can be refined. If it is a qualitative survey, the determination of accuracy and refinement should be directly proportional to the availability of manpower, finance and time. However despite the availability of the maximum amount of funds, time and man power, it is never possible to obtain cent per cent accuracy in qualitative survey.
- **Selection and training of field workers and researchers:** While making selection of the primary investigators, the nature and scope of social survey should always be borne in mind. Intellectual acumen should not only be the basis of selection. Along with that the selecter should also lay emphasis on the personal qualities like pleasant personality, a good sense of humour, tactfulness, ability to establish rapport with the informants and the like. After their selection, they will have to be properly trained so as to deal with various types of information in the field.

- **Preparedness for Cooperation of the Informants:** Unless the cooperation of the informants is obtained, there will the problem of non-response as well as want of accurate information . Therefore prior to the survey being actually undertaken, it is essential to cause preparedness and responsiveness among the informants so as to obtain accurate information by the fieldworkers. The informants must be assured that the information given by them will be kept strictly confidential.
- **Choice of Survey technique:** Determination of survey technique must be made before starting it, depending upon the scope and the nature of the survey. In case questionnaire or schedules are chosen, this must be prepared beforehand to avoid delay in surveying.
- **Conduct of Field Work:** After completion of the requirements as shown above, the field workers should get ready to go to the informants for collection of data. At this stage care must be taken to contact the informants keeping in view their convenience. The field workers should be properly trained to establish rapport with the respondents as to elicit accurate information. Supervision is also required in the field work.
- **Organization, Classification and Statistical Analysis of Data:** The Data collected by the field workers under the supervision of the supervisors are then organized, classified and statistically analysed so as to be interpreted.
- **Drawing Conclusion:** Conclusions are drawn from the findings based on analysed data. It is always necessary take the help of competent and able researchers not only to draw conclusions, but also to elucidate the conclusions.
- **Graphical Representation:** The findings of a survey may be represented graphically so as to create lasting impression because of their attractiveness as well as ready intelligibility. Graphs have the capacity to bring to light the salient features of data at a glance without straining one's brain.

### 4.3.2 Advantages of Survey Method

In the survey method of data collection, the researcher and the people from whom the information is being collected generally have a face to face relationship and interaction. Researcher can explore answers from the respondents by probing. He/she can simultaneously observe behaviours of people while interviewing the questions or filling the questionnaires. When he/she forms a good rapport with respondent's real facts can be collected. These days with technological innovations surveys are conducted through emails or through phones; in such cases personal observation is not possible.

- When surveys are planned in a scientific manner by adopting scientific methodology such as selection of adequate sample, proper research design etc., can generate valid data which can be used to draw valid inferences.
- The survey method is appropriate when the base line data are required to be generated for all the people under study- such as population census. This will be useful in planning various programmes for the uplift of the people.
- Sometimes social researchers are criticized as subjective in their choice of method, coverage of persons and interpretation of data collected. However, when the surveys are planned in a scientific manner with proper survey design and questionnaire data is collected objectively with the help of well trained interviewers and appropriate statistical analysis has been conducted with the help of experts, the research is unlikely to be affected by researcher's individual perception or biases.
- Large scale surveys are useful in providing information about various problems, their causes and to formulate the required interventions.

Inferences drawn on the basis of properly designed and executed surveys are capable of generalization to the entire

population.

### 4.3.3 Limitations of Survey Method

- Survey research is generally costly and time consuming because data has to be collected from a large number of people.
- The researcher has to be well versed with statistical techniques, various research designs and their suitability to his research problem and other statistical method of data analysis.
- When the researcher has to conduct a survey on a large scale say for example at state or national level large number of investigators are needed. Investigators are to be trained properly and thoroughly before they are sent to the field.
- Basic integrity and objectivity is needed on the part of the researcher and his investigators
- Social surveys are useful in understanding only the present status of the problem.

### 4.3.4 Types of Survey Method

- Census survey and Sample survey: In census type of survey all the units of the research universe are contacted for collection of data. On the contrary in sample surveys some representative units are selected for collection of data. If the research universe is constituted by homogeneous units, sample survey is preferred because it spends less time, energy and money. But if the research universe is of heterogeneous nature, census survey is found to be more suitable.
- General and Specialized Surveys: In the general survey the entire community is studied in a general manner. On the other hand, a specialized survey attempts on unearthing some particular aspects of the community such as unemployment, child labor, problems of the slum, hygienic attitude etc.
- Direct and Indirect Survey: Quantitative description is possible

in direct surveys, such as the demographic surveys. On the other hand, the indirect surveys are not amenable to quantification. For example, surveys on level of nutrition or health condition are of indirect type. However both the types of social surveys have their own importance in the study of social problems.

- Widespread and Limited Survey: In a widespread survey a very large area is covered concerning multiple aspects of the purpose of social survey. But when a survey covers a small area and usually confines itself to specific questions, it is called a limited survey. Because of its concern with limited aspects, it maintains greater reliability than the widespread survey which deals with various aspects depending upon the survey purposes.
- Primary and Secondary Surveys: As the name suggests , the primary surveys are undertaken afresh and the field workers collect data directly from the field. In primary survey the surveyor has got the liberty to set goals for procuring the relevant facts. On the contrary, in the secondary surveys, the surveyor only examines the facts which are already available. It does not necessitate to collect afresh from the field by a fresh survey. If considered from the view point of reliability, primary surveys are always more reliable than the secondary types of surveys.
- Initial and Repetitive Survey: If a survey is conducted for the first time in an area it is called an initial survey. Any subsequent surveys on the same problem covering the same area are called the repetitive surveys.
- Official, Semi-Official and Private Surveys: Any survey conducted by the governmental organization is called an official survey. But when any quasi-governmental institutions like boards, corporations, universities etc. conduct any survey it is called semi-official type of survey. In the similar manner, surveys conducted by private individuals, organizations or agencies are called the private surveys.

- Regular and Ad-hoc Surveys: As is clear from their names, the regular surveys are conducted at regular intervals without any discontinuity. In India the SBI conducts such surveys. On the other hand the Ad-hoc surveys are not undertaken periodically. Rather these are conducted with some specific purpose with regularity.
- Public and Confidential Surveys: The data of some surveys are of general type and no secrecy is maintained in collecting data or publishing the findings . Such surveys are therefore, called the public surveys. On the contrary in some surveys the data required are of highly personal in nature requiring confidentiality. No information is revealed to the public. Such surveys are called confidential surveys.
- Postal and Personal Surveys: If the data is collected by mailed questionnaire, it is called postal survey. On the other hand, the data collected through direct interview of the informants come under personal survey.

Notwithstanding the typology of surveys, in general terms it may be ascertained that on the basis of a social survey practical steps may be taken to mitigate or bring an end to problems confronting a society or community and also social survey has become a part and parcel of many other social sciences.



**CHECK YOUR PROGRESS**

**Q 1:** What is the etymological meaning of the word Survey?

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**Q 2:** How did Earnest Engel contribute to Social Survey?

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**Q 3:** Mention one limitation of Social Survey.

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**Q 4:** Differentiate between Census survey and Sample survey.

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**Q 5:** What do you mean by primary and secondary survey?

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## 4.4 EXPERIMENTAL METHOD

Experiment has been regarded as the sole basis of scientific method for fairly long time and it was on this basis that social sciences were denied the place of science. The use of this method has primarily been made in the physical sciences where the subject-matter can be given the laboratory treatment under controlled conditions. But this method which for a fairly long time remained the exclusive domain of the physical scientists is gradually finding favour with social sciences as well. Experiments now play an important part in researches in Psychology, Sociology and Anthropology, although social experiments are slightly different from the physical experiments as accounts of the limitations placed upon them by the nature of the subject matter with which the social sciences have to deal.

A social experiment has been variously defined by the writers. Jahoda and others, regard social experiment as a method of testing hypothesis. Greenwood suggests that, an experiment is the proof of a hypothesis which seeks to hook up two factors into a causal relationship through the study of contrasting situations which have been controlled on all factors except the one of interest the latter being either the hypothetical case or the hypothetical effect".

According to Festinger," the essence of an experiment may be described as observing the effect on a dependent variable by manipulation of independent variables."

The basic factor in case of experimental method is, thus the control over the subject of study and manipulation of an independent variable to study its effect upon the dependent variables. The control and manipulation of independent variable although fundamental to experimental method is nevertheless a rather loose term. It is not so much the control as such but the degree of control that one can exercise. It is because of this difference in the degree of control that there is wide variety of opinion regarding the social experiments.

### 4.4.1 Types of Experiments

Social experiments may be divided into various classes according to the type of setting, nature and extent of control and the technique adopted for manipulating the variables. Greenwood has mentioned following five types of experiments.

- Trial and Error Experiment: This may be called as the earliest form of experiment. Under this method the researcher does not prepare a structured plan of study. He prepares a hypothesis and tries to test it on actual social conditions, wherever, they may be found. As the study is not rigidly planned his technique will undergo a constant modification in the light of experience. For example he may start his studies on a small group but later on finding that it was unsuitable may enlarge it or change it altogether.This type of experiment may hardly be called scientific and usually entails much fruitless labor and waste of time.
- Natural Experiment: It is also known as field experiment. This name has been given to this method because the experiment is conducted in the natural setting. It is different from the from the field study or field observation because in case of field experiment we try to manipulate the independent variable while in case of field study we simply observe the phenomena taking place without any kind of manipulation.

  Natural experiment has been used for studying a wide variety

of techniques and methods such as advertising technique, training methods, effect of group decision and group participation, effectiveness of political propaganda and the like. As an illustration we can cite the experiment carried on by Coch and French regarding the effect of participation by the employees in planning upon their resistance towards it. The hypothesis in this case was that greater the participation on the part of employees in planning to meet the changed condition, the less would be their resistance to the change. The experiment was conducted in a mill. Certain changes were introduced in the working of the factory. In the cases of control group no participation of labor was allowed. The new changes were simply explained to the workers by the production manager. In case of the second group the representative of the workers were allowed to discuss things. In the third group total participation was allowed. In this way it was possible to study the effect of different type of participation and also varying degree of participation upon the resistance of the workers towards change. The hypothesis in this case was found to be correct as it was proved that in all cases where the workers were allowed to participate in deciding the change the resistance was almost negotiable.

- Ex-post-facto Technique: This technique is generally used to study the varying influence of two identical factors. Thus for example, suppose it is proposed to study the influence of Hindi and English education upon future adjustability in life, we shall take an equal number of students in each group keeping in mind that other variables like age, economic status, intelligence etc. should be matched in both cases. After, say, ten years we shall again try to locate those persons and see how they are placed in life. The difference between the two may be attributed to the nature of education received.
- Laboratory Experiment: A laboratory experiment has been defined by Festinger' as one in which the investigator creates a

situation with the exact conditions he wants to have and in which he controls some and manipulates other variables. The major difference between field experiment and laboratory experiment is that in field experiment the nature of experiment is studied in the natural setting with degree of control. A field experiment is studied in the natural setting with control over independent variables, but for a laboratory experiment the setting is artificially created. Thus, for example, if we make an experiment with the school boys in the school itself it would be field experiment, but if we create a small classroom and experiment upon it, it will be laboratory experiment. In a laboratory experiment the phenomenan is artificially created and is naturally subject to greater control and manipulation.

### 4.4.2 Merits of Experimental Method

The experimental method has following advantages over other methods of study:

- It permits the determination of cause and effect relationship more clearly than other methods. In case of other methods we can at best locate the degree of association or covariance but we cannot say with certainty as to which is the cause and which is the effect. For example, we can say that higher wages and higher output go together, but we cannot say whether higher wages have caused higher output or vice versa. Unless the cause and effect are clearly located it is not possible to control the phenomena which is the primary practical objective of any research.
- It is more precise and accurate. Since the variable under study is manipulated leaving others uncharged we can locate with precision the effect of varying degree of stimulas. For example, we can find out precisely the effect of varying degree of freedom of work upon output. This will helps us to fix up the optimum

points or norms. In the above example initial increase in the degree of freedom may lead to rise in the output but after a certain limit it may result in the reduction. A complete freedom of work may result in the fall in production rather than a rise in it. By knowing the effect of the varying degree of freedom we can fix up norm of the degree of freedom when production is highest.

- It is the best method for testing a hypothesis. Casual observation may help in the formulation of a hypothesis but it is only through experimental method that it can be tested and verified. Testing of a hypothesis requires a study of relationship under varied conditions which is possible only under experimental method. The precision and rigorousness of this method makes it more suitable for this purpose.
- Experimental method has been universally acclaimed as the most scientific method. Its use in social sciences has been limited only because of the difficulties presented by social phenomena and our lack of knowledge of it rather than due to any defect in the system itself. As our knowledge of the social phenomena increases we shall be in a position to make increasing use of experimental method.

### 4.4.3 Limitations of experimental method

Though the experimental method has many advantages, but still now the use of this method in the social sciences has not been very frequent. This is because of the various difficulties that the experimenter has to face in conducting an experiment. Some of these difficulties are as follows:

- Difficulties of Setting: The first major difficulty in case of a social experiment is finding out proper setting. In case of a laboratory experiment the setting has to be created and it is not always possible. For example: we cannot compel a person to resign to study the effect of his unemployment upon his family. There a

lots of social phenomena which cannot be enacted in the laboratory under created conditions. Even when the experiment has to be conducted in the natural setting there is the problem of finding out the place where the phenomena is found in sufficiently pure form to follow observation. For the study of the effect of strike upon composition of trade union leadership there must first of all be a strike. Even when we have located a place it is not always possible that the owners of the setting may allow the experiment to be conducted upon it.

- Difficulties of Co-operation: A physical scientist has to deal inanimate things which do not grudge any manipulation upon them. One can pick up a piece of iron and heat it as one like to observe the effect of heat upon iron. Human beings who form the subject -matter of social experiment are not so easy to be manipulated. They work according to their free will and their willing co-operation with the experiment is necessary.
- Difficulty of Control: For successful experiment it is necessary that all other causative factors except the one under study must be strictly unchanged and the particular variable may be variated gradually. This is extremely difficult. The difficulty is mainly created by complexity of social phenomena, its dynamic nature and independence of human behavior.But whatever may be the difficulty in experimental method, that this method is an important method of Social Research it can't be denied.

In the words of Lewin, " Although it appears to be possible to study certain problems of society in experimentally created smaller laboratory groups, we shall have also to develop research technique that will permit us to do real experiments in existing 'Natural' social groups."



**CHECK YOUR PROGRESS**

**Q 6:** Define social experiment.

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**Q 7:** How many types of experiments are there?

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**Q 8:** What is Controlled Observational Study?

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**Q 9:** Mention one merit of Experimental Method.

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**Q 10:** What is the first major difficulty in case of a social experiment?

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.....



## 4.5 LET US SUM UP

- The term 'Survey' has come from two words, 'Sur' and 'Vor', which mean 'to see' a particular thing from a high place.
- In Natural Sciences it is used for measuring the things and in Social Sciences, it indicates the investigation of social problems.
- In the survey method, for data collection, the researcher and the people from whom the information is being collected generally have a face to face relationship and interaction.
- Researcher can explore answers from the respondents by through probing.
- Experiment has been regarded as the sole basis of scientific method

for fairly long time and it was on this basis that social sciences were denied the place of science.

- The use of this method had primarily been made in the physical sciences where the subject-matter can be given the laboratory treatment under controlled conditions.



## 4.6 FURTHER READING

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2) Kirk, R. E. 1995. Experimental design: Procedures for the behavioral sciences. Pacific Grove, CA: Brooks/Cole.
3) Moser, C.A. 1958. Survey Methods in Social Investigation. New York: The MacMillan.
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## 4.7 ANSWERS TO CHECK YOUR PROGRESS

**Ans. to Q. No.1:** The ethymological meaning of the word survey is to see a particular thing from a high place.

**Ans. to Q. No. 2:** Earnest Engel contributed to social survey by formulating an original theory based on the study of family budgets.

**Ans. to Q. No. 3:** Social Survey is generally costly and time consuming because data has to be collected from a large number of people.

**Ans. to Q. No. 4:** In Census type of survey all the units of the research universe are contacted for collection of data but in sample survey some representative units are selected for collection of data.

**Ans. to Q. No. 5:** By primary survey is meant those surveys which are undertaken afresh and field workers collect data directly from the field. On the other hand by secondary survey is meant those surveys where the surveyor only examines the facts which are already available.

**Ans. to Q. No. 6:** In the words of Festinger," the essence of an experiment may be described as observing the effect on a depend variables of the manipulation of an independent variables"

**Ans. to Q. No. 7:** There are five types of experiments.

**Ans. to Q. No. 8:** Controlled observational study are those study which includes observation of the phenomena under controlled conditions. Under this method a stimulus is provided to the subject and changes are observed to find out the causal effect of the stimulus.

**Ans. to Q. No. 9:** One merit of experimental method is that it permits the determination of cause and effect relationship more clearly than other methods.

**Ans. to Q. No. 10:** The first major difficulty in case of a social experiment is finding out a proper setting.

## 4.8 POSSIBLE QUESTIONS

**A. Short Questions** (Answer each question in around 150 words).

**Q 1:** Trace the history behind the development of social survey.

**Q 2:** Discuss any three types of survey with appropriate examples.

**Q 3:** Write about the limitations of Social Survey as a method of Social Research.

**Q 4:** What is social experiment and discuss any two types of experiment.

**Q 5:** Write about the merits of Social Experiment as method of Social Research.

**B. Long Questions.** (Answer each question in around 300-500 words)

**Q 1:** Describe in detail the different stages for carrying out Social Survey.

**Q 2:** Critically discuss about the experimental method as as method of social research.

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# UNIT 5: TOOLS OF EDUCATIONAL RESEARCH

## UNIT STRUCTURE


5.1 Learning objectives

5.2 Introduction

5.3 Sources of Data Collection

- 5.3.1 Observation Method
- 5.3.2 Interview Method

5.4 Questionnaire

- 5.4.1 Preparation of a questionnaire
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## 5.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- identify the meaning of primary and secondary data
- describe the different methods of data collection like interview, observation
- explain sampling as a technique that simplifies data collection
- discuss the meaning, features, advantages and disadvantages of a questionnaire and also the preparation of a questionnaire.
- know the meaning of scale, scaling and types of scaling
- know the importance of scaling and difficulties of using scaling teaching in sociological research.

## 5.2 INTRODUCTION

Data collection can be considered the heart of research because data is the main core of any research. Without proper and adequate data we cannot derive any acceptable and satisfactory findings. Data collection is, therefore, one of the most vital aspects of research. Once the topic for research or the research problem is selected, the researcher needs to decide on the methods he/she would use to collect data. The methods that the researcher would use must complement the research design and only then can he/she arrive at a valid conclusion. Thus, a lot of effort, caution and hard work are necessary on the part of the researcher while deciding on the methods of data collection and collecting data. In the previous unit we have discusses the fundamental concepts or research and the different types of research. In this unit we would discuss the meaning and concept of two types or sources of data i.e. Primary data and Secondary data. After having an understanding about them, we would learn the different methods of collecting primary or secondary data like Observation, Interview etc... Further we would also try to understand the meaning of scale, scaling and types of scaling.

## 5.3 SOURCES OF DATA COLLECTION

Data collection as mentioned before is a very important component of research. There can be no research without data. Thus, immediately after identifying the topic of research, the researcher has to decide on the method and technique of data collection. There are two sources of data- Primary and Secondary.

**PRIMARY DATA:** Primary data are those data which are collected for the first time and are original in nature. These are first hand data. The researcher should be the first one to collect these data. We can collect it through experiments by conducting experimental research or through surveys, or with the help of observation and interviews. Thus it means that there are several methods of collecting primary data. The most important

methodsof gathering primary data are: Interview method, Observation, Focus group discussion, etc.

**SECONDARY DATA:** Secondary data means the data that are already available i.e. they refer to the data which have already been collected and analysed by someone else. The researcher himself /herself does not collect the data but uses or refers to the data collected by others. Secondary data may be published or unpublished data. Usually published data are available in various publications of the central, state or local governments; various publications of foreign governments or of international bodies and their subsidiary organisations; technical and trade journals; books, magazines and newspapers; reports prepared by research scholars, universities; public records and statistics, historical documents and other sources of published information. The sources of unpublished data are diaries, letters, unpublished biographies and autobiographies etc.

**SOURCES OF PRIMARY DATA:**

### 5.3.1 Observation

It is an important technique of collecting primary data. It implies the researcher being present in the field and observing the activities and events in the field. Observation can be both participant as well as non participant. It is a basic method of obtaining information about the world around us. However, all observation is not scientific observation. It becomes a scientific tool for the researcher to the extent that it serves a formulated research purpose and it is planned systematically

- **Participant Observation:** Here the researcher tries to make himself/herself a member of the group he or she is studying. The researcher participates in the events and activities in the field and makes an attempt to get the insiders perspective. He/ She also builds up close relationship with the members of the group and tries to experience any occurrence or event like the other members. Since the researcher stays in the field to be a

part of the everyday life activities of the group members, so this type of research is called Participant observation.

- **Merits of Participant Observation:**
  - The researcher can conveniently witness, understand and the natural behaviour of the group.
  - Participant observation enables one to get the insider's perspective. The study can be very in-depth in this process.
  - The researcher can gather much more information which would not have been possible otherwise.
  - Since the researcher comes in close contact with the respondents, he/she may be able to gain their faith and trust and thereby get their views, ideas or perceptions even on sensitive or difficult issues.
- **Limitations of Participant Observation:**
  - This method demands from an observer a high level of empathy. The observer is required to recreate in his/her imagination, the thought and feelings which are in the minds of his subjects
  - This type of research involves a lot of time.
  - It is not very conducive for all situations. For example, if someone is conducting research on a terrorist organisation then it may not be possible for him/her to have participant observation or it will be difficult and unsafe.
  - The observer may sometime become one with the group and lose his/her objectivity. As a consequence, he/she may ignore several occurrences in the group and not record them at all thinking that they are just commonplace and natural
- **Non Participant Observation:** Here the researcher is not an active participant. In non-participant observation it is not necessary for the researcher to make himself/herself a member of the group under the study. He/She must be present in the field, but need not take part in the group actions and activities. The researcher observes the events in a detached manner

without any active participation init. The researcher would observe and analyse the events or activities as an outsider or non-member of the group. The advantage of this type of observation is that there is less chance of biasness or loss of objectivity on the part of the researcher.

### 5.3.2 Interview

It is probably the most common technique of primary data collection. It implies oral questioning and response or verbal communication. Here the researcher goes to the field and verbally converse with the respondents and gets their views and opinions on the different issues related to his/her topic of study. It can be considered as 'meeting' in which the interviewer puts questions to the interviewer and records his responses. This meeting is always face-to-face where both the parties communicate with each other not only through gestures, mannerisms, facial expression etc. Interview is one of the most effective and extensively used tools of data collection. There are different types of interviews:

- **Unstructured Interviews:** Unstructured interviews are those where issues are raised in a conversational form. The questions are not predetermined or pre-set. The researcher communicates with the respondents keeping in mind the broad framework of the research and tries to gather as much information as possible. The questions are open ended, flexible, and allow the respondent to give his/her opinion, put forward his/her views and arguments in detail. Since the interview is in a conversational form, questions are put in a way that helps in maintaining the flow of the interview. These interviews are most often in-depth and are effective in the context of sensitive issues. Usually qualitative data are collected through this method. This type of interviews are generally used in exploratory studies or in studies pertaining to sensitive subjects.

- **Semi Structured Interview:** In this type of interview ask a number of specific major questions but he is also free to probe beyond the answers to these questions. Interview guides are used in this type of interview so that it allows comparison between the data or information gathered from different interviews. The questions here are both close and open ended. The interview guides help in putting the questions in a proper sequence so that the flow of the interview is well maintained and the questions remain within the broad ambit of the research topic. This type of interview generates both quantitative and qualitative data.
- **Structured Interview:** Structured questionnaires are used in this type of interview. The questions are predetermined and put in a definite sequence to seek opinions and perceptions on the issues pertaining to the topic of study. The questionnaires usually contain number of short questions, the answers of which are coded numerically. All interviews are conducted in the same way to generate reliability using set questions and set response codes. Structured interviews generate a lot of information but they lack in depth. Both quantitative and qualitative data can be gathered with the help of structured interviews.



**CHECK YOUR PROGRESS**

**Q 1:** What is meant by Participant Observation?

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**Q 2:** What is meant by Unstructured Interview?

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**Q 3:** Is non-participant observation a source of secondary data?

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## 5.4 QUESTIONNAIRE

There are various tools available for conducting personal interview. Questionnaire is one such research tool used to collect primary data from the interviewee. A questionnaire consists of a number of questions printed or typed in a definite order or on a form or set of forms. The questionnaire is given to the respondents who are expected to read and understand the questions and write down the reply in the space meant for the questionnaire itself. The respondents have to answer the questions on their own.

### 5.4.1 Preparation of a Questionnaire

There are certain steps and procedures that one needs to follow while preparing a meaningful questionnaire. Some of the important aspects are discussed below.

- **General Form:** Questionnaires are generally structured in which there are definite, concrete and predetermined questions. Each interviewee is asked the same questions. The questions are therefore presented with exactly the same wording and in the same order to all the respondents.
- **Question Sequence:** The researcher must be very careful about the question sequence while preparing a questionnaire. The questionnaire would be meaningful and effective only when the questions are put in a definite order or sequence. The questions must follow a specific pattern; each question following from the above. The questions must be easy; its meaning clear and there should be a flow from one question to the other so that it helps the researcher to easily understand and give his/her views/ answers. The initial or the first few questions should be the easiest to answer and should be able to arouse the interest of the respondents.
- **Question formulation and wording:** The questions put in the questionnaire should be simple and written in a lucid language.

The questions should not lead to any misunderstanding and miscommunication. The questions should be such that they areunderstood easily. Further, it should convey only one thought at a time.

### 5.4.2 Fuatures of a Good Questionnaire

- Questionnaire should be comparatively short and simple
- Questions should proceed in logical sequence moving from easy to more difficult questions
- Personal and intimate questions should be asked towards the end.
- One must try to avoid technical or difficult terms and vague language which may be misunderstood or misinterpreted.
- The researcher must avoid questions which affect or hurt the sentiments of the respondents.
- There should be sufficient space for the respondent to answer the question especially the open ended ones.

### 5.4.3 Merits of a questionnaire

- It is cost effective, especially in the case of a large population. It saves money that one would have to incur if he/she has to visit and attend to each respondent.
- It can save time of the researcher. Rather than personally meeting and interviewing every respondent in case of a large population, the researcher can simply send the questionnaires to many at the same time and get their responses within a short duration.
- Here there is less chance of the interviewer's biasness or manipulation. Since he/she is not present, the respondent can write the replies on his/her own without being influenced by the researcher or interviewer.

- The respondents get enough time and space to provide their views and opinions.
- Large samples can be made use of and thus the results can be made more dependable and reliable.

### 5.4.4 Demerits of a questionnaire

- Questionnaires are useful only in the case of educated and cooperative respondents.
- Sometimes the respondents may misunderstand the questions and hence the researcher may fail to obtain the desired result.
- There is a possibility of ambiguous replies or omission of replies altogether to certain questions; interpretation of omissions is difficult
- At times it becomes difficult to receive the questionnaires back from the respondents and then it delays the whole process.



**CHECK YOUR PROGRESS**

**Q 4:** Why is there less expenditure in using questionnaires in research?

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**Q 5:** Why is questionnaire usually considered a slow method?

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## 5.5 MEANING OF SCALE AND SCALING

Scaling is the branch of measurement that involves the construction of an instrument that associates qualitative constructs with quantitative metric unit. Scaling evolved out of efforts in psychology and education to measure "immeasurable" construct like authoritarianism and self-esteem.

Scaling describes the procedures of assigning numbers to various degrees of opinion, attitude and other concepts. The process of measuring abstract concepts in concrete terms remains one of the most difficult tasks in empirical social science research. Scaling is a branch of measurement that involves the construction of measures by associating qualitative judgments about unobservable constructs with quantitative, measurable metric units. Stevens (1946) said, "Scaling is the assignment of objects to numbers according to a rule." In many ways, scaling remains one of the most arcane and misunderstood aspects of social research measurement, and it attempts to do one of the most difficult of research tasks- measure abstract concepts. The problem to which techniques are applied is that of ordering a series of items along some sort of continuum. In other words, they are methods of turning a series of qualitative facts into a quantitative series.

Originally the word 'scale' comes from the Latin word 'scala', meaning a ladder or flight of steps. A scale represents a series of ordered steps at fixed intervals used as a standard of measurement. Scales are used to rank people's judgments of objects, events, or other people from low to high or from poor to good. Scales can be unidimensional or multidimensional, based on whether the underlying construct is unidimensional (e.g., weight, wind speed, firm size) or multidimensional (e.g., academic aptitude, intelligence).The three most popular unidimensional scaling methods are: (1) Thurston's equal-appearing scaling, (2) Likert's summative scaling, and (3) Guttman's cumulative scaling. A scale is a continuum from the highest to the lowest points, and has intermediate points in between these two extremes. The scale point is higherthan the third point and so on. A scale is a method of measurement. In social research; attitude, behaviour, and other qualitative characteristic are measured by means of different scales. The scalability of the phenomena depends on its continuum. The various factors of the phenomena must be logically interrelated and should be capable of continued measurement. A scale must be reliable.

Scaling is the method of turning a series of qualitative facts (referred to as attributes) into a quantitative series (referred to as variable). The complexity of this undertaking, and hence it may have pitfalls, can best be

seen by considering what is meant by ordering items along a continuum. For example, when one wishes to measure the size of a series of families, no problem arises. Families sare counted as having certain number of members; all families which have seven members also have at least six; all those with three also have at least two, and so on. This is obvious and in the nature of the ordinal character of measurement. It is clear that no man can save his second thousand dollars until the first is accumulated. This is because the amount of money in the bank has a quantitative character. Construction of scale and its application requires a high degree of consciousness of the logical problems surrounding the twin assumptions of (i) the existence of a continuum and (ii) the representativeness of that continuum achieved by the particular scale in mind. The question of representativeness is checked by tests of validity.

## 5.6 TYPES OF SCALES

Basically there are four types of scales found. They are discussed below:

- **Nominal scale:** Nominal scales, also called categorical scales, measure categorical data. These scales are used for variables or indicators that have mutually exclusive attributes. For examples gender (two values: male or female), industry type (manufacturing, financial, agriculture, etc.), and religious affiliation (Christian, Muslim, Jew, etc.). Nominal scale is simply a system of assigning umber symbols to events in order to label them. Nominal scale provides convenient ways of keeping track of people, objects and events.

  One cannot do much with the numbers involved. Nominal scales merely offer names or labels for different attribute values. The appropriate measure of central tendency of a nominal scale is mode, and neither the mean nor the median can be defined. Nominal terms have no corresponding reality, either in or outside our mind. These are mere words. Nominal scales are only in name. Numbers are assigned to them like labels. These provide identity. The identifying numbers can

be switched around. They can be interchanged. This scale consists of two or more named categories into which individuals, objects or responses are classified.In a nominal scale, it is possible to distinguish two or more categories in relation to the specified attribute. Nominal data are marked by their equality. These cannot be placed in a meaningful order, or ranked as higher or lower with regard to each other, except according to some other yardstick. Nominal scale is the least powerful level of measurement. It indicates no order or distance relationship and has no arithmetic origin. It simply describe differences between things by assigning them to categories, for that reason nominal data is counted data. It is a simple method of classification rather than an arrangement along a continuum. The question of dimension is not important in this type of scale. If desired, the different groups may be numbered. Classification of individuals according to religion is an example of nominal scale. The categories of nominal scale must be related to each other. They must lie along the same dimension like landownership, gender, voting behaviour etc.

- **Ordinal Scale:** Ordinal scale is the lowest level of the ordered scale that is commonly used. Ordinal scale places events in order, but there is no attempt to make the intervals of the scale equal in terms of some rule. Ordinal scales generally measures non-numeric concepts like happiness, satisfaction, discomfort etc. Ordinal scales are those that measure rank-order data, such as the ranking of students in a class as first, second, third, and so forth, based on their grade point average or test scores. However, the actual or relative values of attributes or difference in attribute values cannot be assessed. Ordinal scale is easy to remember because it is hearing like order and that's the key to remember with ordinal scales- it isthe order that matters. In addition to the qualities possessed by nominal scales, ordinal scales show transitivity. They possess asymmetrical order or succession. The use of an ordinal scale implies a statement of 'greater than' or 'less than' without our being able to state how much greater or less. The real difference between rank 1 and 2 may be more or less than the difference

between rank 5 and 6. The central tendency measure of an ordinal scale can be its median or mode, and means are uninterruptable. Hence, statistical analyses may involve percentiles and non-parametric analysis, but more sophisticated techniques such as correlation, regression, and analysis of variance, are not appropriate. But, as like the nominal scale, ordinal scale does not measure the distance between the positions.

- **Interval Scale:** In this type of scale the distance between two items is known. In interval scale the intervals are adjusted in terms of some rule that have been established as a basis for making the units equal. The units are equal only in so far as one accepts the assumptions on which the rule is based. The exact differences between two values are known in this scale. This scale has equal units of measurement. For that, it is possible to interpret not only the order of scale scores but also the distance between them.Interval scalesare those where the values measured are not only rank-ordered, but are also equidistant from adjacent attributes. For example, the temperature scale (in Fahrenheit or Celsius), where the difference between 30 and 40 degree Fahrenheit is the same as that between 80 and 90 degree Fahrenheit.. The intelligence quotient (IQ) scale is also an interval scale, because the scale is designed such that the difference between IQ scores 100 and 110 is supposed to be the same as between 110 and 120 (although we do not really know whether that is truly the case).Interval scale allows us to examine "how much more" is one attribute when compared to another, which is not possible with nominal or ordinal scales. Allowed central tendency measures include mean, median, or mode, as are measures of dispersion, such as range and standard deviation. Interval scale provides more powerful measurement than ordinal scales because interval scale also incorporates the concept of equality of interval.
- **Ratio Scale:** This scale incorporates the properties of an interval scale together with a fixed origin or zero point. Weight, length, and time are obvious examples. A ratio scale possesses a meaningful zero point. The zero point is not as precise as it was once believed to be. We can conceive of an absolute zero of length and similarly we can conceive of

an absolute zero of time. This type of scale represents the actual amount of variables. Measures of physical dimensions such as weight, height, distance, etc. are examples. Researchers in physical science have the advantage to describing variables in ratio scale form but the behavioural sciences are generally limited to describe variables in interval scale form, a less precise type of measurement. This point exists at that point where the scale possesses no quality either this way or that. It is the top level of measurement and is not often available in social research. The factor which clearly defines a ratio scale is that it has a true zero point. A rational zero is a location on an interval scale deliberately chosen for reasons other than the current data. The distinctive feature of a ratio scale is that it has an origin defined by a dominating theory. These use of a ratio scale permits comparisons such as being twice as high, or one-half as much. Reaction time uses a ratio scale of measurement-time. On the basis of a ratio scale one can compare both differences in scores and the relative magnitude of scores. Ratio scales provide a wealth of possibilities when it comes to statistical analysis. These variables can be meaningfully added, subtracted, multiplied, and divided.

- **Attitude Scale:** An attitude scale is a special type of questionnaire designed to produce scores indicating the intensity and direction of a person's feeling about an object or event. In this type of scale, the attitude of an individual towards a matter, thing, object or system can be known from the score of his responses given on a questionnaire. The score will place him on a scale. He simply expresses his like or dislike, agreement or disagreement with the issue involved, as given in the forms of questions. On the basis of his reply, he is assigned a score which indicates his position. Some relevant and indirect statements can also be used to reveal the attitude. In the attitude scale, most of the scales used are ordinal in nature, though there is attempt to treat the resulting data as internally scaled. This type of scales provides a quantitative measurement of attitudes, opinions or values by summarizing numerical scores given by researchers to people's responses to sets of statements exploring dimensions of an underlying

theme.

There are various types of attitude scales. These are discussed below-

- **Point Scale:** In this scale, at first, a crucial number of words of which the opinion are required is selected. The word may be prayer, dancing, birth control, smoking and so on. The respondent is to cross out every word that is more annoying than pleasing to him. One point is given to each agreement or disagreement, whichever is to be chosen. There is another variety of point scale. In such a scale two sets of words indicating both favourable and unfavourable opinions are given. The unfavourable items may be crossed or favourable item may be left uncrossed.
- **Thurstone Scale:** Louis Thurstone, one of the earliest and most famous scaling theorists, published a method of equal-appearing intervals in 1925. It is the most widely used method of scaling. Its procedure is used to develop scale items to measure attitudes. It is also known as equal-appearing scale, and judgment scale. It is a uni-dimensional scale, for it measures aggregate attitude towards a specific issue. A Thurston scale is an attitude scale consisting of items with which the respondent has either to agree or disagree. Only those items with which the respondent agrees are second. Each item has a value and the respondent's score on the scale corresponds to the median score of the items with which the respondent agree. In this scale a number of statements, whose position on the scale has been determined by judges, is used. The position is determined by the method of equal-appearing intervals.

  Thurstone attempted to devise a method that would represent the attitudes of a group on specific issue in the form of a frequency distribution, the baseline indicating the whole range of attitude gradation from the most favourable at one end to the least favourable at the other with a neutral zeroin between' (Thurstone L. L. and Chave E. J. 1929 cited in Young 1979: 352).
- **Summated ( Likert ) Scale:** Likert scaling was developed by Rensis Likert in 1932. This is also referred to as the 'method of summated ratings' because a respondent's score is computed by summing the

response values. It is like marks obtained by a student in a test. It is a uni-dimensional scaling method. It is the most widely used scaling technique to assess social attitudes. It is a very popular rating scale for measuring ordinal data in social science research. This scale includes Likert items that are simply-worded statements to which respondents can indicate their extent of agreement or disagreement on a five or seven-point scale ranging from "strongly disagree" to "strongly agree". Unlike the differential scale, the Likert scale uses only the definitely favourable and unfavourable statements. Likert scale excludes the intermediate opinions. This scale consists of a series of statements to which the respondent is to react. Likert scale needs a minimum of two categories, such as 'agree' and 'disagree'. To know the degree of intensity it may further be divided into five or seven point response scale like; 'Strongly approve', 'approve', 'undecided', 'disapprove', 'strongly disapprove' etc. These five points will constitute the scale. Each point of the scale carries a score. "Strongly approve" is given the highest score (5 or +2) and "strongly disapprove" is given the least score (1 or -2). The score values are not indicated in the questionnaire. The following is a Likert type scale:

**Statement 1: Prohibition should be made compulsory**

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly approve | Approve | Undecided | Disapprove | strongly disapprove |
| (5 or +2) | (4 or +1) | (3 or 0) | (2 or -1) | (1 or -2) |

A key characteristic of a Likert scale is that even though the statements vary in different items or indicators, the anchors ("strongly disagree" to "strongly agree") remain the same. Likert scales are ordinal scales because the anchors are not necessarily equidistant, even though sometimes we treat them like interval scales. Likert scale is considered more reliable because under it respondents answer each statement included

in the instruments and it also provide more information and data. It takes less time to construct; it is frequently used by the students of opinion research.



**CHECK YOUR PROGRESS**

**Q 6:** a) From which language the word 'scale' originated?

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b) Mention the different types of scale

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- **Sociometric Scale:** The term 'Sociometry' relates to its Latin etymology, 'socius' meaning companion, and 'metrum' meaning measure. Sociometry deals with social relations among groups and individuals. Sociometry is a "method for discovering, describing, and evaluating social status, structure and development through measuring the extent of acceptance or rejection between individuals in groups."

  The term is closely associated with the work of the Austrian-born psychiatrist J.L. Moreno, who developed the method as a research and therapeutic technique. Sociometry has come to have several meanings; it is most commonly applied to the quantitative treatment of preferential interpersonal relations, but it is also used to mean the quantitative treatment of all kinds of interpersonal relations. Sociometric techniques have been widely utilized by sociologists, psychologists and psychiatrists in the study of group structure, social status and personal traits. It helps to make more explicit and precise the configuration of group relationships, the characteristics and composition of cliques and other elements in a larger group. A Sociometric measure assesses the attractions within a given group. The basic technique involves asking all group members to identify specific persons within the group they

would prefer (or would not prefer) to have as partners in a given activity. Many variations on this technique exist for studying different aspects of social preference. For example, a group's networking structure can be exposed through the Sociometric technique of recording all interactions between group members. Helen Jennings has defined Sociometry as "means of presenting simply and graphically the entire structure of relations existing at a given time among members of a given group." Generally Sociometry is concerned with the social interactions among social groups.

Sociometry is based on the principle of sociometric test. Moreno first applied "sociometric test" in his empirical study regarding the groupings in public school in USA. Sociometric method has been used quite extensively in social research by many writers like Moreno, Jennings, Festinger etc. In this test, every member of a group may be asked to select a specified number of people from within, who could be made his friend leader and colleague, and so on. Sociometry is fundamentally concerned with the social interactions among social groups. The interaction may be of any type. This method can provide useful data/information about the position of an individual in the group in relation to other groups and sub-groups. Interview and questionnaire are the two main methods for administering sociometric tests. In his test of girls training school, Moreno used this personal interview technique. In the interview each girl was questioned as to her attitude toward those choosing or rejecting her for each criterion. Did she like, dislike, or feel indifferent toward those indication attraction or repulsion toward her? Motivation for attraction and rejection was also investigated in the interview in order to obtain a clearer picture of each girl's position in the social structure. These are easy to administer and are suitable for different situations. Sociometry has been defined as "a method for discovering, describing, and evaluating social status, structure, and development through measuring the extent of acceptance or rejection between individuals in groups." A careful sociometric study may prove very useful in revealing the social interrelations, the pattern of

acceptance and rejection and the growth of leadership in a society. This method is appropriate for studying the areas having inter-disciplinary interests. The method can be utilized without a large scale investment of resources and hence, has special relevance in low-developed countries. In sociometric test it is difficult to secure reliable information. This problem is same as the problems occurring in case of attitude scales, case techniques and questionnaires. Sociometric techniques have to be used with discrimination and carefully adapted to each situation.



**CHECK YOUR PROGRESS**

**Q 7:** Whose work is associated with the term sociometry? Discuss about sociometric test.

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- **Reliability of Scale:** There are various techniques available in social science research through which the reliability of scale is determined.
  - *Retest method.* According to this method, the same scale is applied twice to the same population for the same objectives, and if the two results are similar, the scale is regarded as reliable.
  - *Multiple form.* According to this technique, two types of scales are constructed, and they are applied to the same population. In case the two results are more or less similar, the scales may be regarded as reliable.
  - *Split-Half Method.* In this method the scale may be divided into two equal parts. Then each part is taken as a whole and measurement is made separately. The correlation between the two scores obtained in this way is estimated and if the degree of correlation is high, the scale may be regarded as reliable.

## 5.7 IMPORTANCE OF SCALING

In our daily life we rely on different types of standardized tools of measurement. For example, a petrol dispensing machine in a petrol bunk measures the volume of petrol we ask for. A shop keeper uses a weighing machine to measure the required quantity. In the case of measuringtemperature, a thermometer is used which is believed to be a standardized instrument. Similarly height, distance and a whole lot of other things which are part and parcel of our daily life are measured using standardized instruments. Scaling is useful in a number of ways. It improves objectivity. The matter under study can be expressed accurately. Scaling makes the matter concise. A lot of material is expressed with brief and to the point numbers.

Unlike the ones mentioned above, measuring social behaviour (attitudes, perceptions, preferences, or opinion) is difficult for its complexity. It is complex because social behaviour cannot be precisely explained or reduced to certain causal factors. For example, preferences of voters towards candidates in elections are conditioned by several factors like voters' awareness levels, socio-economic background of the voter, and profile of contesting candidates, parties and so on. Hence, it is difficult to single out a factor for preference of a particular candidate by a specific voter.

However, through an intensive and scientific exercise, researcher may be able to explain the attitude of voters in a particular constituency towards contesting candidates. This is possible through a set of statements which is carefully worded and ordered in a scientific manner. Scaling, therefore, helps in assessing the attitudes or opinions of respondents with a higher degree of accuracy. Despite the use of Scaling techniques in psychological measurement and other areas of research; there also have some limitations of the application of scaling techniques.

## 5.8 DIFFICULTIES IN APPLICATION OF SCALING TECHNIQUES

Application of Scaling technique is not an easy task in social science

research. As we know that human nature, behaviour, thinking is not same with each other. For that reason, it is not universally applicable. Human behaviour is heterogeneous and unpredictable. Social phenomena are complex and qualitative in nature. The concepts themselves are not defined properly. Thus quantitative measurement is a baffling affair. Social phenomena cannot be experimented in a controlled way. The phenomenamay be individual, private or esoteric. Therefore, they cannot be properly watched and evaluated. Thus, scale cannot measure all the causative variables involved. We know that human behaviour is flexible and variations are there. Whatever attitude is expressed at a point of time may not be taken as reliable. Even a valid scale may not remain valid during the period of analysis.

In spite of these difficulties, the scaling techniques can be improved to measure the social phenomena. It is important for social science researches.



**LET US KNOW**

**Scale:** A scale represents a series of ordered steps at fixed intervals used as a standard of measurement. Scales are used to rank people's judgments of objects, events, or other people from low to high or from poor to good.

**Sociometry:** The term Sociometry relates to its Latin etymology, 'socius' means companion, and metrum meaning measure. Sociometry deals with social relations among groups and individuals. Sociometry is a "method for discovering, describing, and evaluating social status, structure and development throughmeasuring the extent of acceptance or rejection between individuals in groups."



## 5.9 LET US SUM UP

- After identifying the topic of research, the researcher has to decide on the method and technique of data collection. There are two sources of data- Primary and Secondary.

- Primary data are those data which are collected for the first time and are original in nature.
- Secondary data means data that are already available i.e. they refer to the data which have already been collected and analysed by someone else.
- The most important methods of gathering primary data are: Interview method; Observation, Focus Group discussion etc while journals; books, magazines and newspapers; reports prepared by research scholars, universities; public records and statistics, historical documents and other sources of published information comprise the secondary data.
- Observation is an important technique of collecting primary data. Observation can be both participant as well as non participant.
- In Participant Observation the researcher tries to make himself/herself a member of the group he or she is studying, while in Non Participant Observation the researcher is not an active participant.
- Interview in simple words mean oral/verbal inquiring and response or verbal communication.
- The term sampling refers to the selection of a section or a part of a group with the aim of collecting information about the whole group. There are basically two type of Sampling design-Probability Sampling; Non-Probability Sampling.
- A questionnaire is one which consists of a number of questions printed or typed in a definite order or on a form or set of forms. It is given to the respondents who are expected to read and understand and write down their reply in the space provided.
- Scales are commonly used by people in their day to day activities.
- The word scale comes from the Latin word, 'scala', which means ladder or flight of steps.
- There are four types of scales namely; Nominal scale, Ordinal scale, Interval scale and Ratio scale.
- There are different attitude scales like; point scale, likert scale, Thurstone scale etc.

## 5.10 FURTHER READING

1) Goode, W. J and Hatt, P.K. 2006. Methods in Social Research. Delhi: Surajeet Publication.
2) Jahoda, Marie, Morton Deutsch, and Stuart W. Cook. 1951. Research Methods in Social Relations. New York: Dryden.
3) Thurstone, L. L, .and E. J. Chave. 1929. The Measurement of Attitudes Chicago: University of Chicago Press.
Guthrie Gerard, Basic Research Methods: An Entry to Social Science Research. New Delhi: Sage publication. India. 2010.
4) Kothari C.R. Research Methods and Techniques. New Delhi: New Age International Publisher. 2004,
5) Young, P.V. Scientific Social Surveys and Research. New Delhi: Prentice Hall, 2009.

## 5.11 ANSWER TO CHECK YOUR PROGRESS

**Ans to Q. No. 1:** Participant Observation is a method of data collection where the researcher tries to be an active participant and makes himself a member of the group he or she is studying.

**Ans to Q. No. 2:** Unstructured interviews are those where the researcher raises the questions in a conversational form. The questions are not predetermined or pre-set; rather the questions are picked up from the opinions given by the researcher.

**Ans to Q. No. 3:** No, non participant observation is not a source of secondary data; rather it is a source of primary data.

Ans to Q.No.4: Questionnaire involves less cost because the researcher does not have to visit every respondent, especially those who are at a far off place. It saves money that one would have to incur if he/she has to visit and attend to each respondent.

**Ans to Q. No. 5:** Sometimes it becomes difficult to receive the questionnaires back from the respondents and then it delays the whole process. It takes a long time to collect the questionnaires from the

respondents and hence it is considered a slow method.

**Ans. to Q. No. 6:** a) Latin word scala

b) Point Scale, Thurstone scale, Likert scale

**Ans. to Q. No. 7:** Sociometry is based on the principle of sociometric test. Moreno first applied "sociometric test" in his empirical study regarding the groupings in public school in USA. Sociometric method has been used quite extensively in social research by many writers like Moreno, Jennings, Festinger etc. In

The term is closely associated with the work of the Austrian-born psychiatrist J.L. Moreno, who developed the method as a research and therapeutic technique. Sociometry has come to have several meanings; it is most commonly applied to the quantitative treatment of preferential interpersonal relations, but it is also used to mean the quantitative treatment of all kinds of interpersonal relations. Sociometric techniques have been widely utilized by sociologists, psychologists and psychiatrists in the study of group structure, social status and personal traits. It helps to make more explicit and precise the configuration of group relationships, the characteristics and composition of cliques and other elements in a larger group. The basic technique involves asking all group members to identify specific persons within the group they would prefer (or would not prefer) to have as partners in a given activity. Many variations on this technique exist for studying different aspects of social preference. For example, a group's networking structure can be exposed through the Sociometric technique of recording all interactions between group members. Helen Jennings has defined Sociometry as "means of presenting simply and graphically the entire structure of relations existing at a given time among members of a given group." Generally Sociometry is concerned with the social interactions among social groups.



## 5.12 POSIBLE QUESTIONS

**A. Short Questions** (Answer within 150 words)

**Q 1:** Why is data the most important component of research?

**Q 2:** Distinguish between primary and secondary data?

**Q 3:** What is semi structured interview?

**Q 4:** Define scaling.

**Q 5:** Write about the attitude scale.

**B. Long Questions** (Answer within 300-500 words)

**Q 1:** Discuss the Bogardus and sociometric scale

**Q 2:** Explain the importance of Scaling techniques? What are the limitations of using scaling method in Social Science Research?

**Q 3:** Discuss in detail the methods used for collecting primary data.

**Q 4:** What is sampling? How is probability sampling different from non probability sampling?

**Q 5:** 'Data Collection involves different methods and techniques'. Elaborate the Statement.

*** ***** ***

# UNIT 6: SAMPLING

## UNIT STRUCTURE


6.1 Learning Objectives

6.2 Introduction

6.3 Sampling Concepts

6.4 Sampling Error and Non Sampling Error

6.5 Sampling Design Process

6.6 Non- Probabilistic and Probabilistic Sampling Technique

6.6.1 Non- Probabilistic Sampling Technique

6.6.2 Probabilistic Sampling Technique

6.7 Determination of Sample Size

6.8 Let Us Sum Up

6.9 Further Reading

6.10 Answer to Check Your Progress

6.11 Model Questions


## 6.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- differentiate a sample from a census and identify the conditions that favour the use of a sample versus a census.
- discuss the sampling design process
- classify sampling techniques as non probability and probability sampling techniques.
- describe the non probability sampling techniques of convenience, judgmental, quota, and snowball sampling.
- describe the probability sampling techniques of simple random, systematic, stratified, and cluster sampling.
- learn the determination of the Sample Size in a Research Project.
- discuss the Means and Proportions method for determination of Sample Size.

## 6.2 INTRODUCTION

This unit introduces you to the fundamental concepts of sampling and the qualitative considerations necessary to answer these questions. We address the question of whether or not to sample and describe the steps involved in sampling. Next, we present non probability and probability sampling techniques. We discuss the method of how to determine the sample size in the research process.

## 6.3 SAMPLING CONCEPTS

Sampling is one of the components of a research design. The formulation of the research design is the third step of the research process. At this stage, the information needed to address the research problem has been identified and the nature of the research design (exploratory, descriptive, or causal) has been determined. Furthermore, the scaling and measurement procedures have been specified, and the questionnaire has been designed. The next step is to design suitable sampling procedures. Sampling design involves several basic questions:
(1) Should a sample be taken? (2) If so, what process should be followed? (3) What kind of sample should be taken? And (4) How large should it be?

## 6.4 SAMPLING ERROR AND NON-SAMPLING ERROR

A population is the total of all the elements that share some common set of characteristics. Each marketing research project has a uniquely defined population. The objective of most research projects is to obtain information about the characteristics of a population, for example, the proportion of consumers loyal to a particular brand of toothpaste. The researcher can obtain information about population characteristics by taking either a census or a sample. A census involves a complete count of all elements in a population. A sample is a subgroup of the population selected for the marketing research project.

Budget and time limits are obvious constraints favouring the use of a sample. A census is both costly and time-consuming to conduct. A census is unrealistic if the population is large, as it is for most consumer products. In the case of many industrial products, however, the population is small, thus making a census feasible as well as desirable. For example, in investigating the use of certain machine tools by automobile manufacturers, a census would be preferred to a sample. Another reason for preferring a census in this case is that variance, or variability, in the characteristic of interest is large. For example, machine tool usage at Ford will vary greatly from the usage at Honda. Small population sizes as well as high variance in the characteristic to be measured favour a census.

If the cost of sampling errors is high (e.g., if the sample omitted a major manufacturer like Ford, the results could be misleading), a census, which eliminates such errors, is desirable. Sampling errors are errors resulting from the particular sample selected being an imperfect representation of the population of interest. Non Sampling errors, on the other hand, can be attributed to sources other than sampling. They result from a variety of causes, including errors in problem definition, approach, scaling, questionnaire design, survey methods, interviewing techniques, and data preparation and analysis. The high cost of non sampling errors (e.g., interviewing errors because of lack of supervision), on the other hand, would favour sampling. A census can greatly increase non sampling errors to the point that these errors exceed the sampling errors of a sample. Non sampling errors are found to be the major contributor to total error, whereas random sampling errors have been relatively small in magnitude. Hence, in most cases involving large populations, accuracy considerations would favour a sample over a census. This is one of the reasons that the Bureau of the Census checks the accuracy of various censuses by conducting sample surveys. However, it is not always possible to reduce non sampling error sufficiently to compensate for sampling error, as would be the case in a study involving automobile manufacturers In general, in marketing research projects dealing with consumers or households, a census is not

feasible and a sample should be taken. However, in many business- to-business or industrial marketing situations where the population size is small, a census is feasible as well as desirable.



**CHECK YOUR PROGRESS**

**Q 1:** Define Population and Sample.

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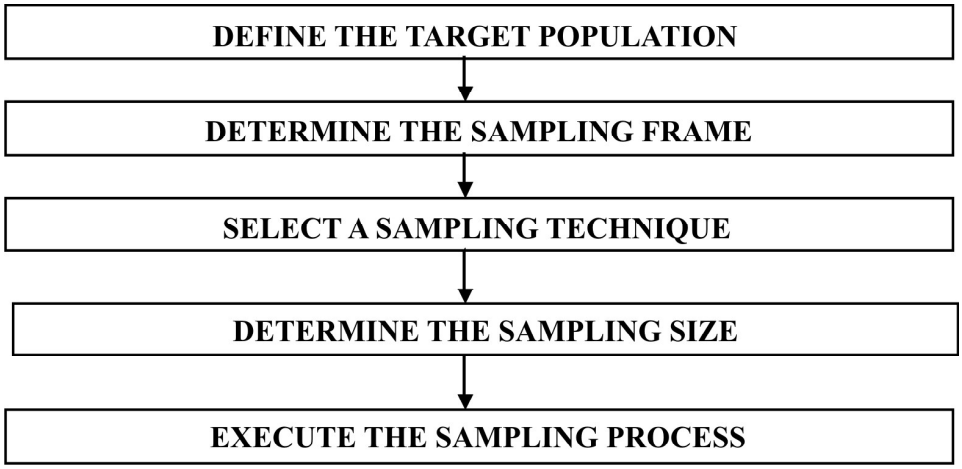
**Q 2:** What are Sampling Errors and Non Sampling Errors ?

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## 6.5 SAMPLING DESIGN PROCESS

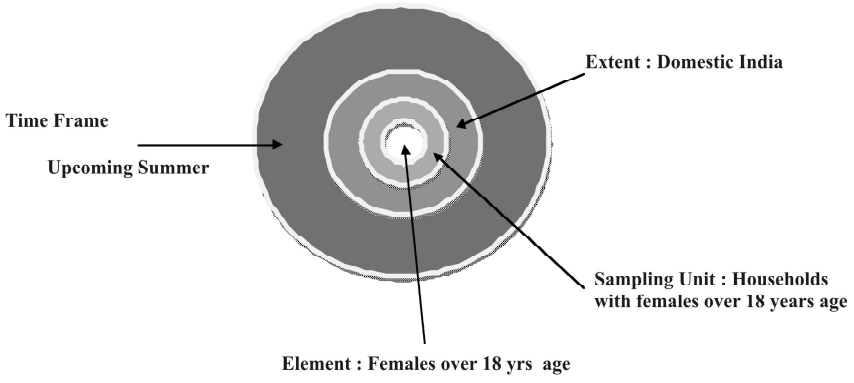
The sampling design process includes five steps, which are shown sequentially in the figure below. These steps are closely interrelated and relevant to all aspects of the marketing research project, from problem definition to the presentation of the results. Therefore, sample design decisions should be integrated with all other decisions in a research project.




- **Define the Target Population:** Sampling design begins by specifying the target population. The target population is the collection of elements or objects that possesses the information sought by the researcher

and about which inferences are to be made. Inference involves projection or generalization of the sample results to the target population, as illustrated in the section entitled Classification of Sampling Techniques. The target population must be defined precisely. Imprecise definition of the target population will result in research that is ineffective at best and misleading at worst. Defining the target population involves translating the problem definition into a precise statement of who should and should not be included in the sample.

The target population should be defined in terms of elements, sampling units, extent, and time. An element is the object about which or from which the information is desired. In survey research, the element is usually the respondent. A sampling unit is an element, or a unit containing the element, that is available for selection at some stage of the sampling process, for example, a household. Suppose that Revlon wanted to assess consumer responses to a new line of lipsticks and wanted to sample females over 18 years of age. It may be possible to sample females over the age of 18 directly, in which case a sampling unit would be the same as an element. Alternatively, the sampling unit might be households. In the latter case, households would be sampled and all females over age 18 in each selected household would be interviewed or one selected from each sampled household, for example, by using the next birthday method. Here, the sampling unit and the population element are different. Extent refers to the geographical boundaries, and the time frame is the time period under consideration. Defining the target population is illustrated in the figure below.



- **Determine the Sampling Frame:** A **sampling frame** is a representation of the elements of the target population. It consists of a list or set of directions for identifying the target population. Examples of a sampling frame include the telephone book, an association directory listing the firms in an industry, a mailing list purchased from a commercial organization, a city directory, or a map. If a list cannot be compiled, then at least some directions for identifying the target population should be specified, such as random digit dialing procedures in telephone surveys. Often it is possible to compile or obtain a list of population elements, but the list may omit some elements of the population or include other elements that do not belong. Therefore, the use of a list will lead to sampling frame error. In some instances, the discrepancy between the population and the sampling frame is small enough to ignore. In most cases, however, the researcher should recognize and treat the sampling frame error.
- **Select a Sampling Technique:** The most important decision about the choice of sampling technique is whether to use probability or non probability sampling. Given the importance of this decision, the issues involved are discussed in great detail later in this unit. If the sampling unit is different from the element, it is necessary to specify precisely how the elements within the sampling unit should be selected. In in-home personal interviews and telephone interviews, merely specifying the address or the telephone number may not be sufficient. For example, should the person answering the doorbell or the telephone be interviewed, or someone else in the household? Often, more than one person in a household may qualify. For example, both the male and female head of household may be eligible to participate in a study examining family leisure activities. When a probability sampling technique is being employed, a random selection must be made from all the eligible persons in each household. A simple procedure for random selection is the next birthday method.
- **Determine the Sample size:** Sample size refers to the number of elements to be included in the study. Determining the sample size is

complex and involves several qualitative and statistical considerations. Important qualitative factors that should be considered in determining the sample size include (1) the importance of the decision, (2) the nature of the research, (3) the nature of the analysis, (4) sample sizes used in similar studies, and (5) resource constraints.

In general, for more important decisions, more information is necessary and the information should be obtained more precisely. This calls for larger samples, but as the sample size increases, each unit of information is obtained at greater cost and less benefit. The nature of the research also has an impact on the sample size. For exploratory research designs, such as those using qualitative research, the sample size is typically small. For conclusive research, such as descriptive surveys, larger samples are required. If sophisticated analysis of the data using advanced statistical techniques is required, the sample size should be large. The same applies if the data are to be analyzed in great detail. Thus, a larger sample would be required if the data are being analyzed at the subgroup or segment level than if the analysis is limited to the aggregate or total sample. Sample size is influenced by the average size of samples in similar studies. Table 6.1 gives an idea of sample sizes used in different marketing research studies. These sample sizes have been determined based on experience and can serve as rough guidelines, particularly when non probability sampling techniques are used.

The sample size decision should be guided by a consideration of the resource constraints. In any marketing research project, money and time are limited. Other constraints include the availability of qualified personnel for data collection. Based on all the foregoing considerations, the sample size in a research project was determined to be 1,000. The statistical considerations involve the variability (variance) of the characteristic being measured and other considerations. Statistically, a sample of 400 (385 to be more precise) is sufficient to yield estimates of percentages that meet commonly acceptable statistical standards.

**Table 6.1 Sample Sizes Used in Marketing Research Studies**

| Type of Study | Minimum Size | Typical Range |
|---|---|---|
| • Problem-identification research (e.g., market potential) | 500 | 1,000–2,500 |
| • Problem-solving research (e.g., pricing) | 200 | 300–500 |
| • Product tests | 200 | 300–500 |
| • Test marketing studies | 200 | 300–500 |
| • TV/radio/print advertising (per commercial or ad tested) | 150 | 200–300 |
| • Test-market audits | 10 stores | 10–20 stores |
| • Focus groups | 2 groups | 10–15 groups |

### Execute the Sampling Process

Execution of the sampling process requires a detailed specification of how the sampling design decisions with respect to the population, sampling frame, sampling unit, sampling technique, and sample size are to be implemented. If households are the sampling units, an operational definition of a household is needed. Procedures should be specified for vacant housing units and for call backs in case no one is at home. Detailed information must be provided for all sampling design decisions.



**CHECK YOUR PROGRESS**

**Q 1:** What is a Sampling Unit ?

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**Q 2:** What is Sample Size?

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## 6.6 NON PROBABILISTIC & PROBABILISTIC SAMPLING TECHNIQUES

Sampling techniques may be broadly classified as non probability and probability.

Non probability sampling relies on the personal judgment of the researcher rather than chance to select sample elements. The researcher

can arbitrarily or consciously decide what elements to include in the sample. Non probability samples may yield good estimates of the population characteristics. However, they do not allow for objective evaluation of the sampling errors. Because there is no way of determining the probability of selecting any particular element for inclusion in the sample, the estimates obtained are not statistically projectable to the population; that is, one cannot derive inferences about the population based on the sample results. Thus, if 35 percent of the people in a sample selected by non probability sampling express preference for a new service, we cannot conclude that 35 percent of the target population will have the same preference. Commonly used non probability sampling techniques include –

- Convenience Sampling,
- Judgmental Sampling,
- Quota Sampling and
- Snowball Sampling.

In probability sampling, sampling units are selected by chance. Because sample elements are selected by chance, it is possible to determine the accuracy of the sample estimates of the characteristics of interest, for example, the percentage expressing preference for a new service. This permits the researcher to make inferences or projections about the target population from which the sample was drawn. Thus, if 35 percent of the people in a sample selected by probability sampling express preference for a new service, we can conclude that it is likely that 35 percent of the target population will have the same preference. Probability sampling techniques consist of –

- Simple Random Sampling,
- Systematic Sampling,
- Stratified Sampling and
- Cluster Sampling.



**CHECK YOUR PROGRESS**

**Q 5:** What are the different types of Probability and Non Probability Sampling Techniques ?

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### 6.6.1 Non-Probabilistic Sampling Techniques

- **Convenience Sampling:** Convenience sampling attempts to obtain a sample of convenient elements. The selection of sampling units is left primarily to the interviewer. Often, respondents are selected because they happen to be in the right place at the right time. Examples of convenience sampling include (1) use of students, church groups, and members of social organizations; (2) mall-intercept interviews without qualifying the respondents; (3) department stores using charge account lists; and (4) “people on the street” interviews. Convenience sampling is the least expensive and least time-consuming of all sampling techniques. The sampling units are accessible, easy to measure, and cooperative. In spite of these advantages, this form of sampling has serious limitations. Many potential sources of selection bias are present, including respondent self-selection (that is, respondents can influence their selection or non selection). Convenience samples are not representative of any definable population. Hence, it is not meaningful to generalize the sample results to any population from a convenience sample, and convenience samples are not appropriate for marketing research projects involving population inferences. Convenience samples are not recommended for descriptive or causal research, but they can be used in

exploratory research for generating ideas, insights, or hypotheses. Convenience samples can be used for focus groups, pretesting questionnaires, or pilot studies. Even in these cases, caution should be exercised in interpreting the results.

- **Judgmental Sampling:** Judgmental sampling is a form of convenience sampling in which the population elements are selected based on the judgment of the researcher. The researcher, exercising judgment or expertise, chooses the elements to be included in the sample because he or she believes that they are representative of the population of interest or are otherwise appropriate. Common examples of judgmental sampling include (1) test markets selected to determine the potential of a new product, (2) purchase engineers selected in industrial marketing research because they are considered to be representative of their respective companies, and (3) bellwether precincts selected in voting behavior research.
- **Quota Sampling:** Quota sampling may be viewed as two-stage judgmental sampling. The first stage consists of developing control categories, or quotas, of population elements. To develop these quotas, the researcher lists relevant control characteristics and determines the distribution of these characteristics in the target population. The relevant control characteristics, which may include gender, age, and race, are identified on the basis of judgment. Often, the quotas are assigned so that the proportion of the sample elements possessing the control characteristics is the same as the proportion of population elements with these characteristics. In other words, the quotas ensure that the composition of the sample is the same as the composition of the population with respect to the characteristics of interest. In the second stage, sample elements are selected based on convenience or judgment. Once the quotas have been assigned, there is considerable freedom in selecting the elements to be included in the sample. The only requirement is that the elements

selected fit the control characteristics.

Even if the sample composition mirrors that of the population with respect to the control characteristics, there is no assurance that the sample is representative. If a characteristic that is relevant to the problem is overlooked, the quota sample will not be representative. Relevant control characteristics are often omitted because practical difficulties are associated with trying to include many control characteristics. Because the elements within each quota are selected based on convenience or judgment, many sources of selection bias are potentially present. The interviewers may choose to go to selected areas where eligible respondents are more likely to be found. They may avoid people who look unfriendly or are not well dressed, or those who live in undesirable locations. Quota sampling does not permit assessment of sampling error. Quota sampling attempts to obtain representative samples at a relatively low cost. Its advantages are the lower costs and greater convenience to the interviewers in selecting elements for each quota. Recently, tighter controls have been imposed on interviewers and interviewing procedures that tend to reduce selection bias, and guidelines have been suggested for improving the quality of mall-intercept quota samples. Under certain conditions, quota sampling obtains results close to those for conventional probability sampling.

- **Snowball Sampling:** In snowball sampling, an initial group of respondents is selected, usually at random. After being interviewed, these respondents are asked to identify others who belong to the target population of interest. Subsequent respondents are selected based on the referrals. This process may be carried out in waves by obtaining referrals from referrals, thus leading to a snowball effect. Even though probability sampling is used to select the initial respondents, the final sample is a non probability sample. The referrals will have demographic

and psychographic characteristics that are more similar to the persons referring them than would occur by chance.

A major objective of snowball sampling is to estimate characteristics that are rare in the population. Examples include users of particular government or social services, such as food stamps, whose names cannot be revealed; special census groups, like widowed males under age 35; and members of a scattered minority population. Snowball sampling is used in industrial buyer–seller research to identify buyer–seller pairs. The major advantage of snowball sampling is that it substantially increases the likelihood of locating the desired characteristic in the population. It also results in relatively low sampling variance and costs.

### 6.6.2 Probabilistic Sampling Technique

Probability sampling techniques vary in terms of sampling efficiency. Sampling - efficiency reflects a trade-off between sampling cost and precision. Precision refers to the level of uncertainty about the characteristic being measured. Precision is inversely related to sampling errors but positively related to cost. The greater the precision, the lower the sampling errors and the greater the cost, and most studies require a trade-off. The researcher should strive for the most efficient sampling design, subject to the budget allocated. The efficiency of a probability sampling technique may be assessed by comparing it to that of simple random sampling.

- **Simple Random Sampling:** In simple random sampling (SRS), each element in the population has a known and equal probability of selection, and every element is selected independently of every other element. The sample is drawn by a random procedure from a sampling frame. This method is equivalent to a lottery system in which names are placed in a container, the container is shaken, and the names of the winners are then

drawn in an unbiased manner.

To draw a simple random sample, the researcher first compiles a sampling frame in which each element is assigned a unique identification number. Then random numbers are generated to determine which elements to include in the sample. The random numbers may be generated with a computer routine or a table. This was illustrated in a Case where a computer program was used to randomly generate household telephone numbers. SRS has many desirable features. It is easy to understand. The sample results may be projected to the target population. Most approaches to statistical inference assume that the data have been collected by simple random sampling. However, SRS suffers from at least four significant limitations. First, it is often difficult to construct a sampling frame that will permit a simple random sample to be drawn. Second, SRS can result in samples that are very large or spread over large geographic areas, thus increasing the time and cost of data collection. Third, SRS often results in lower precision than other probability sampling techniques. In fact, the efficiency of other probability sampling techniques is often assessed by comparing it to that of simple random sampling (SRS). Fourth, SRS may or may not result in a representative sample. Although samples drawn will represent the population well on average, a given simple random sample may grossly misrepresent the target population. This is more likely if the size of the sample is small. For these reasons, SRS is not widely used in marketing research. Procedures such as systematic sampling are more popular.

- **Systematic Sampling:** In systematic sampling, the sample is chosen by selecting a random starting point and then picking every ith element in succession from the sampling frame. The sampling interval, i, is determined by dividing the population size N by the sample size n and rounding to the nearest integer. For example, there are 100,000 elements in the population, and

a sample of 1,000 is desired. In this case, the sampling interval, i, is 100. A random number between 1 and 100 is selected. If this number is 23, for example, the sample consists of elements 23, 123, 223, 323, 423, 523, and so on.

Systematic sampling is different from SRS in that only the initial element is selected randomly and the remaining elements are selected systematically, that is, by adding i to the previous element number. In SRS, all the elements are selected randomly.

For systematic sampling, the researcher assumes that the population elements are ordered in some respect. When the ordering of the elements is related to the characteristic of interest, systematic sampling increases the representativeness of the sample. If firms in an industry are arranged in increasing order of annual sales, a systematic sample will include some small and some large firms. A simple random sample may be unrepresentative because it may contain, for example, only small firms or a disproportionate number of small firms. If the ordering of the elements produces a cyclical pattern, systematic sampling may decrease the representativeness of the sample. To illustrate, consider the use of systematic sampling to generate a sample of monthly department store sales from a sampling frame containing monthly sales for the last sixty years. If a sampling interval of 12 is chosen, the resulting sample would not reflect the month-to-month variation in sales. Let's say that a random number from 1 to 12 is selected, and let's say that 3 is the number selected, representing the month of March. Thus, the sample will consist of 3, 15 (3 + 12), 27 (3 + [2 × 12]), and the month of March will be selected for each of the sixty years. In this case, the monthly variation in sales for each year would not be reflected in the sample.

Systematic sampling is less costly and easier than SRS because random selection is done only once. The random numbers do not have to be matched with individual elements,

as in SRS. Another relative advantage is that systematic sampling can even be used without knowledge of the composition (elements) of the sampling frame. For example, every ith person leaving a department store or mall can be intercepted. For these reasons, systematic sampling is often employed in consumer mail, telephone, and mall-intercept interviews

- **Stratified Sampling:** Stratified sampling is a two-step process in which the population is first partitioned into subpopulations, or strata. The strata should be mutually exclusive and collectively exhaustive in that every population element should be assigned to one and only one stratum and no population elements should be omitted. Next, elements are selected from each stratum by a random procedure, usually simple random sampling (SRS). Technically, only SRS should be employed in selecting the elements from each stratum. In practice, sometimes systematic sampling and other probability sampling procedures are employed. Stratified sampling differs from quota sampling in that the sample elements are selected probabilistically rather than based on convenience or judgment. A major objective of stratified sampling is to increase precision without increasing cost.

  The variables used to partition the population into strata are referred to as stratification variables. The criteria for the selection of these variables consist of homogeneity (similarity), heterogeneity (dissimilarity), relatedness, and cost. The elements within a stratum should be as homogeneous (similar) as possible, but the elements in different strata should be as heterogeneous (different) as possible. The stratification variables should also be closely related to the characteristic of interest. The more closely these criteria are met, the greater the effectiveness in controlling extraneous sampling variation. Finally, the variables should decrease the cost of the stratification process by being easy to measure and apply.

Variables commonly used for stratification include demographic characteristics (as illustrated in the example for quota sampling), type of customer (credit card versus non–credit card), size of firm, or type of industry. It is possible to use more than one variable for stratification, although more than two are seldom used because of pragmatic and cost considerations.

- **Cluster Sampling:** In cluster sampling, the target population is first divided into mutually exclusive and collectively exhaustive subpopulations, or clusters. Then a random sample of clusters is selected, based on a probability sampling technique such as simple random sampling. For each selected cluster, either all the elements are included in the sample or a sample of elements is drawn probabilistically. If all the elements in each selected cluster are included in the sample, the procedure is called one-stage cluster sampling. If a sample of elements is drawn probabilistically from each selected cluster, the procedure is two-stage cluster sampling.

  The key distinction between cluster sampling and stratified sampling is that, in cluster sampling, only a sample of subpopulations (clusters) is chosen, whereas in stratified sampling, all the subpopulations (strata) are selected for further sampling. The objectives of the two methods are also different. The objective of cluster sampling is to increase sampling efficiency by decreasing costs. The objective of stratified sampling is to increase precision. With respect to homogeneity and heterogeneity, the criteria for forming clusters are just the opposite of that for strata. Elements within a cluster should be as heterogeneous (different) as possible, but clusters themselves should be as homogeneous (similar) as possible. Ideally, each cluster should be a small-scale representation of the population. In cluster sampling, a sampling frame is needed only for those clusters selected for the sample. A common form of cluster sampling is area sampling, in which the clusters consist of

geographic areas, such as counties, housing tracts, or blocks.



**CHECK YOUR PROGRESS**

**Q 6:** Write note on Convenience Sampling and Snowball Sampling.

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**Q 7:** Discuss about Simple Random Sampling and Cluster Sampling.

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## 6.7 DETERMINATION OF SAMPLE SIZE

Sample Size determination is computed using three inputs:

- The estimate of the population standard deviation (often obtained from earlier studies).
- The acceptable level of sampling error
- The desired confidence level

Generally, research practitioners utilize the following sequence and inputs in computing sample size:

- Survey respondents will split 50/50 in response to dichotomous (e.g. yes/no) questions.
- The desired level of confidence will be 95%, or 1.96 standard deviations from the mean or .05 possible

Py = Proportion responding “yes”

Pn = Proportion responding “no”

Standard error is the acceptable amount of error/confidence interval. Let us consider it as .05/1.96 (about 2 standard deviations), or .0255102.

The standard formula for computing the sample size is:

(Py) (Pn)

Std Error2

So, when the respective values are input, we end up with .25/ .0006507 or 384 respondents. This is why a survey sample size of 400 is often recommended.

Sample size is important in avoiding Type I or Type II errors.

Type I errors are made by stating that there is a difference between two groups within a population on a given measurement, when in fact there is no difference. Accommodating this potential outcome is where most sample size calculations stop. Often, practitioners simply ignore the possibility of making a Type II error.

The sample size typically needed to address Type I errors is 384.

Type II errors are made by stating that there is no difference between two groups within a population on a given measurement, when in fact there is a difference. While important, many researchers ignore statistical power calculations. In the "real world" tables and canned statistical tools are utilized to determine survey power, due to the complexity of the formulas.

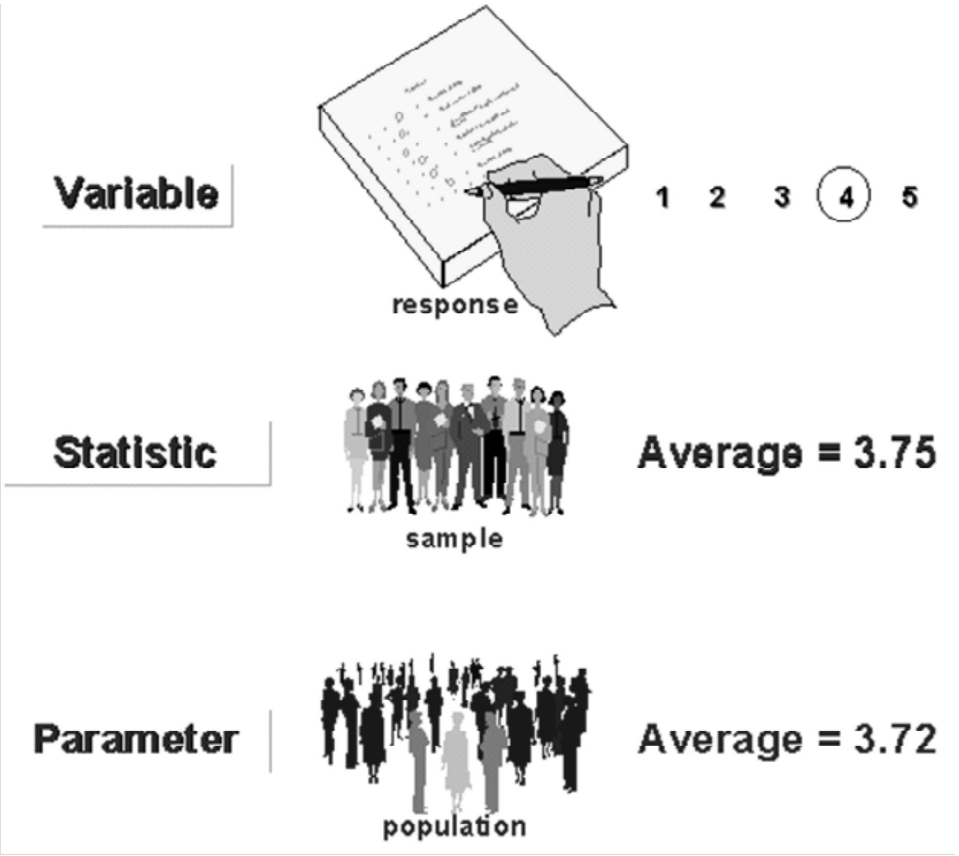
The sample size typically needed to address Type II errors is 1,236.

**Confidence level** suggests that other samples drawn from the same population will have similar values X% of the time. For most marketing research exercises, confidence levels are set at 95%.

**Confidence interval** includes the possible end point values for the entire population. The confidence interval allows for a computed amount of variation from the mean value based on the precision/cost value trade-off.

**Sampling Error:** Any characteristic of the population related measure is called a parameter. It is a fixed value as long as the population does not change.

The picture shows population. Say it includes 1000 people and the average of their response is 3.72. It is known as population mean –a parameter.




The picture also shows a sample. Let us say, it consists of 100 people. The sample mean is 3.75 and it is called a statistic. The difference between the statistic and the parameter is called sampling error. Each sample will generate a different amount of sampling error. In this case it is 3.75-3.72 = 0.03.

**Sampling Distribution of Mean:** The distribution of responses of sample elements form a sampling distribution with a mean and variations. To understand, let us to do an exercise. Imagine the population of 5 elements say [1, 2, 3, 4, 5]. The mean value of the population = [1+2+3+4+5]/5 =3

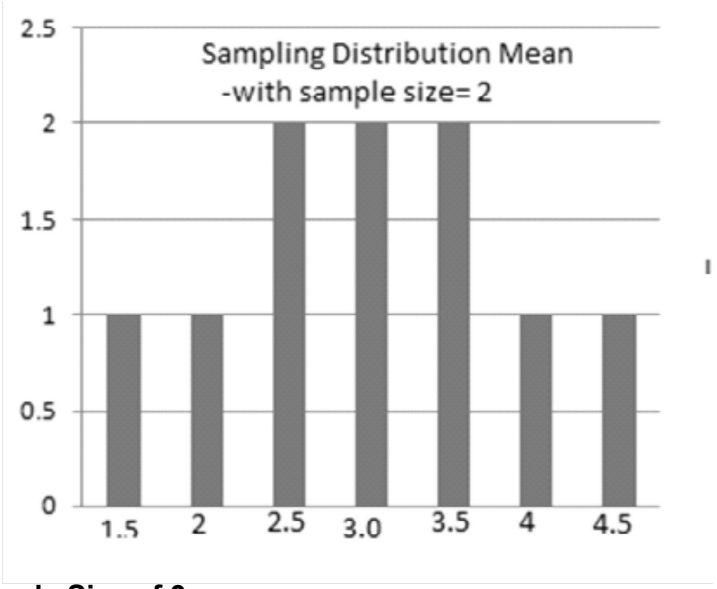
Let us assume that you have taken sample sizes of 2, 3 and 4.

**Sample Size -2 units**

For the sample size of 2, you know that a maximum of 10 possible unique samples can be selected [5C2 = 5 *4 /1 * 2 = 10]. If you look at a glance of this distribution of sampling means, it is varying from 1.5 to 4.5.

| SL.NO | SAMPLE ELEMENTS | MEAN OF THE SAMPLE |
|---|---|---|
| 1 | 1,2 | 1.5 |
| 2 | 1,3 | 2 |
| 3 | 1.4 | 2.5 |
| 4 | 1,5 | 3 |
| 5 | 2,3 | 2.5 |
| 6 | 2,4 | 3 |
| 7 | 2,5 | 3.5 |
| 8 | 3,4 | 3.5 |
| 9 | 3,5 | 4 |
| 10 | 4.5 | 4.5 |

Distribution of Sampling Means for a sample size 2

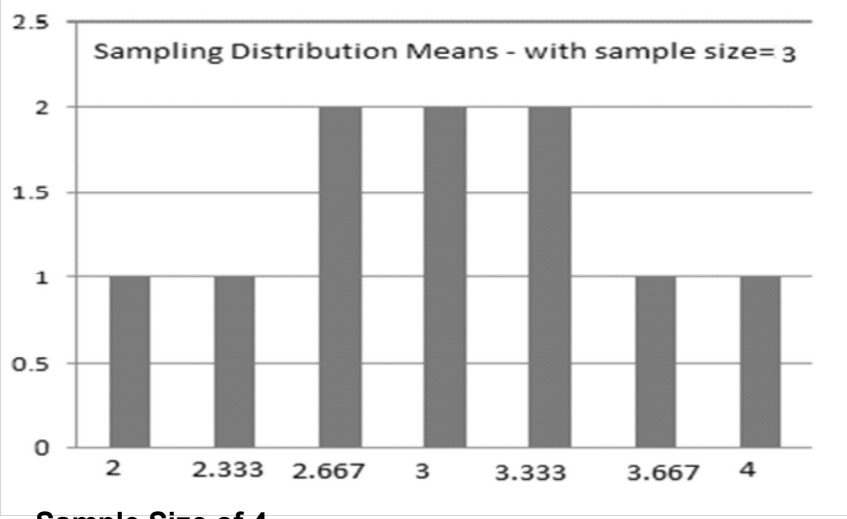



**Sample Size of 3**

A maximum of 10 possible unique samples can be selected [5C3 = (5 * 4 * 3) / (1*2*3) = 10]. If you look at a glance of this distribution of sampling means, it is varying from 2.0 to 4.0

| SL.NO | SAMPLE ELEMENTS | MEAN OF THE SAMPLE |
|---|---|---|
| 1 | 1,2,3 | 2 |
| 2 | 1,2,4 | 2.3333 |
| 3 | 1.2.5 | 2.6666 |
| 4 | 1,,3,4 | 2.666 |
| 5 | 1,3,5 | 3 |
| 6 | 1,4,5 | 3.3333 |
| 7 | 2,3,4 | 3 |
| 8 | 2,3,5 | 3.3333 |
| 9 | 2,4,5 | 3.666 |
| 10 | 3,4,5 | 4 |

Distribution of Sampling Means for a sample size 3

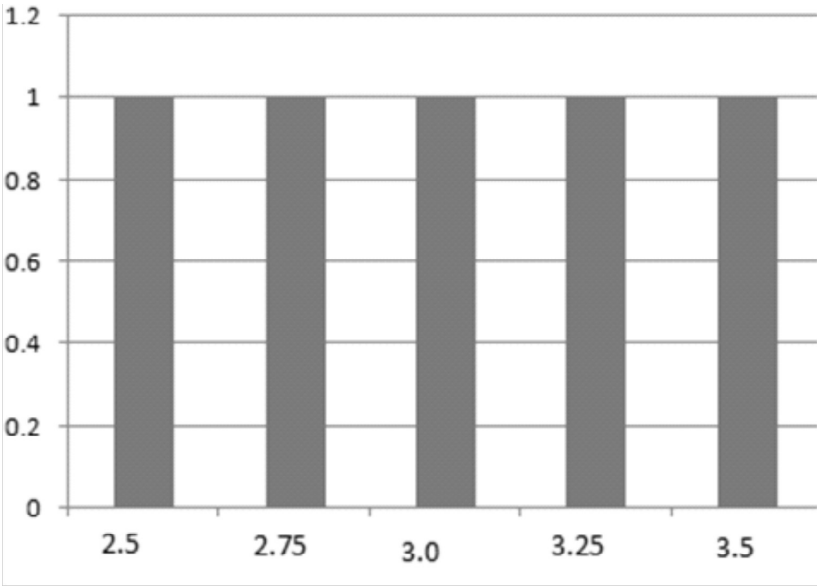



**Sample Size of 4**

A maximum of 5 possible unique samples can be selected [5C4 = (5 * 4 * 3 * 2) / (1*2*3*4) = 5]. If you look at a glance of this distribution of sampling means, it is varying from 2.5 to 3.5.

| SL.NO | SAMPLE ELEMENTS | MEAN OF THE SAMPLE |
|---|---|---|
| 1 | 1,2,3,4 | 2.5 |
| 2 | 1,2,4,5 | 3 |
| 3 | 1,3,4,5 | 3.25 |
| 4 | 1,2,3,5 | 2.75 |
| 5 | 2,3,4,5 | 3.5 |

Distribution of Sampling Means for a sample size 3




In each case the average of means is equal to 3. Therefore we can say, for a finite population, different sample may or may not have mean equal to population. But the mean of the distribution will be equal to

population mean. The standard deviation of each of these samples represents the distribution of potential sampling error, which in statistical terminology is known as standard error.

Even though all three samples came from the same population, you would not expect to get the exact same statistic from each. They would differ marginally just due to the random “luck of the draw” or to the natural fluctuations or vagaries of drawing a sample. But you would expect that all three samples would yield a similar statistical estimate because they were drawn from the same population.

Now, if we extend the same logic to an infinite number of samples from a population, which consist of 1000s of members. Even for a sample size of 100, [1000C100 = you can calculate...] countable samples [of course in millions] can be drawn, which is theoretically possible to do and if we compute the average for each one.

If you plotted them on a histogram or bar graph you should find that most of them converge on the same central value and that you get fewer and fewer samples that have averages farther away up or down from that central value. In other words, the bar graph would be well described by the bell curve shape that is an indication of a “normal” distribution in statistics. The distribution of an infinite number of samples of the same size as the sample in your study is known as the sampling distribution of means.



## 6.8 LET US SUM UP

- Sampling is preferred when the cost of sampling error is low, and the cost of non sampling error is high. The opposite set of conditions favor the use of a census. Sampling design begins by defining the target population in terms of elements, sampling units, extent, and time. Then the sampling frame should be determined. A sampling frame is a representation of the elements of the target population. It consists of a list or directions for identifying the target population. At this stage, it is important to recognize any sampling frame errors that may exist. The next step involves selecting a sampling technique and determining the

sample size. In addition to quantitative analysis, several qualitative considerations should be taken into account in determining the sample size. Finally, execution of the sampling process requires detailed specifications for each step in the sampling process.

- Sampling techniques may be classified as non probability and probability techniques. Non probability sampling techniques rely on the researcher's judgment. Consequently, they do not permit an objective evaluation of the precision of the sample results, and the estimates obtained are not statistically projectable to the population. The commonly used non probability sampling techniques include convenience sampling, judgmental sampling, quota sampling, and snowball sampling.
- In probability sampling techniques, sampling units are selected by chance. Each sampling unit has a nonzero chance of being selected. It is also possible to determine the precision of the sample estimates and to make projections to the target population. Probability sampling techniques include simple random sampling, systematic sampling, stratified sampling, and cluster sampling. The choice between probability and non probability sampling should be based on the nature of the research, relative magnitude of sampling and non sampling errors, and statistical and operational considerations.



## 6.9 FURTHER READING

1) Malhotra, N.K. and Dash, S. (2011). Marketing research: An Applied Orientation(6th edition), New Delhi: Pearson Education.



## 6.10 ANSWERS TO CHECK YOUR PROGRESS

**Answer to Q. 1:** A population is the total of all the elements that share some common set of characteristics. A sample is a subgroup of the population selected for the marketing research project.

**Answer to Q. 2:** Sampling errors are errors resulting from the particular sample selected being an imperfect representation of the population of interest. Non Sampling errors, on the other hand, can be attributed to

sources other than sampling.

**Answer to Q. 3:** A sampling unit is an element, or a unit containing the element, that is available for selection at some stage of the sampling process.

**Answer to Q. 4:** Sample size refers to the number of elements to be included in the study.Important qualitative factors that should be considered in determining the sample size include (1) the importance of the decision, (2) the nature of the research, (3) the nature of the analysis, (4) sample sizes used in similar studies, and (5) resource constraints.

**Answer to Q. 5:** Probability sampling techniques consist of :Simple Random Sampling, Systematic Sampling, Stratified Sampling, and Cluster Sampling.

Non probability sampling techniques include:Convenience Sampling, Judgmental Sampling, Quota Sampling and Snowball Sampling.

**Answer to Q. 6:** Convenience sampling attempts to obtain a sample of convenient elements. The selection of sampling units is left primarily to the interviewer. Often, respondents are selected because they happen to be in the right place at the right time.

In snowball sampling, an initial group of respondents is selected, usually at random. After being interviewed, these respondents are asked to identify others who belong to the target population of interest.

**Answer to Q. 7:** In simple random sampling (SRS), each element in the population has a known and equal probability of selection, and every element is selected independently of every other element.

In cluster sampling, the target population is first divided into mutually exclusive and collectively exhaustive subpopulations, or clusters.



## 6.11 MODEL QUESTIONS

**Short Questions** (Answer each question in around 150 words).

**Q 1:** What is the major difference between a sample and a census?

**Q 2:** Under what conditions would a sample be preferable to a census?

A census preferable to a sample?

**Q 3:** Describe the sampling design process.

**Q 4:** How should the target population be defined?

**Q 5:** What is a sampling unit? How is it different from the population element?

**Q 6:** What qualitative factors should be considered in determining the sample size?

**Q 7:** What are the disadvantages of non probability sampling techniques?

**Q 8:** What is the least expensive and least time-consuming of all sampling techniques? What are the major limitations of this technique?

**Q 9:** What are the advantages and disadvantages of judgmental sampling?

**Q 10:** What is the relationship between quota sampling and judgmental sampling?

**Q 11:** What are the distinguishing features of simple random sampling?

**Q 12:** Describe the procedure for selecting a systematic random sample.

**Q 13:** Describe stratified sampling. What are the criteria for the selection of stratification variables?

**Q 14:** What is the major advantage of snowball sampling?

**Q 15:** Discuss the method of determining the sample size using means and proportions.

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# UNIT 7: ACTION RESEARCH

## UNIT STRUCTURE


7.1 Learning Objectives

7.2 Introduction

7.3 Meaning of Action Research

7.3.1 Definitions of Action Research

7.3.2 Nature of Action Research

7.3.3 Need of Action Research

7.4 Scope of Action Research

7.5 Steps of Action Research

7.6 Let Us Sum Up

7.7 Further Reading

7.8 Answer to Check Your Progress

7.9 Model Questions


## 7.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- describe the meaning, concept, nature and need of Action Research;
- discuss the scope of Action Research;
- explain the steps of Action Research.

## 7.2 INTRODUCTION

Learners, this is a unit which deals with the term 'Action Research'. Before going to learn about the entire concept of Action Research you should be acquainted with the term 'Research' and its various types which you all have already understood in the previous units of this block. So, after reading this unit, you all will have a clear concept of the term 'Action Research', its nature, need, scope and its steps which means how to conduct Action Research.

Before going into the details of the concept of Action Research it is necessary for you to have a glance of evolution of the concept of Action

Research. You must know from where the term Action Research is coined.

Kurt Lewin is generally considered the 'father' of action research. A German social and experimental psychologist, and one of the founders of the Gestalt school, he was concerned with social problems, and focused on participative group processes for addressing within organizations. Lewin first coined the term 'action research' in his 1946 paper "Action Research and Minority Problems".

The concept of action research is being used in education since (1926), Backingham has mentioned this concept first in his book 'Research for teachers'. But Stephen M. Corey used this concept for solving the problems of education for the first time. Corey believed that the scientific method in education would bring about change because educators would be involved in both the research and the application of information. In the words of Corey, "We are convinced that the disposition to study …. the consequences of our own teaching is more likely to change and improve our practices than is reading about what someone else has discovered of his teaching." Corey believed that the value of action research is in the change that occurs in everyday practice rather than the generalization to a broader audience.

From the above, you all came to know from where the term action research came from. Now let us discuss the meaning of Action Research in a detail form.



**CHECK YOUR PROGRESS**

**Q 1:** Who is considered the father of Action Research?

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**Q 2:** When was the concept of action research first used in education?

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## 7.3 MEANING OF ACTION RESEARCH

Action Research is a purposeful and goal oriented activity undertaken by practitioners with the purpose of improving and modifying their practices with a view to achieving better results. It helps the practitioners to solve the problems encountered by them in their own work, so as to make themselves more effective and their practices meaningful. Thus, action research is mainly concerned with the practical problems faced by the practitioners in their respective field of working conditions. For instance, a teacher conducts action research with a view to improving his teaching practice. Action Research in education is research undertaken by practitioners in order that they may improve their practices. People who actually teach children or supervise teachers or administer school systems attempt to solve their practical problems by using the methods of science. They accumulate evidence to define their problems more sharply. Stephen M. Corey in his book Action Research in Education mentioned that the term "action research" is relatively recent and was first used by Collier and Lewin and his students. He narrated in his book that action research means much the same thing as "operational research" which was the name applied to a type of inquiry undertaken by various planning groups during the Second World War. We can understand the meaning of Action Research more clearly by going through its definitions. Let us have a look at it in the next sub-section of the unit.

### 7.3.1 Definitions of Action Research

To have a clear understanding of the meaning let us read some of the definitions of Action Research given below:

"Action Research emphasizes the involvement of teachers in problems in their own classrooms and has as its primary goal the in-service training and development of the teacher rather than the acquisition of general knowledge in the field of education."

**-Borg**

"Research concerned with school problems carried on by

school personal to improve schools practice is action research."

**-Sara Blackwell**

"Action Research is organized, investigate activity, aimed towards to study and constructive change of given endeavour by individual or group concerned with change and improvement."

**-Mc Theatre:**

"Action Research is a form of investigation designed for use by teachers to attempt to solve problems and improve professional practices in their own classrooms. It involves systematic observations and data collection which can be then used by the practitioner/researchers in reflection, discussion making and the development of more effective classroom strategies."

**-Parsons and Brown**

"Action Research is a fancy way of saying let's study what's happening at our school and decide how to make it a better place."

**-Emily Calhoun**

"Action research is a form of self-reflective enquiry undertaken by the participants (teachers, students or principals, for example) in social (including educational) situations in order to improve the rationally and justice of (a) their own social or educational practices, (b) their understanding of these practices, and (c) the situations (and institutions) in which these practices are carried out."

**-Carr and Kemmis**

"Action researches are small scale and narrowly focused researches undertaken by teachers in a given context. It has also been referred to as research into practice by practitioners, for practitioners."

**-Hammersly**

### 7.3.2 Nature of Action Research

On the basis of these definitions of action research, the following

can be drawn:

- It is a process for studying practical problems of education.
- It is a scientific procedure for finding out a practical solution of current problem.
- The practitioner can only study his problem.
- It is personal research for clinical research work.
- The focus is to improve and modify the current practices.
- The individual and group problems studied by action research.
- It does not contribute to the fund of knowledge.
- Research is directly associated with the problem.

### 7.3.3 Need of Action Research

Action research is very important for the teachers and teacher educators of all stages of education. It is an effective strategy to solve different day to day problems of the classroom. The need and importance of action research are summarized below:

- Action Research is an effective way to empower and change managers/heads of the institutions.
- Action Research is an effective way to empower and change teachers.
- It is also an effective way to empower and change students.
- It helps them (heads, teachers and students) to overcome/come out from the constraints of traditional thinking and enables them to both develop themselves and optimize the performance of their organization.
- In Action Research, educators/teachers can carry out research within their classrooms or schools to improve their teaching.
- In Action Research, educators/teachers can carry out research within their classrooms or schools to assess a newly developed educational theory.
- Action Research is also helpful to implement and evaluate an educational plan.

- It never interferes or disrupts teacher's primary role, i.e., - 'Teaching'.
- The method of data collection is not time consuming in 'Action Research'.
- In classroom research, all members of a school community can share a common vision.
- Action Research is helpful for making better decisions and engages in better actions in their (heads, teachers and administrators) day to day work.
- Finally, Action Research can be an integral part of- teaching, administration supervision and evaluation.



**CHECK YOUR PROGRESS**

**Q 3:** Who first used the term action research?

.....

.....

## 7.4 SCOPE OF ACTION RESEARCH

The scope of action research is quite wide. It is usually considered in conjunction with social or educational problems. Specifically, with respect to education we may say that under the scope of action research fall the study of the following type of problems.

- Problems dealing with the philosophy of school and class.
- Problems dealing with objectives or aims of teaching various subjects in the specialized
- Problem regarding modern youth.
- Specific problems confined to class-room behavior of the students.
- Interpersonal relations between teachers' principal and the students.
- Relations between school and community in the particular setting of the school.

- Problems related with the introduction of new courses of study or new activities.
- Administrative organization of the school.
- Teachers' accountability and code of conduct.
- Tackling with the problems, exceptional and deviant children and solving their educational problems.

The above mentioned problems are only some of the problems. There may be many more depending on a felt need during the course of teaching or working of the school. With respect to education, we may say that the scope of action research extends to the investigation of all those problems which are of immediate relevance to the school practice. The criterion on which the selection of a problem for action research is to be decided is its emergence in the course of teaching-learning process and its immediate applicability in practice.

## 7.5 STEPS OF ACTION RESEARCH

In general, the process of action research is studied with help of certain common steps. These are briefly discussed below:

- **Title of action Research:** The first step of action research process is the title which is based on the problem faced for example, by teachers, in the school setting. The problem can be selected from various sources like teaching, learning, evaluation, co-curricular activities, school administration and organisation etc. For example, in class VI, Rajib, Tanoy, Rupam, Kishor, Swapnaav and Arnab have the problem of writing spelling correctly in English. The class teacher or the researcher thinks about the causes behind why they have such problem of spelling mistake? The teacher tries to conduct an action research on these students to correct their spelling and remove mistakes. For that blackboard writing skill is used as an experimental design. With reference to this problem, the title of the action research can be written as below:

**"Effectiveness of Blackboard writing skill of teachers on Correction of Spelling Mistake in English of Class VI students of**

**Saraswati Shiksha NIketan, Mirza, Kamrup, Assam"**

In this title, the variable is Correction of spelling mistake in English. Sample of this study comprises class VI students of Saraswati Shiksha NIketan, Mirza, Kamrup, Assam.

- **Objective:** The objective of action research is always based on the title or the problem of action research. It should provide direction to the entire study. As the scope of action research is limited and conducted by class teacher in his/her class to solve his/her class problem, so one objective has to be written. For example, for the above mentioned title, following objective is written:

  To compare mean score of Spelling Test in English of class VI students before and after having taught through Blackboard Writing Skill

- **Hypothesis:** Formulation of hypothesis is the third step of action research process. In this step, the researcher formulates hypothesis on the basis of the conceptual and functional relationship between the cause and problem and the review of related literature. Hypothesis is formulated either in directional form or in null form. There must be a strong base to formulate hypothesis in directional form. In the absence of strong base, it is convenient to formulate null hypothesis. For the above mentioned objective, the following null hypothesis can be formulated:

  There is no significant difference between mean score of Spelling Test in English of class VI students before and after having taught through Blackboard Writing Skill.

- **Methodology:** Methodology is the fourth step of action research process where the researcher must include Sample, Tools, Experimental Design, Procedure of Data Collection and Data Analysis. The methodology of above mentioned problem is given below:

  - **Sample:** In action research, purposive sampling technique is used as it is not possible to collect the sample randomly. Sample of action research is not representative so the finding of action research cannot be generalized. The researcher directly takes only those

students as samples who are directly related with the problem.

It is visible from the title mentioned above that the Action Research is to be conducted on those students of class VI of Saraswati Shiksha NIketan, Mirza, Kamrup, Assam who has problem in writing spelling in English as observed by the teacher during teaching. Therefore, for the above mentioned study, Purposive Sampling Technique is to be used to select sample.

- **Tool:** Tool is very important to collect necessary data for the action research. It is always important to select appropriate tool. Tools are of two types, namely Standardized and Non-Standardized tool. Generally, Action Research is conducted by a working teacher who may not know the technical procedure of standardization of tool. So the teacher has to use non-standardized tool to collect information or data for the Action Research. Also teachers administer tools prepared by themselves which is non-standardized in nature.

  For the above mentioned problem, Spelling Test in English will be the tool for the study. This test will be prepared by the teacher only. The teacher will decide the number of questions to be included in test, type of questions and duration of test, maximum marks, etc. Teachers know that the questions are of various types such as essay type questions, short answer type and objective type. Mostly teachers prepare short answer type and objective type questions for Action Research. The number of questions depend on the subject matter and must represent the whole topic chosen for the Action Research.

- **Experimental Design:** Action Research is experimental in nature. Experimental Designs are classified into three types, such as, Pre-Experimental Design, Quasi-Experimental Design and True-Experimental Design. Among these categories, Pre-test, - Post-test Single Group Design are most suitable Experimental Design for Action Research which belongs to the category of Pre-Experimental Design. In Pre-experimental Design, one takes the group of students where they are facing problem. So the group is not the representative

of the population to which it belongs. Therefore, the findings of Action Research cannot be generalized. In the above mentioned example, one title and one objective is given for Action Research. For this Action Research, the suitable Experimental Design is Pretest-posttest Single Group Design. The layout of the design is given below:

O1 X O2

Where,

O1 = Pre-Test of variable of the Action Research

X = Treatment

O2 = Post-Test of variable of the Action Research

It is clear from the above that to start with Spelling Test in English is to be administered to all students of the class where Action Research is to be conducted. This is denoted by O1 and called Pre-test in spelling test in English. Now the teacher teaches spelling to the students by the use of Blackboard Writing for one period of 35 minutes per day for 20 days. After 20 days, the same Test is to be administered teaching with the help of Activity Based Method. This is denoted by O2 and called Post-test Spelling test in English.

- **Procedure of Data Collection:** From the Action Research title, it is evident that Action Research is to be conducted on students of Class VI of Saraswati Shiksha NIketan, Mirza, Kamrup, Assam by the teachers of English who experienced that many students failed to write word of English correctly. The teacher first administers the Spelling test in English developed by her/him. After this, s/he teaches spelling with the help of Blackboard writing at the rate of 35 minutes per day for 20 days. The teacher only has to decide the activity to be done by the students in order to correct the spelling. At the end of the treatment, the same Spelling Test in English will be administered to collect data. This is known as Post-Spelling Test in English. The duration of pre-test and post-test is decided by the teachers and it should be same for both pre-test and post-test. After this, the response sheets of each student is to score for Pre as well

as Post-tests. The total scores thus obtained are to be used during data analysis stage.

- **Data Analysis:** Data analysis is one of the systematic steps of action research. There are different statistics used in analyzing the data; such as Mean, Bar graph, Correlated or paired t-test etc. However, the teacher can also use Statistical Package for Social Sciences (SPSS) to analyze the data.

  As the above mentioned problem is Single Group Pre test-post test Design, hence Correlated t-test or Paired Samples t-test will be used in this problem to test the hypothesis.

- **Results and Interpretation:** After the analysis of data, results are shown in tabular form or in figure for graphical representation in action research and that results will be interpreted in a simple language by the teacher for easy understanding.
- **Discussion:** The teacher or researcher has to discuss the results which he gets after data analysis. Under this, the teacher gives the reasons as to why such results came. Discussion can also be done keeping in view the results of previous related researches. Apart from this, discussion can also be done keeping in mind the activities conducted during treatment, duration of the treatment, group characteristics, etc. The interpretation of results done by the teacher is a meaningful contribution which can prove to be very beneficial for the reader.
- **Supplementary Part:** This is the last part of action research report. The list of references and appendices are included in this part.

  Moreover, only understanding the steps of action research is not enough. So, you all must know the design and the way to conduct the action research which is discussed below very briefly.

  In designing and conducting an action research project, the following steps are followed:

  - ***Identification of problem:*** a teacher should be sensitive towards his/her activities. The problem is isolated from the broad field. The investigator must realize the seriousness of the problem.

- ***Defining and delimiting the problem:*** After identifying the problem, the second step is to define the problem so that action and goal may be specified. The delimitation means to localize the problem in terms of class, subject, group and period in which a teacher perceives the problem.
- ***Analyzing the probable causes of the problem:*** In the third step the causes of the problem are analyzed with the help of some evidences. The nature of causes is also analyzed whether it is under the control or beyond the control of the investigator. This helps in formulating the action hypothesis.
- ***Formulating the action hypotheses:*** A proper analysis of the problem encountered by action researcher helps him/her in formulating the action hypothesis. Action hypothesis is a statement which involves two important elements- action and goal. It indicates that the action should be taken in achieving the goal.
- ***Developing an appropriate design to test the action hypotheses:*** In order to test the action hypothesis for arriving at the solution of the problem, an action researcher needs to develop an appropriate design. A design is a specified strategy destined to ensure that the study will result in valid and reliable findings. The design of the study specifies the sample, tools to be used for collecting the data, methods to be used for analyzing the data, the period the study involved and the allocation of time for completing the study. If the hypotheses are not accepted, a second design is developed for testing another hypothesis. In action research, one hypothesis is tested at a time. The design of action research is flexible and can be changed any time according to the researcher.
- ***Conclusions of Action Research Project:*** After conducting the study, the action researcher has to determine the extent to which improvement in the situation can be achieved as a result of the implementation of the action hypothesis. Here, accepting or rejecting the action hypothesis leads to draw the conclusions. The conclusions are useful in modifying and improving the current practices of school

and classroom teaching.

The National Council of Educational Research and Training (NCERT) has been taken interest in the action research projects. The extension departments of NCERT have been conducting seminars and workshops for in-service teachers for imparting knowledge and skills of action research projects. It has developed its own paradigm of action research projects.



**CHECK YOUR PROGRESS**

**Q 4:** Mention two scope of action research.

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## 7.6 LET US SUM UP

- Kurt Lewin is generally considered the 'father' of action research. A German social and experimental psychologist, and one of the founders of the Gestalt school, he was concerned with social problems, and he focused on participative group processes for addressing problems within organizations. Lewin first coined the term 'action research' in his 1946 paper "Action Research and Minority Problems".
- The concept of action research is being used in education since (1926), Backingham has mentioned this concept first in his book 'Research for teachers'. But Stephen M. Corey used this concept for solving the problems of education for the first time.
- Action Research is a purposeful and goal oriented activity undertaken by practitioners with the purpose of improving and modifying their practices with a view to achieving better results.
- Stephen M. Corey in his book Action Research in Education mentioned that the term "action research" is relatively recent and was first used by Collier and Lewin and his students.

- Action research is very important for the teachers and teacher educators of all stages of education. It is an effective strategy to solve different day to day problems.
- The National Council of Educational Research and Training (NCERT) has been taken interest in the action research projects.

## 7.7 FURTHER READING

1) Best, J W. & Kahn, J. V. (1989). Research in Education. New Delhi: Prentice Hall of India Pvt. Ltd.
2) Bhanot, Sumon (2013). Basic of Educational Research in Methodology. New Delhi: Kanishka Publishers
3) Das, Alaka (2019). An Introduction to Action Research. Guwahati: Ashok Book Stall.
4) Kothari C. R. (1990). Research Methodology-Methods & Techniques. New Delhi: Vishwa Prakashan.
5) Saikia, P. Kalita, I & Kalita, U (2021). Fundamentals of Action Research. Guwahati: Delhi, DVS Publishers.

## 7.8 ANSWERS TO CHECK YOUR PROGRESS

**Ans to Q. 1:** Kurt Lewin is generally considered the 'father' of action research.

**Ans to Q. 2:** The concept of action research is being used in education since 1926.

**Ans to Q. 3:** The term "action research" is relatively recent and was first used by Collier and Lewin and his students.

**Ans to Q. 4:** The scope of action research falls the study of the following type of problems.

- Problems dealing with the philosophy of school and class.
- Problems dealing with objectives or aims of teaching various subjects in the specialized.

## 7.9 POSSIBLE QUESTIONS

**A. Short Questions** (Answer each question in about 150 words)

**Q 1:** Trace the evolution of the concept of action research.

**Q 2:** Enlist the nature of action research.

**Q 3:** Explain the concept of action research.

**B. Long Questions** (Answer each question in about 300-500 words)

**Q 1:** Discuss the need and scope of action research.

**Q 2:** Elaborate the steps of action research.

**Q 3:** Explain in detail how to design and conduct an action research project.

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# UNIT 8: RESEARCH DESIGN

## UNIT STRUCTURE


8.1 Learning Objectives

8.2 Introduction

8.2.1 Characteristics of Research Design

8.3 Components of Research Design

8.4 Concepts of Research Design

8.5 Types of Research Design

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8.5.2 Descriptive Research Design

8.5.3 Digonastic Research Design

8.5.4 Experimental Research Design

8.5.4.1 Types of Experimental Design

8.6 Let Us Sum Up

8.7 Further Reading

8.8 Answer to Check Your Progress

8.9 Model Questions


## 8.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- know about the meaning of research design and its importance in social research.
- identify the different components and concepts associated with research design.
- describe in detail the different types of research designs and their application.

## 8.2 INTRODUCTION

The term 'design' means "drawing an outline" or planning or arranging details. It is a process of making decisions before the situation arises in which the decision has to be carried out. 'Research Design' is

planning a strategy of conducting research. It plans as to: what is to be observed, how it is to be observed, how to record observations, how to analyse/interpret observations, and how to generalize . Research design is, thus, a detailed plan of how the goals of research will be achieved.

A research design is the systematic and logical planning for action. It provides direction to research project. In precise, it may be called as a plan for collecting and analysing data in an efficient and relevant manner. It is a blue print and therefore at its best only tentative changes in the design are permitted and are dictated by considerations during the operations of the project. In other words, a research design is not a highly specific plan to be followed without deviation but rather a series of guide-posts to keep one headed in the right direction. Research design has been defined by different social scientists in different terms.

Miller has defined “Designed Research” as “The planned sequence of the entire process involved in conducting a research study.”

According to Selltiz and others, “Research design is a catalogue of the various phases and facts relating to the formulation of a research effort. It is an arrangement of the essential conditions for collection and analysis of data in a form that aims to combine relevance to research purpose with economy in the procedure”.

### 8.2.1 Characteristics of Research Design:

In the field of social sciences the designing of a research study is very complex . Every design has its own strength and weakness and at the same time there is no such thing as a single correct design. Nevertheless a good research design should posses the following characteristics.

- **Objectivity:** The objectivity of the procedure(either collection of data or scoring of the responses or both) may be judged by the degree of agreement between the final scores assigned to different individuals by more than one independent observer. The more subjective the observation, recording and evaluation

of the response, the less the different observers agree. Therefore any research design should permit the use of measuring instruments which are fairly objective at which every observer or judge seeing a performance arrives precisely. This ensures the objectivity of the collected data to be used for the analysis and findings.

- **Reliability:** The test retest approach is the most effective measure of reliability as it refers to 'consistency' throught out a series of measurements. Suppose if a respondent gives a response to a question he/she is expected to give the same response to that question whenever he is asked in other form. But if the respondent keeps on changing his/her responses to the same type of questions then the interviewer will be facing a difficulty in considering which of the responses is genuine. The researcher should frame this question in such a way that the respondent cannot but give only one genuine response. Though there are some methods in determining the reliability of the responses given by a respondent like.
- **Validity:** As in case of reliability, there are a good number of procedures for establishing the validity of test, such as validating the present data against a concurrent criterion or a future criterion or a theory etc. However, any measuring instrument is said to be valid when it measures what it proposes to measure.
- **Generalisation:** The next important aspect of a good research design is to ensure that the measuring instruments used in a research investigation yield objective, reliable and valid data for 'generalisation' of the findings. It will thus help an investigator in his attempt to generalize the findings, provided he has taken care in defining the population , selecting the sample and using the appropriate statistical analysis while planning his/her research design.



**CHECK YOUR PROGRESS**

**Q 1:** What is research design?

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**Q 2:** Write any two characteristics of a research design?

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## 8.3 COMPONENTS OF RESEARCH DESIGN

As discussed earlier, Research Design outlines how the research will be carried out. Therefore it addresses itself to certain key issues as mentioned below.

- Title of the study, '…should be brief, precise and project the scope in generalized terms.'
- Statement of the Problem, '…should be unambiguous, precise and the usage should be clear, simple and concise.'
- Review of Previous studies- '…should be a brief survey of a relevant literature in the subject concerned and presented subjectwise. Studies should be reviewed critically and from there further research is called for'
- Definition of Concept or Theoritical Principles involved, '…should be defined in general times and be linked with the study.'
- Coverage and Scope of the Study, '…should consider geographical, temporal and functional dimension.'
- Objectives of the study, '…should explain the main purpose precisely and in the form of question or an explanation to a particular issue.'
- Formulation of Hypothesis, '…should be empirical, conceptually clear, specific, close to things observable and related to the body of theory.'
- Methods of Investigation, '…depends upon the nature of study but

researcher should define the methodology and techniques adopted.'

- Sampling design-'…definition of the universe or population, size of the sample and representatives of the sample should be defined.'
- Constructing of Schedule or Questionnaire-'…questions should be in a order or a form. Open ended questions are designed to permit a free response. The questions to be asked should have a direct bearing on the problem, avoiding the personal questions and multiple meaning.'
- Data Collection, '…depends upon the subject matter the unit of enquiry and the scope of the study.'
- Analysis of Data, '…to fulfil the objective or hypothesis the researcher should analyse the data and subject to the appropriate statistical analysis beside tabulation. Tabulation of results in a meaningful way is by itself a technique and an art. The data given in the tables must be in self-explanatory form
- Interpretation of Results-'…researcher should draw inference based on usual test for significance and relate with previous findings, for a wider field of generalization.
- Reporting and Findings: Reporting should be clear, specific, simple and related relating to the objective of the study. Researcher must report what has been discovered to ensure proper directions to other researchers in carrying out of similar researches.'



**CHECK YOUR PROGRESS**

**Q 3:** How should be the title of a research be designed?

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**Q 4:** What should be the Reporting and Findings of a research design like?

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## 8.4 CONCEPTS OF RESEARCH DESIGN

Before describing the different research design, it will be appropriate to explain the various concepts relating to designs so that these may be easily understood.

- **Dependent and independent variables:** A concept which can take on different quantitative values is called a variable. As such, the concepts like weight, height, income are all examples of variables. Qualitative phenomena (or the attributes) are also quantified on the basis of the presence or absence of the concerning attribute(s). Phenomena which can take on quantitatively different values even in decimal points are called ' continuous variable'. But all variables are not continuous, If they can only be, expressed in integer values, they are non-continuous variables or in statistical language discrete variables. Age is an example of continuous variable, but the number of children is an example of non-continuous variable. If one variable depends upon or is a consequence of another variable it is termed as an dependent variable. For instance if we say that height depends upon age, then height is a dependent variable and age is an independent variable Further if in addition to being dependent upon age , height also depends upon individual's sex , then height is a dependent variable and age and sex are independent variables.
- **Extraneous variable:** Independent variables which are not related to the purpose of the study, but may affect the dependent variable are termed as extraneous variable. Suppose the researcher wants to test the hypothesis that there is a relationship between children's social studies achievement and their self-concepts. In this case, self-concept is an independent variable and social studies achievement is a dependent variable.
- **Control:** One important characteristic of a good research design is to minimize the influence or effect of extraneous variable(s). The technical term 'control'' is used when we design the study minimizing the effects of extraneous independent variables. In experimental researches, the

term 'control' is used to refer to restrain experimental conditions.

- **Confounded relationship:** When the dependent variable is not free from the influence of extraneous variable(s) the relationship between the dependent and independent variables is said to be confounded by an extraneous variable(s)
- **Research hypothesis:** When a prediction or a hypothesized relationship is to be tested by scientific methods, it is termed as research hypothesis. The research hypothesis is a predictive statement that relates an independent variable to a dependent variable. Usually, a research hypothesis must contain at least one independent and one dependent variable
- **Experimental and non-experimental hypothesis-testing research:** When the purpose of research is to test a research hypothesis, it is termed as hypothesis-testing research. It can be of the experimental design or of the non-experimental design. Research in which the independent variable is manipulated is termed as'experimental hypothesis-testing research'and a research in which an independent variable is not manipulated is called'non-experimental hypothesis-testing research'.
- **Experimental and control groups:** In an experimental hypothesis-testing research when a group is exposed to usual conditions, it is termed as á control group', but when the group is exposed to some novel or special condition it is termed as an experimental group.
- **Treatments:** The different conditions under which experimental and control groups are put are usually called treatments.
- **Experiments:** The process of examining the truth of a statistical hypothesis relating to some research problem is known as experiment.
- **Experimental unit(s):** The pre-determined plots or the blocks where different treatments are used are known as experimental units. Such experimental units must be selected(defined) very carefully.



**CHECK YOUR PROGRESS**

**Q 5:** What do you mean by independent variable?

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**Q 6:** What is research hypothesis?

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## 8.5 TYPES OF RESEARCH DESIGN

On the basis of Research purpose, research studies may broadly be categorized into four types:

### 8.5.1 Exploratory or Formulative Design

The main purpose of exploratory research is to gather information which will help in future for formulation of a precise research problem. On the basis of the collected facts the researcher may be able to formulate sound hypothesis for further research. It may also enable the researcher to get himself/herself acquainted with the phenomena which he/she expects to investigate at a later stage. The aim of an exploratory or formulative study may be clarification of concepts, establishing priorities for future research and collection of data about the actual conditions which affect an intended research. An exploratory research employs exploratory design.

- **Requirements of Exploratory Design**

  The essentials for exploratory or formulative design are:

➢ Review of pertinent literature: While proceeding in the path of research, the researcher has to take help from the work already done by his/her predecessors. By doing so he/she will not only save himself/herself from the problem of trial and error but also

minimize the expenditure of his/her energy.

- Experience Survey: Because of the complicated nature of social problems a researcher may not be in a position to collect all the required materials about a particular problem from one place. At times the researcher has to contact the persons who have earned enough experience to understand and analyse the social reactions.
- Analysis of Insight stimulating cases: Analysis of insight stimulating cases includes all those events, incidents and phenomenan that stimulate the researcher. Such cases invoke in the investigator the thinking required for the formulation of the hypotheses. In this regard the attitude of the investigator, intensity of the case study and integrative power of investigators appear to be very important.

### 8.5.2 Descriptive Research Design

The purpose of descriptive research design is to describe some event, situation, people, group or community or some phenomenon. Fundamentally it is a fact finding exercise which focuses on relatively far dimensions of a well defined entity, aiming at precise and systematic measurement of some dimensions of a phenomenon. Usually a descriptive design involves detailed numerical descriptions, such as distribution of a population of a community by age, sex, caste or education. The researcher may also take recourse to descriptive design for estimating the proportion of people in a particular geographical locality with respect to their specific view or attitudes.

However the procedure followed in descriptive design is broadly analogous, notwithstanding the differences evinced in their field, formulation of hypothesis, objectives, for treatment of the problem and in matters of field expansion.

### 8.5.3 Diagonistic Research Design

The diagonistic research design endeavours to find out the relationship between express causes and also suggests ways and means for the solution. Thus the diagonistic studies are concerned with discovering and testing whether certain variables are associated. Such studies may also aim at determining the frequency with which something occurs or the ways in which a phenomena is associated with some other factors.

Diagonistic studies are mostly motivated by hypothesis. A primary description of a problem serves the basis so as to relate the hypotheses with the source of the problem. Here only those data which form and corroborate the hypotheses are collected. With regards to the objective of diagonistic research design, it is based on such knowledge which can also be motivated or put into practice to find solution of the problem. Therefore it is obvious that the diagonistic design is concerned with both the cause as well as the treatment.

Diagonistic studies seek immediate to timely solution of causal elements. The researcher before going through other references, endeavours to remove and solve the factors and the causes responsible for giving rise to the problem.

The research design of diagonistic studies demands strict adherence to objectivity for elimination of any chances of personal bias or prejudice. Utmost care is taken while taking decisions regarding variables, nature of observation to be made in the field, the type of evidence to be collected and tools of data collection. Simultaneously the research economy should be carefully calculated. Any faulty decision in this regard will result in wastage of time, energy and money.

Usually the first step in such designing is accurate formulation of a research problem wherein the research objectives are precisely stated and principal areas of investigation are properly linked.

Otherwise the investigator will find it difficult to ensure the collection of required data in a systematic manner. Simultaneously, the clarification of concepts and the operational definition of the terms should be ensured so as to make them amenable to measurement. At the next stage, certain decisions regarding collection of data are taken. In this regard, the researcher should always calculate in mind the advantages and disadvantages of the method to be employed and at the same time the nature of research problem, type of data needed, degree of desired accuracy etc. should be considered. Again, while collecting data, efforts should be made to maintain objectivity to the maximum possible extent.

In order to surmount problem of the financial constraints and paucity of time, a representative sample of the research universe should be drawn so as to gather relevant information. A wide range of sampling techniques are prevalent which must be made use of appropriately by the researchers.

At the stage of analysis of data, the researcher must take proper care in placing each item in the appropriate category, tabulating of data, applying statistical computation and so on.

### 8.5.4 Experimental Design

The concept of experimental design in sociological research refers to systematic study of human relations by making the observations under conditions of control. In the words of Jahoda and Cook, ‘ an experiment may be considered as a way of organizing the collection of evidence so as to permit one to make inference about the tenability of a hypothesis. According to Chapin, “experiment is simply observation under controlled conditions. When observation alone fails to disclose the factors that operate in a given problem, it is necessary for the scientist to resort to experiment.”

In real terms, experimentation is resorted to when it is not possible to solve the problem through observation and general

knowledge. The core of the experimental method lies in drawing inferences by observation of human relations under controlled conditions. Since a number of factors are in operation in every complex social situation, the social scientist , while seeking to describe the single causal relation of suppose factor A to factor B, must attempt to create an artificial situation wherein all other factors such as C, D, E etc., are controlled. Such a state is achieved by selecting two groups which are equal in all significant receipts and by choosing either of the groups as 'experimental group and the other as the 'control group' and thereafter exposing the 'experimental group' to the assumed causal variable, while keeping the 'control' group under control. After a specific time period, the two groups are compared in terms of the 'assumed effect'. The assumed causal variable and the assumed effect are otherwise called the independent variable and dependent variable respectively.

The three components of experimental design are: comparison, manipulation and control.

Through comparison, the correlation between variables is known. It also enables us to demonstrate the association between two or more variables.

Through manipulation the researcher establishes the time order of events. The major evidence which becomes essential to determine the sequence of events is that a change occurs only after the activation of independent variable. In other words the independent variable precedes the dependent variable.

### 8.5.4.1 Types of Experimental Design

There are numerous ways in which experiments can be done in the field of social sciences. In their work "Experimental and Quasi-Experimental Designs of Research on Teaching", Donald T.Cambell and Julian C. Stanley have mentioned more than a hundred ways of conducting experiments which may be designated as experimental

design. But from the analytical point of view seven broad categories may be mentioned:

- **After only design:** Among all categories of designs, after only design appears to be the simplest. This consists in measuring the dependent variable only after the experimental subjects have been exposed to the experimental variable. This design is considered more appropriate as an exploratory study than a real experiment.
- **Before-after design:** As the name suggests, in this design measurement of the dependent variable is taken before as well as after exposure of the subject to the experimental variable, and the difference between the two measurements is taken to be the effect of the experimental variable. For example if the measured value of the dependent variable before exposure to the subject of the experimental variable is noted as 'A' and its measured value after the exposure of the subject to experimental variable is noted as 'B' then the effect of the experimental variable is taken to be (B-A).
- **Before-after with control group design:** In this design the research has a control group against which the results of the experimental group are compared. The control group and experimental groups are selected in such a way that both the groups are similar and interchangeable. The control group is measured before as well as after being exposed to the experimental variable. Hence there may hardly be any difference between before and after measurements. But if there is any difference between before and after measurements, it represents the result of uncontrolled variables.

  On the other hand the experimental variable is introduced in the experimental group. The difference between before and after measurements in respect of the experimental group is construed as the result of experimental variable as well as the uncontrolled variables. To know the exact effect of the

experimental variable, the researcher deducts the difference of the two measurements of the experimental group.

The following notation explains this

| | Control Group | Experiment Group |
|---|---|---|
| Whether before-measurement is taken ? | Yes (A) | Yes (C) |
| Whether experimental variable is introduced ? | No | Yes |
| Whether after-measurement is taken ? | Yes (B) | Yes (D) |
| Effect of experimental variable | (D-C)-(B-A) | |

- **Four group-six study design:** In this type of design two experimental groups and two control groups are taken. Measurements are made in six cases, i.e. before- measurement and after measurement in respect of the experimental group -1, and after measurement in experimental group-2, before and after measurement in respect of control group 1; and only after measurement in control group 2.

  Before measurements in all the four identical groups will be almost the same. If the before-measurements have no effect on the variable being studied, the two experimental groups should provide the same after-measurements and similarly the two control groups should also give the same after measurements. However the results of the two experimental groups are most likely to be different from the results of the two control groups, if the experimental variable exerts any influence.

- **After only with control group design:** This is also known as two group-two study design, which is a modification of the four groups study design. Here the researcher does not study the experimental variable under different conditions. Hence the effect of experimental variable under different conditions. The effect of experimental variable is determined simply by finding out the

differences between the after-measurements in respect of experimental and control groups. It happens so because if before-measurements of the experimental group-2 and control group-2 are taken, those are likely to be same due to the identical characteristics of the groups. On this presumption the researcher may very well ignore them.

**We can express the design by the following notation**

| | Experiment Group | Control Group |
|---|---|---|
| Whether before-measurement is taken ? | No | No |
| Whether experimental variable is introduced ? | No | Yes |
| Whether after-measurement is taken ? | Yes (A) | Yes (B) |
| Effect of experimental variable | (A-B) | |

- **Ex-post facto design:** In Ex-post facto design the experimental and control groups are selected after the introduction of the experimental variable. Thus, it can be called a variation of the after-only design. The main advantage of this design is that the subjects are not influenced towards the subject by their knowledge of being tested. It also enables the researcher to introduce the experimental variable according to his/her own will and to control his/her observation.
- **Factorial Design:** All categories of experimental designs discussed above are designed to test experimental variables at one level only. But on the other hand the factorial designs enable the experimenter to test two or more variables simultaneously.



**CHECK YOUR PROGRESS**

**Q 7:** What is the main purpose of an exploratory or formulative design?

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**Q 8:** What is descriptive research design?

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**Q 9:** With what is the Diagnostic research design concerned?

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**Q 10:** What is Experimental Research Design?

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**Q 11:** What are the three components of Experimental Research Design?

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**Q 12:** What is Before-after design of experimental research design?

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## 8.6 LET US SUM UP

- Dependent and independent variable, Extraneous variable, Control, Confounded relationship etc are some of the important concepts of research design.
- Research design can broadly be classified into four types: Exploratory or Formulative Design, Descriptive Research Design, Diagonistic

Research Design and Experimental Research Design

- The main aim of an exploratory study is clarification of concepts, establishing priorities for future research and collection of data about the actual conditions which affect an intended research.
- The main purpose of descriptive design is to describe some event, situation, people, group or community or some phenomena.
- The diagonistic research design endeavours to find out the relationship between causes and suggest ways and means for the solution.
- The core of experimental research design lies in drawing inferences by observation of human relations under conditions of control.
- Experimental Design is to three types.



## 8.7 FURTHER READING

1) Ackoff, Russell L. 1961. The Design of Social Research Chicago: University of Chicago Press.
2) Ghosh, B.N. 1982. Scientific Methods and Social Research, New Delhi: Sterling Publishers Pvt.Ltd.



## 8.8 ANSWER TO CHECK YOUR PROGRESS

**Ans. to Q.No.1:** A Research Design is a plan of action. It is a plan for collecting and analyzing data in an efficient and relevant manner.

**Ans. to Q.No.2:** Reliability and Generalisation are any two characteristics of a research design.

**Ans. to Q.No.3:** The title of a study should be brief, precise and project the scope in generalized terms.

**Ans. to Q.No.4:** The reporting and finding of a study should be clear, specific, simple and directly relating to the objective of the study.

**Ans. to Q.No.5:** When a variable depends upon or is a consequence of the other variable it is termed as an independent variable.

**Ans. to Q.No.6:** When a prediction or a hypothesized relationship is to be tested by scientific methods, it is termed as research hypothesis.

**Ans. to Q.No.7:** The main purpose of exploratory or formulative design is

to gather information which will help in future for formulation of a precise research problem.

**Ans. to Q.No.8:** A Descriptive Research Design is such a design which describes events, situation, people, group or community or some phenomena.

**Ans. to Q.No.9:** The Diagonistic Research design is concerned with the express characteristic and existing social problems.

**Ans. to Q.No.10:** Experimental Research design refers to systematic study of human relations by making the observation under conditions of control.

**Ans. to Q.No.11:** The three components of Experimental Research design are : comparison, manipulation and control.

**Ans. to Q.No.12:** The Before-after experimental design is such a design where measurement of the dependent variable is taken before as well as after exposure of the subject to the experimental variable, and the difference between the two measurements is taken to be the effect of the experimental variable.



## 8.9 POSSIBLE QUESTIONS

**A. Short Questions** (Answer within 150 words)

**Q 1:** Define Research Design and mention its characteristics.

**Q 2:** Differentiate between Dependent and Independent variable.

**Q 3:** What are the essentials of an Exploratory or Formulative study?

**B. Long Questions** (Answer within 300-500 words)

**Q 1:** Describe the different components of research design ?

**Q 2:** Describe in detail about descriptive research design ?

**Q 3:** Define experimental research design and describe its types?

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