

## Chapter 5

# Research Planning and Sampling

The third step of any social studies research is to prepare a research design. Research design is a mapping strategy which is based on sampling technique. It essentially includes objectives, sampling, research strategy, tools and techniques for collecting the evidences, analysing the data and reporting the findings. Thus, research design is the statement of the object of the inquiry and how a satisfactory culmination to be effected. A research design is the work before getting the project underway.

### MEANING OF RESEARCH PLAN/DESIGN

Research design is a choice of an investigator about the components of his project and development of certain components of the design. A design of research does not consists of an ordered sequential step-by-step procedure. It is a planning stage of research which is usually made logically visualizing its practicability. The selection of research components is done keeping in view of the objectives of the research. Research hypotheses also provide the basis for designing a research work. A research design includes the following components :

- (a) Research method or research strategy.
- (b) Sampling design.
- (c) Choice of research tools, and
- (d) Choice of statistical techniques.

A design of research is good or not, it is judged by standards such as the degree of accuracy attainable on the level of relevant evidence sought. A distinction should be drawn between statistical significance and substantive significance and appropriately applied. Above all, a good research design must be practical.

The review of the literature and related research reports are set as an important component of design. Also the classification and development of the classes of inquiry and their models are offered as major aspects of research design. Designing of research may be described as a mapping, because the research design components tend to fit into three distinct but interrelated parts; it is convenient to discuss the design components within these three components.

Kerlinger asserts that research design has two basic purposes: (1) to provide answers to research questions, and (2) to control the variance.

A research design components and proposals should give an adequate attention to each appropriate and applicable design component.

### DEFINITION OF RESEARCH PLAN/DESIGN

Reduced to the simplest of terms, “research design is a mapping strategy. It is essentially a statement of the object of the inquiry and the strategies for collecting the evidences, analysing the evidences and reporting the findings.”

It should be made clear that the design components are in part mandatory and in part choices made by the researcher. Just as the object of the inquiry often determines the class of inquiry or model to be utilised, so too, does the model or class of inquiry determine the consideration and development of certain of the design components. In fact, it is essentially the variation in some of the design-components that differentiates among the classes of inquiry.

## DESIGN FORMAT FOR A RESEARCH PROPOSAL

### Title

- I. Problem Statement and its clarifying components.
  - (A) Statement of the problem.
  - (B) Clarification of the problem statement:
    1. Definitions.
    2. Delimitations.
    3. Assumptions.
    4. Theory base.
- II. Group Components for Operation
  - (A) Hypothesis/Question design.
  - (B) Sample population-sample or group at hand design:
    1. Population delineated, delimited and defined.
    2. Sample delineated, delimited and defined.
    3. Group at hand delineated, delimited and defined.
  - (C) Observation Design:
    1. Data (evidences) Collection
    2. Instrumentation:
      - (a) Questionnaire.
      - (b) Schedule.
      - (c) Sources
      - (d) Standard measures.
  - (D) Statistical Designs:
    1. Descriptive statistical design
    2. Inferential statistics for generalization design.
    3. Statistical randomization procedures for control design.
    4. Computer assistance design.
  - (E) Organizational Design.
- III. Significance and Review Sections:
  - (A) Significance of the objectives of the Inquiry.
  - (B) Review of the Related Literature and Research Reports.

The object is to test the relationships indicated in the hypotheses in such a manner that the researcher will be able to either accept or reject the hypotheses. To accomplish this a basic design must

be established which will (1) allow the researcher to control the different variables and (2) ensure that the controlled treatments are comparable.

## CHARACTERISTICS OF GOOD RESEARCH DESIGN

In a general sense we could answer the question (what makes for good research design)? With such statements as the design should be appropriate for the hypotheses or the design should be feasible within the limits of available resources. The following are the specific characteristics of a good research design:

1. It should be free from bias or learnings.
2. It should be free from confounding effect. A good research design eliminates confounding of variables or kept it to a minimum so the results can be interpreted separately. There should be a statistical precision. The hypotheses can be tested by employing most appropriate statistical technique.

There should be enough scope to impose the control over the situation. There are basically four ways by which control can be enhanced :

- (a) Through the method of Randomization.
- (b) Holding conditions or factors constant.
- (c) Building conditions or factors into the design as independent variables.
- (d) Statistical adjustment.

## POTENTIAL PROBLEMS IN RESEARCH DESIGN

There are several difficulties which make poor research design:

1. Inadequately stating and testing hypotheses.
2. Missing or unusable data.
3. Bias in sampling.
4. Inadequate measurement.
5. Lack of precision in statistical technique or inappropriate statistical devices.

## Research Methodology

Research methodology involves the systematic procedures by which the researcher starts from the initial identification of the problem to its final conclusions. The role of the methodology is to carry on the research work in a scientific, and valid manner. The method of research provides the tools and techniques by which the research problem is attacked. The methodology consists of procedures and techniques for conducting a study. Research procedures are of little value unless they are used properly. The tools and techniques will not get the work done. The proper use of research method must be learned by the researcher.

Research methodology involves such general activities as identifying problems, review of the literature, formulating hypotheses, procedure for testing hypotheses, measurement, data collection analysis of data, interpreting results and drawing conclusions. Thus, research methodology consists of all general and specific activities of research. Mastery of the research methodology invariably enhances understanding of the research activities. Thus, it seems that research design and methodology have the same meaning i.e. mapping strategy of research.

## SUITABILITY IN SHAPING METHODOLOGY OF EDUCATIONAL RESEARCH

Webster has defined methodology as “the science of method or arrangement” which is not a particularly useful definition. Method is defined as orderliness and regularly or habitual practice of them in action.“ By placing stress on ‘arrangement’, orderliness regularity and habitual practice. the methodologies derive their substance essentially from the classically ideal controlled experiment which permeates rightly or otherwise. in the literature of educational research. The methodology means with reference to research that it is a type of inquiry.

Suitability as a criterion for consideration of a type of inquiry is much like that of utility but suitability of educational research methodology requires two conditions:

- internal validity (control), and
- external validity (sampling).

Kish referred to internal validity as control and to external validity as representation of sample. Thus, internal validity (control) is the condition which permits blaming the independent information variable for the findings or being certain that the observation was produced by the information variable. External validity (sampling or representation) is a condition permitting the generalization or inference for the findings to the population from which the sample was drawn.

The Crucial Issue of Social Studies Research Design: It is difficult to design a research project that meets both of these conditions. The classical ideal controlled experiment is endowed with both of these attributes. However, in education the controlled experiment will tend to be strong on internal validity and less strong on representation (external validity). There is visually no claim to external validity in more control observation.

At this risk of over simplification, the investigation may be described as possessing less control concern than does the study and even less of a claim to external validity. The choice of this type of inquiry depends, in part, on the attainability of control and/or representation with a given research project and in part, on the relative need for control and/or representativeness.

The other type of inquiry is ‘action research’. Control or internal validity and representativeness or external validity are desirable conditions. However, ‘action research’ is an adhoc methodology and the conditions of control and/or representativeness are special applications. Thus, they are discussed as they are individually applied.

### Internal Validity

The world we know is composed of variables. A variable is described as a thing subject to change or fluctuation. Research is a process by which knowledge is either increased or clarified and progress is stimulated towards man’s need for problem solving. But problem solving and understanding derive from control or knowing the effect of a particular variable on other variables.

Internal Validity derives from the control of variables. Control variable or constant is frequently added to the set or substitution for the development variable. A most common set of variables consists of dependent, independent and intervening variables. The use of independent variable to describe the variable to be manipulated and dependent variable to describe the other part of the relationship is frequently erroneously applied to a given research inquiry.

Information variables: All the independent variables are information variables. An information variable is the treatment applied to a group of subjects to discern the effect it has on the group characteristic.

The information variable is the treatment applied to a group of subjects to discern the effect it has on the group under the conditions imposed. The experimental variable and control variable are information variables.

**Confounding Variable:** The intervening variables are confounding variables. A confounding variable is one which, if not controlled or held constant between groups, will cloud the certainty about the effect the information variable has on the group characteristics- the dependent variables identified as relevant confounding variables having to be controlled in the given inquiry. The dependent variable is the constant.

Relevant confounding variables may also lie the subjects. Sometimes these variables are overlooked because they are not apparent.

Internal validity is accomplished to some extent by selection or control of the relevant confounding variables. It is essentially a procedure of matching the subjects on the basis of the confounding variables.

Randomization is another procedure in the attempt to attain satisfactory or acceptable internal validity. It should be noted that statistical randomization does neither eliminate nor control the confounding variables.

### **External Validity**

External validity (sampling for representation) is the condition permitting the generalization or inference of the sample findings to the population from which the sample was selected.

Representation is a desirable condition in the experiment and especially demanding condition in the survey research.

As the likelihood of representation (external validity) increases through sampling procedures, the certainty of internal validity (control) decreases. Because findings derived from samples are subject to error, procedures such as sampling-error statistics are used for estimating the accuracy of the sampling-findings. A sampling error is the difference between the true measure of the population (parameters) and an estimate of that parameter which is the sample-finding or observed measure. The degree of external validity is reported as level of confidence at .01, .0, level of significance.

The .01 level means that if other samples were drawn from the same population, the likelihood of obtaining a comparable sample finding is 99 in 100 samples.

### **MEANING AND DEFINITION OF SAMPLING**

Sampling is indispensable technique of behavioural research, the research work cannot be undertaken without use of sampling. The study of the total population is not possible and it is also impracticable. The practical limitation: cost, time and other factors which are usually operative in the situation, stand in the way of studying the total population. The concept of sampling has been introduced with a view to making the research findings economical and accurate.

The research design is based on the sampling of the study. A good research design provides information concerning with the selection of the sample population treatments and controls to be imposed.

Generalizability of the research findings is, of course, dependent upon the sampling procedures followed. An ideally either a representative or random sample would be desirable to provide maximum information about the generalizability of research data.

### **W.G. Cochran defined the term sampling**

“In every branch of science we lack the resources, to study more than a fragment of the phenomena that might advance our knowledge.”

In this definition a ‘fragment’ is the sample and ‘phenomena’ is the ‘population’. The sample observations are applied to the phenomena i.e. generalization.

‘Sampling design’ in fact means the joint procedure of selection and estimation. Sampling should be such that error of estimation is minimum.

“In the social sciences, it is not possible to collect data from every respondent relevant to our study but only from some fractional part of the respondents. The process of selecting the fractional part is called sampling.”

– *David S. Fox*

Sampling is fundamental to all statistical methodology of behavioural and social research. Bad sampling vitiates the data at the source and no amount of subsequent statistical findings will improve its quality. In fact sampling is the part of the strategy of research and has by now acquired the status of technical job.

In physical sciences there is a no problem of sampling, any fragment or piece of a phenomena is the true representative, therefore, the generalization based on the sample is true. But in behavioural and social sciences sampling is the crucial problem to have a representative sample. Sampling means, selection of individuals from the population in such a way that every individual has the equal chance to be taken into the sample population.

Population or universe means, the entire mass of observations, which is the parent group from which a sample is to be formed. The sample observations provide only an estimate of the population characteristics.

The term ‘population’ or universe conveys a different meaning than a traditional one. In census survey, the count of individuals (men, women and children) is known as population. But in research methodology population means the characteristics of a specific group. For example, secondary teachers of Uttar Pradesh, who have some specific features (teaching experience, male and female, academic qualification, teaching attitudes, teaching aptitude etc.). Another example, high school students of Rajasthan who have some specific characteristics (age group), boys and girls personality, scholastic aptitude, academic motivation etc.). Thus, secondary teachers from one population and high students from another populations, they have different characteristics.

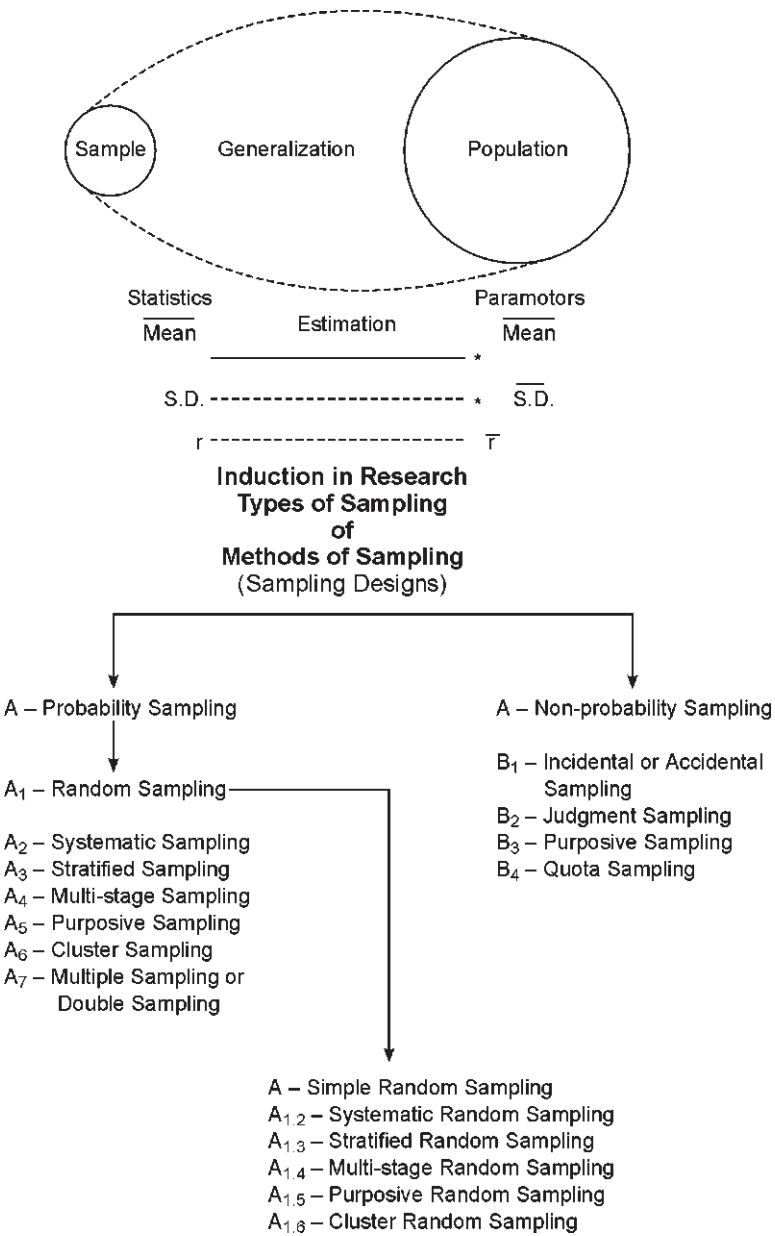
In selecting a sample subjects it is very essential that researcher should define his population and enumerate its characteristics.

## **FUNCTIONS OF POPULATION AND SAMPLING**

Research work is guided by inductive thinking. The researcher proceeds from specificity to generality. The sample observation is the specific situation, which are applied to the population, it is the general situation.

The sampling is the fundamental to all the statistical techniques and statistical analysis. The measures of a sample are known as statistics and measures of a population are termed as parameters. Mean, Standard deviation and Coefficient of Correlation of sample observations are known statistics and Mean S.D. and Coefficient of Correlation of a population are called parameters. Generally parameters are estimated on the basis of sample statistics. The accuracy of the parameters depends on sample

representativeness or statistics. In research work generalization is made by estimating parameters on the basis of sample statistics.



## RANDOMIZATION

Randomization is a method of sampling in which each individual of the population has the equal chance or probability of selection of the individuals for constituting a sample. The choice of one individual is in no way tied with other. The individuals of a sample are independently drawn from the population. All members of the population have essentially the same probability of being selected. The following are the main characteristics of randomization:

1. Each individual of the population has equal chance of being picked up into the sample.
2. One individual does not effect in selection of the other. There is no tie with one another.
3. It is free from subjective factor or personal error or bias and prejudices or imagination of the investigator.
4. It ensures that the sample formed by this method. may be representative of the population.

### Methods of Randomization

The following are main methods of randomization:

- (a) Lottery method of randomization.
- (b) Tossing a coin (Head or tail) method.
- (c) Throwing a dice.
- (d) Blind folded method.
- (e) Random tables (Tiptt's Table of Randomization).

The randomization can be done by employing either of the methods for selecting sample subjects from the population. Generally random tables are used for constituting a sample in educational research.

### Advantages of Randomization

The following are the major advantages of randomization:

1. It is an objective method of sampling.
2. It is an economical method from money, energy point of view.
3. It is a convenient approach of sampling in the field of research.
4. It permits the application of statistical devices and treatments of data. The error due sampling can be estimated.
5. It maintains the accuracy in the analysis of results.
6. It is a practical method of sampling.
7. A representative sampling may be selected by using randomization.

### Limitation of Randomization

The following are the main limitations of this method :

Randomization does not ensure the representativeness of population. A random sample may be good representative or may not be. There is no guarantee for representativeness of the population by the method.

If randomization is not done rigorously, it may allow for personal areas or subjectivity.

Actual randomization involves some practical operations, if the situations are not favourable the process of randomization might be effected.



The method of randomization can not be used effectively in educational research, because principles, heads can not permit to select subjects randomly from a class or an institution. Thus, selected subject may not co-operate.

## TYPES OF SAMPLING DESIGNS

Several methods have been devised to select representative samples. In general two types of techniques of sampling are as follows:

1. **Probability Sampling:** Method of sampling which gives the probability that our sample is representative of population is known as probability sampling.
2. **G.C. Halmstadter:** A Probability sample is one that has been selected in such a way that every element chosen has a known probability of being included. Generally probability sampling is used in Fundamental Research (F.R.) since in F.R. our purpose is to generalize the results.

There are two laws of probability sampling:

(1) Law of Statistical Regularity, and (2) Law of Inertia of Large Sample.

1. **Law of Statistical Regularity:** This law involves the probability principle. A small sample may be good representative of the population, if the subjects of sample are selected at random. The conclusions drawn from the sample may be generalized for the population. The sample 'statistics' are the estimates of the population parameters. The parametric test of significance can be used for this purpose.
2. **Law of Inertia of the Large Sample:** It is the corollary of the first law. A large sample is more stable or good representative as compared with small sample. The sample error is inversely in proportion to the size of sample. It can be shown with the help of the following formula:

$$SE_M = \frac{\sigma}{\sqrt{N}}$$

If N size of the sample increases the sampling error or standard error the mean decrease. If it tends to infinity, the sampling error will be zero.

$$SE_M = \frac{\sigma}{\sqrt{\alpha}} = 0$$

Therefore, parametric tests are used for inferential purpose.

2. **Non-probability Sampling:** If there is no such idea of probability then the method of sampling is known as non- probability sampling. Non-probability sampling is generally used in Action Research (A.A.), since in A.R. we study a class without any generalization purpose.

## Characteristics of Probability Sampling

The following are the main characteristics of probability sampling:

1. In probability sampling we refer from the sample as well as the population.
2. In probability sampling every individual of the population has equal probability to be taken into the sample.
3. Probability sample may be representative of the population.

4. The observations (data) of the probability sample are used for the inferential purpose.
5. Probability sample has not from distribution for any variable.
6. Inferential or parametric statistics are used for probability sample.
7. There is a risk for drawing conclusions from probability sample.
8. The probability is comprehensive. Representativeness refers to characteristic.  
Comprehensiveness refers to size and area.

Characteristics of Non-probability Sampling: The following are the main characteristics of non-probability sample:

1. There is no idea of population in non-probability sampling.
2. There is no probability of selecting any individual.
3. Non-probability sample has free distribution.
4. The observations of non-probability sample are not used for generalization purpose.
5. Non-parametric or non-inferential statistics are used in non probability sample.
6. There is no risk for drawing conclusions from non-probability sample.

**1. Types or Techniques Probability Sampling:** There are a number of techniques of taking probability sample. But here only six important techniques have been discussed as follows:

1. Simple random sampling.
2. Systematic sampling.
3. Stratified sampling.
4. Multiple or Double sampling.
5. Multi-stage sampling.
6. Cluster sampling.

**2. Types of Non-probability Sample:** There are the following four types of non-probability sample:

- (1) Incidental or accidental sample.
- (2) Purposive sample.
- (3) Quota sample.
- (4) Judgement sample.

## PROBABILITY SAMPLING

### 1. Simple Random Sampling

A simple random sample is one in which each element of the population has an equal and independent chance of being included in the sample i.e. a sample selected by randomization method is known as simple-random sample and this technique is simple random-sampling. Aandomization is a method and is done by using a number of techniques as :

- (a) Tossing a coin.
- (b) Throwing a dice.
- (c) Lottery method.
- (d) Blind folded method.
- (e) By using random table of 'Tippett's Table'.

**Advantages**

- (a) It requires a minimum knowledge of population.
- (b) It is free from subjectivity and free from personal error.
- (c) It provides appropriate data for our purpose.
- (d) The observations of the sample can be used for inferential purpose.

**Disadvantages**

- (a) The representativeness of a sample cannot be ensured by this method.
- (b) This method does not use the knowledge about the population.
- (c) The inferential accuracy of the finding depends upon the size of the sample.

**2. Systematic Sampling**

Systematic sampling is an improvement over the simple random sampling. This method requires the complete information about the population. There should be a list of informations of all the individuals of the population in any systematic way. Now we decide the size of the sample.

Let sample size =  $n$   
and population size =  $N$

Now we select each  $N/n$ th individual from the list and thus we have the desired size of sample which is known as systematic sample. Thus for this technique of sampling population should be arranged in any systematic way.

**Advantages**

- (a) This is a simple method of selecting a sample.
- (b) It reduces the field cost.
- (c) Inferential statistics may be used.
- (d) Sample may be comprehensive and representative of population.
- (e) Observations of the sample may be used for drawing conclusions and generalizations.

**Disadvantages**

- (a) This is not free from error, since there is subjectivity due to different ways of systematic list by different individuals. Knowledge of population is essential.
- (b) Information of each individual is essential.
- (c) This method can't ensure the representativeness.
- (d) There is a risk in drawing conclusions from the observations of the sample.

**3. Stratified Sampling**

It is an improvement over the earlier method. When employing this technique, the researcher divides his population in strata on the basis of some characteristics and from each of these smaller homogeneous groups (strata) draws at random a predetermined number of units. Researcher should choose that characteristic or criterion which seems to be more relevant in his research work.

Stratified sampling may be of three types:

1. Disproportionate stratified sampling.
2. Proportionate stratified sampling.
3. Optimum allocation stratified sampling.

1. Disproportionate sampling means that the size of the sample in each unit is not proportionate to the size of the unit but depends upon considerations involving personal judgement and convenience. This method of sampling is more effective for comparing strata which have different error possibilities. It is less efficient for determining population characteristics.
2. Proportionate sampling refers to the selection from each sampling unit of a sample that is proportionate to the size of the unit. Advantages of this procedure include representativeness with respect to variables used as the basis of classifying categories and increased chances of being able to make comparisons between strata. Lack of information on proportion of the population in each category and faulty classification may be listed as disadvantages of this method.
3. Optimum allocation stratified sampling is representative as well as comprehensive than other stratified samples. It refers to selecting units from each stratum should be in proportion to the corresponding stratum the population. Thus sample obtained is known as optimum allocation stratified sample.

These three types are clear from the table as given below:

<i>Levels</i>	<i>Disproportionate Str. Sampling</i>	<i>Proportionate str. Sampling</i>	<i>Optimum allocation stratified Sampling</i>	
			<i>Population</i>	<i>Sample</i>
H.G.	35	25	250	25
A. G.	43	50	400	40
L. G.	22	25	350	35
Sample	100	100	1000	100

#### **Advantages**

- (a) It is (more precisely third way) a good representative of the population.
- (b) It is an improvement over the earlier.
- (c) It is an objective method of sampling.
- (d) Observations can be used for inferential purpose.

#### **Disadvantages**

- (a) Serious disadvantage of this method is that it is difficult for the researcher to decide the relevant criterion for stratification.
- (b) Only one criterion can be used for stratification, but it generally seems more than one criterion relevant for stratification.
- (c) It is costly and time consuming method.
- (d) Selected sample may be representative with reference to the used criterion but not for the other.
- (e) There is a risk in generalization.

#### **4. Multiple or Double or Repetitive Sampling**

Generally this is not a new method but only a new application of the samplings we discussed above. This is most frequently used for establishing the reliability of a sample. When employing a mailed

questionnaire, double sampling is sometimes used to obtain a 'more representative sample. This is done because some randomly selected subjects who are sent questionnaires may not return them. Obviously, the missing data will bias the result of the study, if the people who fail to reply the' query differ in some fundamental way from the others in respect to the phenomena being studied. To eliminate this bias, a second sample may be drawn at random from the non-respondents and the people interviewed to obtain the desired information. Thus this technique is also known as repeated or multiple sampling. This double sampling technique enables one to check on the reliability of the information obtained from the first sample. Thus, double sampling, wherein one sample is analysed, and information obtained is used to draw the next sample to examine the problem further.

**Advantages**

- (a) This sampling procedure leads to the inferences of free determine precision based on a number of observations.
- (b) This technique of sampling reduces the error.
- (c) This method maintains the procedure of the finding evaluate the reliability of the sample.

**Disadvantages**

- (a) This technique of sampling cannot be used for a large sample. It is applicable only for small sample.
- (b) This technique is time consuming, costly, and requires more competition.
- (c) Its planning and administration is more complicated.

**5. Multi-Stage Sampling**

This sample is more comprehensive and representative of the population. In this type of sampling primary sample units are inclusive groups and secondary units are sub-groups within these ultimate units to be selected which belong to one and only one group. Stages of a population are usually available within a group or population, whenever stratification is done by the researcher. The Individuals are selected from different stages for constituting the multi-stage sampling.

**Advantages**

- (a) It is a good representative of the population.
- (b) Multi-stage sampling is an improvement over the earlier methods.
- (c) It is an objective procedure of sampling.
- (d) The observations from multi-stage sample may be used for inferential purpose.

**Disadvantages**

- (a) It is a difficult and complex method of samplings.
- (b) It involves errors when we consider the primary and secondary stages.
- (c) It is again a subjective phenomenon.

**6. Cluster Sampling**

To select the intact group as a whole is known as a Cluster sampling. In Cluster sampling the sample units contain groups of elements (clusters) instead of individual members or items in the population. Rather than listing all elementary school children in a given city and randomly selecting 15 per cent of these students for the sample, a researcher lists all of the elementary schools in the city, selects at random 15 per cent of these clusters of units, and uses all of the children in the selected schools as the sample.

**Advantages**

- (a) It may be a good representative of the population.
- (b) It is an easy method.
- (c) It is an economical method.
- (d) It is practicable and highly applicable in education.
- (e) Observations can be used for inferential purpose.

**Disadvantages**

- (a) Cluster sampling is not free from error.
- (b) It is not comprehensive.

All these above are techniques of probability sampling.

**7. Non-probability Sampling Techniques**

Non-probability is also known as non-parametric sampling which are used for certain purpose.

**1. Incidental or Accidental Assignment**

The term incidental or accidental applied to those samples that are taken because they are most frequently available, i.e. this refers to groups which are used as samples of a population because they are readily available or because the researcher is unable to employ more acceptable sampling methods.

**Advantages**

- (a) It is very easy method of sampling.
- (b) It is frequently used in behavioural sciences.
- (c) It reduces the time, money and energy i.e. it is an economical method.

**Disadvantages**

- (a) It is not a representative of the population.
- (b) It is not free from error.
- (c) Parametric statistics cannot be used.

**2. Judgement Sampling**

This involves the selection of a group from the population on the basis of available information thought. It is to be representative of the total population. Or the selection of a group by intuition on the basis of criterion deemed to be self-evident. Generally investigator should take the judgement sample so this sampling is highly risky.

**Advantages**

- (a) Knowledge of the investigator can be best used in this technique of sampling.
- (b) This technique of sampling is also economical.

**Disadvantages**

- (a) This technique is objective.
- (b) It is not free from error.
- (c) It includes uncontrolled variation.

- (d) Inferential statistics cannot be used for the observations of this sampling, so generalization is not possible.

### **3. Purposive Sampling**

The purposive sampling is selected by some arbitrary method because it is known to be representative of the total population, or it is known that it will produce well matched groups. The Idea is to pick out the sample in relation to some criterion, which are considered important for the particular study. This method is appropriate when the study places special emphasis upon the control of certain specific variables.

#### ***Advantages***

- (a) Use of the best available knowledge concerning the sample subjects.
- (b) Better control of significant variables.
- (c) Sample groups data can be easily matched.
- (d) Homogeneity of subjects used in the sample.

#### ***Disadvantages***

- (a) Reliability of the criterion is questionable.
- (b) Knowledge of population is essential.
- (c) Errors in classifying sampling subjects.
- (d) Inability to utilise the inferential parametric statistics.
- (e) Inability to make generalization concerning total population.

### **4. Quota Sampling**

This combined both judgement sampling and probability sampling. The population is classified into several categories: on the basis of judgement or assumption or the previous knowledge, the proportion of population falling into each category is decided. Thereafter a quota of cases to be drawn is fixed and the observer is allowed to sample as he likes. Quota sampling is very arbitrary and likely to figure in Municipal surveys.

#### ***Advantages***

- (a) It is an improvement over the judgement sampling.
- (b) It is an easy sampling technique.
- (c) It is most frequently used in social surveys.

#### ***Disadvantages***

- (a) It is not a representative sample.
- (b) It is not free from error.
- (c) It has the influence of regional geographical and social factors.

Since research design is a plan by which research samples may be selected from a population and under which experimental treatments are administered and controlled so that their effect upon the sample may be measured. Therefore, a second step in the establishment of an experimental design is to select the treatments that will be used to control sources of learning change in the sample subjects.

## CHARACTERISTICS OF A GOOD SAMPLE

The following are the main characteristics of a good sample:

1. A good sample is the true representative of the population corresponding to its properties. The population is known as aggregate of certain properties and sample is called sub-aggregate of the universe.
2. A good sample is free from bias, the sample does not permit prejudices the learning and pre-conception, imaginations of the investigator to influence its choice.
3. A good sample is an objective one, it refers objectivity in selecting procedure or absence of subjective elements from the situation.
4. A good sample maintains accuracy. It yields an accurate estimates or statistics and does not involve errors.
5. A good sample is comprehensive in nature. This feature of a sample is closely linked with true-representativeness. Comprehensiveness is a quality of a sample which is controlled by specific purpose of the investigation. A sample may be comprehensive in traits but may not be a good representative of the population.
6. A good sample is also economical from energy, time and money point of view.
7. The subjects of good sample are easily approachable. The research tools can be administered on them and data can be collected easily.
8. The size of good sample is such that it yields an accurate results. The probability of error can be estimated.
9. A good sample makes the research work more feasible.
10. A good sample has the practicability for research situation.

### Advantages of Sampling Technique according to R.A. Fisher

Fisher has enumerated the following four advantages of sampling technique:

1. It has a greater adaptability.
2. It is an economical technique.
3. It has high speed for generalization.
4. It has a greater precision and accuracy in the observation.

Advantages of Sampling Technique according to W.G. Cochran. He has given the following four advantages of sampling technique:

1. This technique has great accuracy.
2. It has a greater speed in conducting a research work.
3. It has a greater scope in the field of research.
4. It reduces the cost of observation or data collection.

### Types of Errors in Sampling

The samples of behavioural research are not representative and suffer from two types of errors:

- (1) Random error, and (2) Systematic error.

These errors can be classified further as :

- (a) Sampling errors and (b) Error of measurement.



Thus, it provides a four-ways classification and has been shown in following manner:

	Random	Constant
Sampling measurement	A	B
	C	D

Cell A refers to the unavoidable errors that occur whenever sampling is done. The sample selected at random may be high, low or average with regard to the trait measured. This error can be minimized by selecting a large sample.

Cell B refers to errors of bias in sampling, i.e. sampling errors which do not cancel out, but rather lean systematically in one or the other direction of the population value. This error is due to any decision of researcher for selecting subjects for the sample. The systematic error exists, the data are of limited use as the basis for generalizing to the population. Thus, Cells A and B refer to the errors and sampling.

Cells C and D refer to errors. In the process of measurement, rather than to errors in sampling. The errors in Cell C which occur from the simple fact measurement derived from any instrument of less than complete reliability are inevitable in some degree of error. The error of measurement is cancelled out by selecting a large sample. Sum of errors of measurement is always zero.

Cell D concerns with another bias-that is due to systematic errors of measurement. If, in the testing of subjects for intelligence, the test administrator allows an extra three minutes for the test, there will be probably be systematic tendency for the sample statistics to be higher than the population parameters.

The systematic errors are the bad errors in both in sampling and in measurement. The magnitude of random sampling errors as they affect the sample statistics as given below:

$$SE_M = \frac{\sigma}{\sqrt{N}}$$

If greater accuracy is required, it can be obtained by increasing the size of sample or the homogeneity of the variable under-investigation or by using adequate sampling design.

If the results obtained are systematically higher or lower than the corresponding true value, the sample is biased and the discrepancy is called an error of bias.

**Size of Sample**

One of the first questions that the researcher typically asks, concerns with the number of subjects that need to be included in his sample. Technically, the size of the sample depends upon the precision the researcher desires in estimating the population parameter at a particular confidence level. There is no single rule that can be used to determine sample size.

The best answer to the question of size is to use as large a sample as possible. A larger sample is much more likely to be representative of the population. Furthermore with a large sample the data are likely to be more accurate and precise. It was pointed out in that the larger the sample, the smaller the standard error. In general, the standard error of a sample mean is inversely proportional to the square root of *n*. Thus, in order to double the precision of one’s estimation, the sample size would need to be quadrupled.

It is often suggested that one should include at least 30 subjects in a sample since this number permits the use of large sample statistics. Statistically speaking, a sample  $n = 30$  is considered large, since with this  $n$ , the t-distribution and the normal curve are practically the same for hypothesis testing purposes. In experimental research, one should select a sample that will permit at least 30 in each group. Descriptive research typically uses larger samples; it is sometimes suggested that one should select 10-20 per cent of the accessible population for the sample.

**Determine the Size of Sample:** It is the crucial problem for the research scholars to determine the size of sample. In an experimental study, it is essential to equate the control and experimental groups, but in survey study sample should be representative of population. Therefore, size of sample is an important aspect for the representativeness. Mouly has suggested a statistical criterion for determining the size of the sample.

Other things being equal, the larger the sample, the greater the precision and accuracy of the data it provides. It is a common belief that the precision of data is determined primarily by the size of the sample, rather than by the percentage of the population represented in the sample. The term 'large sample' is vague, it varies with nature of study. The exact procedure by which to determine the sample size required varies with the nature of the variable and its sampling distribution, but the basic procedure can be illustrated in connection with the mean of random samples based on normal probability distribution. The chances are 95 to 5 that a sample in separated sampling will fall within the interval  $M \pm 1.96 SE_M$ .

The next question is the degree of accuracy required. Generally 95 to 99 per cent confidence intervals are acceptable i.e. 5 to 1 per cent error. If the variable of the study is the intelligence and the sampling errors were kept within 5 per cent at the 95 per cent confidence level. The investigator can use the formula for the standard error of the mean to provide the required size of sample.

$$1.96 SE_M = 5,$$

$$1.96 \frac{\sigma}{\sqrt{n}} = 5$$

Where

$\sigma$  = S.D. of the population

$n$  = Size of the sample

5 is percent of sampling error

In this illustration I.Q. distribution  $s = 16$

$$\sqrt{n} = 1.96 \times \frac{16}{5} = 9.30$$

$$n = 96$$

If the investigator wants more precise, the sampling error is kept within 1 per cent at the 99 per cent confidence level. The following formula is used for determining the size of sample:

$$2.58 SE_M = 1 ; 2.58 \frac{\sigma}{\sqrt{n}} = 1$$

$$2.58 \times 16 = \sqrt{n} \sqrt{n} = 41.28$$

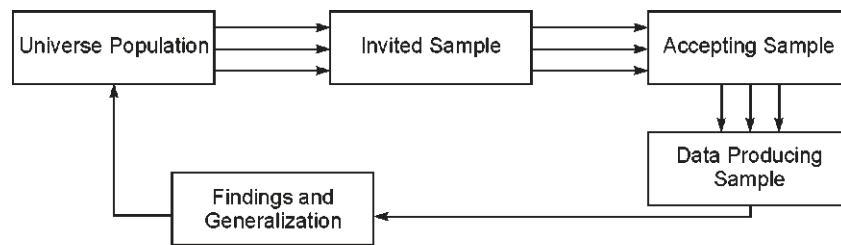
$$n = 16$$

Thus, he would need a sample of 96 case in order to meet the conditions of 5 per cent error at 95 per cent confidence level. He would require a sample 1681 case for 1 per cent error at the 99 per cent confidence level.

Generally in behavioural research more than one variable are taken into a study. In such situation he should consider standard deviations of the distributions of the variables. The highest S.D. is to be considered for calculating the size of the sample. In this way a researcher can determine the exact size of sample indicating the sampling error in per cent. He should not use an arbitrary criterion for determining the size of his sample.

**THE SAMPLING CYCLE**

Five stages of sampling cycle are proposed here, as sketched in figure. In this cycle, the researcher identifies the universe that is relevant for his research problem and then identifies his population, that is, that portion of the universe to which he has access. Then by applying the techniques for sample selection, he decides how large a sample he needs, selects, and invites that number to participate. To this point, the researcher has completed control over the process, but at this point the respondents assume most of the control. For now, some do and others do not accept the invitation, and so typically more invitations are extended until sufficient number accept so that the sample is of desired size. Those who do accept form the accepting sample then the researcher applied his data gathering technique to the accepting sample depending upon factors like the data gathering design, methods and techniques, all or only some of the accepting sample actually produce data. Those who do form the data producing sample, it is from these data that the researcher obtains his findings and makes his conclusions.



The Sample Cycle

**REPRESENTATIVES**

Completing the sample cycle by applying findings and generalization to the population and universe makes sense in one set of circumstances only, when the various samples can be considered representative of the population and universe. But as the Sample Cycle is intended to illustrate and emphasize, representativeness is a securing concern throughout the sample process. When we identify the universe of relevance for our respondents and research problem and select the population, we face the first representative question can the population be considered representative of the universe? If it can move on to identify and select the invited sample, and from this derive the accepting sample. At this stage there is second concern with representativeness of the accepting sample to the population.

When the data gathering instrument one administered and the researcher learns what kind of attribution has taken place in terms of the data producing sample which has emerged. he must face the

critical issue of determining if he can consider the data producing sample representative of the accepting sample and therefore of the population but we are using ambiguous concept at the heart of this discussion “representative”. We want every stage to be representative of proceeding stage but representative in terms of age, shoe, size, sex, voting record, we could extend a list of possible human characteristics and attributes endlessly. We want representativeness in terms of these variables that are known to be related to the phenomenon under study.

## IDENTIFYING A REPRESENTATIVE SAMPLE

The representative issue comes to the four first in the identification of the population within the universe. For every research problem there is one completely relevant universe, but any number of population. For example, for a study concerned with the relative teaching ability of liberal arts graduates and school of education graduates, the obvious universe of relevance is all liberal arts and education graduates functioning as a teacher who graduates two year prior to the date at which the study will collect its data. But clearly no researcher will have access to this universe.

Next step in the sampling cycle is the identification of the invited sample at this stage we can seek to guarantee that the invited sample is representative of the population on selected characteristics. In doing so we must consider two different aspects of representativeness: (1) assuring that all significant aspects of a characteristics are represented in the sample, and (2) assuring that each aspect is of the same proportion of the sample as it is of the population.

Assuring that all significant aspects of a characteristic are represented in the sample is achieved through a process called stratification. This involves in dividing the population into sub-groups or strata on the basis of the characteristics for which we seek representativeness and creating our sample by separate selections for each stratum.

In summary, it might be repeated that there is no best sampling design. Validity of sample data, like validity of all data, is a specific concept to be evaluated from the standpoint of the specific case. It is, therefore, difficult to generalize. Nevertheless, it is generally true that the aspect of sampling to which investigators of educational problems might most profitably devote their attention is minimizing possible bias rather than devising complicated design.

## RELIABILITY OF SAMPLING

There are three ways of deciding the reliability of sample:

### 1. By Selecting Another Parallel Sample

Results analysis for sub-sample and compare with main sample. This process establishes the reliability of the sample.

### 2. Statistical Technique

Reliability of the statistics also indicates the reliability of sample this can be estimated by using statistical method: method is standard error of mean-The means of randomly selected samples, which are normally distributed, have their own standard deviation, known as the standard deviation, or standard error, of the mean. The standard error of the mean of a sample is computed from the formula:

$$\sigma_M = \frac{\sigma}{\sqrt{N}}$$

where  $\sigma_M$  = Standard error of mean  
 $\sigma$  = Standard deviation of the population  
 $N$  = Size of the sample.

The standard error of the sample means that it has a smaller value than the standard deviation of the individual scores. This is understandable because in computing the means of Sample, extreme scores are not represented by the means which are middle scores values:

From the formula  $\sigma_M = \frac{\sigma}{\sqrt{N}}$ , it is apparent that as the size of the sample  $N$  approaches infinity, the mean approaches the population mean and the standard error of mean approaches zero.

$$\sigma_M = \sigma_M = \frac{\sigma}{\sqrt{N}} = 0$$

As  $N$  is reduced in size and approaches one, the standard error of the mean approaches the value of the standard deviation of the population scores.

$$\sigma_M = \frac{\sigma}{\sqrt{1}} = \sigma$$

This analysis suggests that other factors being equal statistical inferences based upon small samples have larger margins of error than those based upon larger samples. Thus, the distribution of sample means is similar to the distribution of population,  $n$  scores except the range of sample means and their standard deviation are smaller in value.

The value of the true mean of an infinite population is not known, for it can not be calculated. One might say that it is "known only to God:". But a particular mean calculated from a randomly selected sample can be related to the population mean in the following way:

Approximately 68 per cent of the sample means will lie within a range of  $\pm \sigma_M$  of the population mean. 95 per cent of samples means will lie within  $\pm 1.96 \sigma_M$  of the population mean.

99 per cent of sample means will lie within  $\pm 2.58 \sigma_M$  of the population mean.

The mean of the samples means will approximate the population mean.

## **APPLICATION OF SAMPLING TECHNIQUE IN VARIOUS TYPES OF RESEARCH HISTORICAL RESEARCH**

In historical research the problem of sampling is not so important because historical research is based upon past records, events and facts but in Case Study-Method judgement sample and purposive sample is used because the purpose of case study method is to improve the case and not to conclude therefore non "probability sampling is applied.

## **NORMATIVE SURVEY METHOD**

In this method random sampling is frequently used because in normative survey large sample is selected-systematic, multi stage and multiple sampling can also be used in normative survey method.

## EXPERIMENTAL METHOD

In experimental method most precise and comprehensive method of sampling is preferred. Therefore, stratified sampling technique is used but in educational situation it is often difficult to use this stratified sampling than cluster sampling technique is preferred.

In the field of education research cluster sampling techniques is most frequently used and it has some limitations but it has usability in teaching learning situations and educational research.

### EXERCISES

1. What do you mean by research design? Differentiate between research methodology and research design. Illustrate your answer with suitable example.
2. Enumerate the characteristics of good research design and indicate potential problems in preparing a research design.
3. Define the term 'Sampling'. Differentiate between sample and population and illustrate your answer with examples.
4. Distinguish between probability sampling and non-probability sampling. Mention the assumptions of a probability sampling.
5. What do you mean by the term 'Randomization'? Indicate the methods of randomization and their advantages and limitations.

## Chapter 6

# Survey Method

Research has threefold objectives: Theoretical, factual and application. These objectives are achieved by employing different methods and strategies of research. A research scholar should know the meaning of the term method and strategy of research.

### MEANING AND DEFINITION OF METHOD

Method is a style of conducting a research work which is determined by the nature of the problem. M. Verma has defined the term method in the following manner -

“Method is only in the abstract as logical entities that we can distinguish between matter and methods, in reality, they form an organic whole and matter determines method analogously as objective determines means and content and spirit determine style and form in literature.”

M. Verma has presented broad meaning of the term method. According to him matter is important for determining method. The common types of matter may be three types, hence all the methods can be classified under three heads

1. Theoretical problem – survey, experimental method.
2. Factual problem – Historical, case study and genetic methods.
3. Application problem – Action Research.

Broudy (1963) stated that “Method refers to the formal structure of the sequence of acts commonly denoted by instruction. The term method covers both strategy and tactics of teaching and involves the choice of what is to be taught, and the order in which it is to be taught.”

Method is more general, it includes techniques also. The research techniques are ways of implementing a method. Different techniques may be employed within the same method.

Webster defined methodology as “the science of method or arrangement” which is not a particularly useful definition. Method is defined as “orderliness and regularity or habitual practice of them in action”. By placing stress on “arrangement”, orderliness, regularity and habitual practice, the methodologies derive their substance essentially from the classically ideal controlled experiments which permeates rightly or otherwise, the literature of educational research. The methodology means with reference to research that it is a type of inquiry.

### Definition of Strategy

The term research strategy has been defined in the following manner –

“Research strategy is a generalized plan for a problem which includes structure, desired solution in terms objectives of research and an outline of planned devices necessary to implement the strategy. The research strategy is a part of a larger development scheme of research’ approach.”

The term 'strategy' has been borrowed from military science. It refers to the objectives of research. The objectives of research work determine the strategy. A generalized plan for realizing the objective is known as research strategy. The research strategy is based on the objective of research, while research method is based on the nature of the research problem. The same method of research may be called as research strategy, if it is determined by considering the objective of research. In the recent literature research strategy is now being used.

## THE SCIENTIFIC METHOD

The scientific method is a general set of procedures or steps through which the systematic approach is developed. The scientific method and systematic approach are synonymous. It is a more specific research process. A series of steps are used in the scientific method of research–

The initial step of the scientific method that of observing some phenomenon represents an insight into some experience. The need to resolve the problem is felt and the individual prepares to do something about the need.

The second step is to Identify the problem more precisely. It involves the formulation of hypotheses based on observed phenomenon.

The third step of the scientific method is to develop and apply a design for the solution of the problem and testing the hypotheses.

The fourth step usually identified is a continuation of the third step - that continued testing hypotheses. Results are subjected to further analyses and tests.

The final step is that of drawing conclusions based on data and“ tests and integrating these conclusions with the existing body of knowledge.

### Assumptions of Scientific Method

The following are the main assumptions of this method :

1. It is assumed that we are living in a real world i.e. there exists an objective reality, independent of whether or not. It has been discovered.
2. The assumption of the uniformity of nature is that what has been found to be true will continue to be true and that similarity of circumstances will produce consistently similar results. The assumption relates to the three postulates:
  - (a) Natural kinds, (b) Constancy, and (c) Determination.
  - (a) The postulate of natural kinds is the principle that natural phenomena can be classified according to common characteristics. We can classify student behaviour or performance e.g. divisions and grading system.
  - (b) The postulate of constancy assumes that In nature there is a certain degree of consistency. The performances of students under certain conditions are expected to be the same as they have been in the past, given the same conditions.
  - (c) The postulate of determination assumes that within the orderliness of nature, the occurrence of a phenomenon is preceded by certain antecedent events or conditions.



## The Use of Scientific Method

The use of scientific method rests upon these assumptions and postulates. It is used for studying the cause-effect relationship two or more variables. It establishes the functional relationship among variables.

## TYPES OF RESEARCH METHODS

George J. Mouly has classified research methods into three basic types: Survey, historical and experimental methods. The meanings and their further classification have been given in the following paras:

### 1. Survey Method

It is concerned with the present and attempts to determine the status of the phenomena under investigation.

This method has been further classified into four categories:

(a) Descriptive (b) Analytical (c) School survey and (d) Genetic.

(a) Descriptive survey is of four types:

- a<sub>1</sub>–Survey testing method,
- a<sub>2</sub>–Questionnaire survey method,
- a<sub>3</sub>–Interview survey method.

(b) Analytical survey is of five types:

- b<sub>1</sub>–Documentary frequency,
- b<sub>2</sub>–Observational survey,
- b<sub>3</sub>–Rating survey,
- b<sub>4</sub>–Critical incident,
- b<sub>5</sub>–Factor analysis.

(c) School survey and

(d) Genetic survey.

### 2. Historical Method

This method is concerned with the past and which attempts to trace the past as a means for seeing the present prospective.

The historical method can be classified into three types:

(a) Historical, (b) Legal, and (c) Documentary.

### 3. Experimental Method

It is oriented towards the discovery of basic relationship among phenomena as means of predicting and eventually, controlling their occurrence.

The experimental method has been further classified into four types as given below:

- (a) Simple experimental designs,
- (b) Multio-variate analysis,

- (c) Case study, and
- (d) Predictive or correlation.

### Another way of Classification of Methods

The purpose of research work is to examine the phenomena.

It can be studied by employing either of research approach. There are two approaches of research:

1. **Longitudinal Approach:** Which is concerned with complete information of the phenomena from its genesis upto its fruit. This is the time sense approach.

This approach employs three methods of research

- (a) Historical method,
- (b) Genetic method, and
- (c) Case study method.

2. **Cross-sectional Approach:** Which is concerned with the information of any aspect of the phenomena in the existing situation.

This approach employs the following three methods

- (a) Survey method,
- (b) Experimental method, and
- (c) Casual comparative method or Ex-post facts method.

### NORMATIVE SURVEY METHOD

The word 'survey' has been derived from the words 'sur' or 'sor' and 'veeir' or 'veior' which means 'over' and 'see' respectively. Normative survey deals with "what is"? Its scope is very vast. It describes and interprets what exists at present. In a normative survey we are concerned with conditions or relationships that exist, practices that prevail, beliefs, points of view or attitudes that are held, processes that are going on, influences that are being felt, and trends that are developing.

Writers have used various terms like 'Normative', 'descriptive', 'survey', 'status' or 'trend' to describe such type of investigations.

### PURPOSE AND USES OF SURVEY METHOD

The following are the main purposes and uses of survey methods of research:

Although the major purpose of survey method in research is to tell "what is"? i.e., to describe the problem or phenomenon, but many surveys go beyond a mere description of the existing situation. For example, the survey dealing with curriculum courses help us in obtaining information not only about the strength and weaknesses of the current curriculum but also can elicit recommendations for change.

Descriptive surveys, or normative surveys are often carried out as preliminary step to be followed by researcher employing more vigorous control and more objective methods.

Descriptive surveys or studies also serve as direct sources of valuable knowledge concerning human behaviour.

Descriptive studies are helpful for us in planning various educational programmes, school census, in perhaps, the most universal application of the descriptive method to educational planning, school surveys are conducted to help, solve the problems of various aspects of school i.e. school plants, school maintenance, teaching staff, curriculum, teaching methods, learning objectives and the like.

### 3. Informations which the Survey Methods Collect

The survey methods of survey studies collect the following three types of informations

The informations are:

- (i) of what exists,
- (ii) of what we want, and
- (iii) of how to get there.

The information of what exists is gathered by studying and analyzing important aspects of present situation.

The information of what we want, is obtained by clarifying goods, goals, and objectives possibly through a study of the conditions existing else where or what experts consider to be desirable.

The Information of how to get these are collected through discovering the possible means of achieving the goals on the basis of the experiences of others or of opinions of experts.

### 4. Characteristics of the Survey Method

The following are the main characteristics of the survey method of research:

1. The survey method gathers data from a relatively large number of cases at a particular time.
2. It is essentially cross-sectional.
3. It is not concerned with the characteristics of individuals.
4. It involves clearly defined problem.
5. It requires experts imaginative planning.
6. It Involves definite objectives.
7. It requires careful analysis and interpretation of the data gathered.
8. It requires logical and skilful reporting of the findings.
9. Surveys vary greatly in complexity.
10. It does not seek to develop an organised body of scientific principles.
11. It provides information 'useful to the solution of local problems.
12. It contributes to the advancement of knowledge because affords penetrating insight into the nature of what one is dealing with.
13. It suggests the course of future developments.
14. It determines the present trends and solves current problems.
15. It helps in fashioning many tools with which we do the research.

### TYPES OF SURVEY STUDIES

There are three criteria for classifying the survey research:

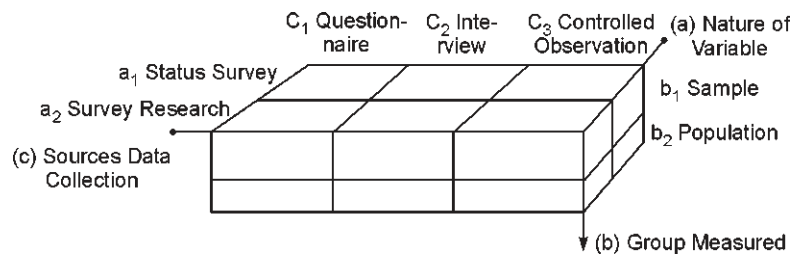
- (a) Nature of variables
  - a<sub>1</sub> – Status survey
  - a<sub>2</sub> – Survey research
- (b) Group Measured
  - b<sub>1</sub> – Sample
  - b<sub>2</sub> – Population

## (c) Sources of data collection

- c<sub>1</sub> – Questionnaire
- c<sub>2</sub> – Interview
- c<sub>3</sub> – Controlled observations survey.

This classification of survey studies can be shown with the help of three dimensional  $2 \times 2 \times 3$  diagram.

Survey research as defined by Kerlinger deals with the incidence, distribution and interrelation of sociological and psychological variables.



Some important types of survey researches have been described in the following paras:

## DESCRIPTIVE STUDIES

No category of educational research is more widely used than the type known variously as the survey, the normative surveyor descriptive research.

Descriptive research is concerned with the present and attempts to determine the status of the phenomenon under investigation.

### The Nature of Descriptive Research

The nature of descriptive research can be explained with reference to other type of research.

#### (a) Descriptive and Historical Research (Longitudinal or cross sectionals)

A clear distinction can be drawn between survey studies and historical studies on the basis of time, the latter deals with past, the former with present.

#### (b) Descriptive and Experimental Research

Descriptive research as are oriented toward the determination of the status of a given phenomenon rather than toward the isolation of causative factors accounting for its existence.

It is based on cross-sectional samples, the sample should be representative of the population. Descriptive research involves large sample and experimental research includes small sample. Descriptive research investigates trend of characteristics of population. This is less scientific and sophisticated.

#### (c) Descriptive and Case Study

Both types of research establish cause and effect of relationship.

### Purpose of Descriptive Research

The following are the main objectives of descriptive research:

1. To identify present conditions and point to present needs.
2. To study immediate status of a phenomenon.
3. Facts findings.
4. To examine the relationships of traits and characteristics (trends and patterns).

The descriptive survey is more realistic than experimental research. Descriptive researches are oriented towards the descriptive of the present status of a given phenomenon.

### Special Problems of Descriptive Research

1. The problem of sampling, to select representative sample (size of the sample).
2. The validity of the measuring instruments. Validity of the tool is crucial to the validity of the findings of study.

### Types of Descriptive Research

- (a) Survey Testing,
- (b) The questionnaire, and
- (c) Interview.

**Survey Testing:** Survey testing researches are concerned with academic and psychological problems in which academic and psychological tests are administered for data collection. This type of research includes following types of problems:

(a) **Selection of tests**, because number of meaning instruments have been developed for measuring same trait or variable. The problem which of them should be taken up for data collection. For this purpose following considerations would be kept in view:

1. How the test defines the variable and the investigator should also define the variable in the same way.
2. Validity of the tool.
3. Ease for administration, scoring and interpretation.

(b) **Construction of Tests**. It may be possible that appropriate tool is not available for measuring the same variable. Hence, the researcher has to construct the tool. He has to estimate reliability and validity of the tool, it is not essential that norm should be developed. He has to follow the standard steps.

(c) The major difficulty is the applicability of the test norm to the particular group under study. Because every test has limitations that it can be used for some specific population.

**Use of Survey Testing Results:** Survey testing, as a research activity, usually is interested in evaluating the achievement of a class, a school, relationship of variables, educational and vocational guidance and standardization of test. Researches. of these types reveal the weakness of scholar's programme. It can be used evolving the criterion of admission and selection. These researches can be used as policy discussions.

**Characteristics of Survey Testing Research:** The following are major characteristics:

1. Descriptive-survey-test research are relatively more scientific and accurate.
2. It provides more accurate data.
3. The data are subjected to parametric treatments.
4. The sample is usually of large size the error of measurement and sampling error is put to the minimum.
5. The findings are authentic and accurate.
6. The conclusions are realistic.
7. It provides the deep insight to the psychometric methods of test construction.

**(a) Achievement Testing:** Survey testing of educational attainment has become a large and well established part of school surveys. Achievements test of objective type are constructed for this purpose. Such achievements testing surveys may serve in any purposes:

1. They may enable the researchers to compare the performance of the present pupils with those of previous years or of different schools.
2. They may be taken as suggestive if not a very reliable evidence, of the quality of teaching.
3. They may be used as one of the means of rating different educational institutions.
4. They may form a part of large complex studies of other types than survey e.g. in experimental and complex casual studies.
5. The principal or teachers may use the results of city or of state wide survey testing for a critical analogies their own school or classes.

**(b) Intelligence Testing:** Although it is used to a much less extent than the achievement tests in school surveys, yet intelligence tests are a very important tool for educational researches. The many purposes for which survey intelligence testing has been used are:

1. For dividing large classes into relatively homogeneous sections.
2. An diagnosing and adjusting individual children in educational and vocational guidance.
3. For studying the socially or educationally mal-adjusted children.
4. For estimating the aptitude i.e. for prognosis.
5. For scientific study and experimentation.
6. For ascertaining the intellectual level of pupils who enter the college. who succeed in the school but do not enter the college and who do not succeed in school.
7. For constructing and adopting the various intelligence tests.

**(c) The Personality Testing:** Though difficult to define analyze and measure they still have given rise to some instruments for survey testing in the field of personality, character and adjustment which embrace a wide variety of techniques. Questionnaires, interviews, observations, check-lists and rating scale as also some carefully pre-arranged social situations are frequently employed in addition to written tests.

Personality testing includes: school appraisal studies:

### **School Appraisal**

“Appraisal is a form of classification or scaling according to subjective values.”

– C.V. Good

It is an attempt to measure not the objective characteristics of a school, but the effect of those characteristics on human beings. Appraisal of different aspects of a school is an essential element in school survey. It is concerned with both the objective aspects of an educational institutions including its administrative provisions and practices and the educational attainments of its pupils. In other words, it takes account of both static and functional data or of conditions and outcomes. To achieve this aim besides attainment tests, a school case render a community and perhaps to compare these services with those that are provided by other schools. The ultimate aim of all school surveys in educational progress which they achieve by focussing attention on unfulfilled needs or unrecognized evils of a school system on the one hand and on worthwhile practices on the other.

Being a large and varied scope of school survey a single comprehensive school survey may be contributed of various parts or constituent surveys. The following are some such important parts of school surveys.

1. Survey testing:
  - (a) Achievement Testing.
  - (b) Intelligence Testing.
  - (c) Personality Testing.
2. School Appraisal.
3. Status Study.
4. Financial Study.
5. Curriculum Study.
6. Building Study.

Now, we will discuss these parts which are important for school surveys.

#### **1. Questionnaire Survey**

This type of descriptive research uses the questionnaire as research tool for data collection. It is most frequently used in this type of research. Researches of this type are employed for school and educational survey and also for educational administration. Though this type of research is considered the easy yet the investigator has to face the following problem:

##### ***Problems of Questionnaire Survey***

1. The first problem is faced in planning a questionnaire and its development.
2. Another problem is to get adequate answer or information through questionnaire. Return of questionnaire is always doubtful.
3. The reliability and validity of the data through questionnaire is doubtful.
4. Sometimes it is difficult to analyse the data. Only descriptive statistics can be used in this type of data.
5. Selection of large and representative sample.

### ***Advantages of the Questionnaire Survey***

The following are the main advantages of questionnaire survey research:

1. Among the major advantages of the questionnaire is that it permits wide coverage at a minimum expense of both money and effort. It affords wider geographical coverage it makes for greater validity in the results through promoting the selection of a large and more representative sample.
2. The validity of questionnaire data also depends in a crucial way on the validity and willingness of the respondent to provide the information requested. Research has shown that respondents are as a group of superior intelligence.

**Disadvantages:** The major disadvantages of the questionnaire are the possibility of the misinterpretation of the questions. Misinterpretations are due to the respondent's willingness or impersonality. Mailed questionnaire are usually impersonal. The reliability of the questionnaire is often ignored.

## **2. The School Surveys**

A school survey generally is a comprehensive study of existing educational conditions undertaken to determine the overall effectiveness of the school programme with a view toward improvement where indicated. In a sense it is a form of accounting or inventory. It gathers information about various aspects of the school programme and evaluates them in the light of objectives of the school. It can be restricted to one specific element or one specific department but in general it is most useful when it is designed to accomplish the school programme. Comprehensive type of school surveys cover the following aspects:

1. Aims, outcomes, pupil achievement, curriculum, method and instructional aids.
2. Administrative problems and procedures.
3. Financial policies and procedures.
4. Operation and maintenance of the physical plant and related factors.
5. Pupil transposition, and
6. Staff and personals.

**(I) Behaviour Studies:** Centred round measuring such traits and self-reliance, initiative, spontaneity, judgement, cooperation, adaptability, etc. which form no mean goals of education.

**(II) Attitude Studies:** Centred round the attitudes of the pupils, parents or teachers towards courses of study, activities in or out of school, professions and problems, they may encounter.

Check lists, rating scales, or scores cards, the researcher must make use of other lines of evidences such as reputation, and subsequent success of the pupils.

The school appraisal surveys utilize in one instance or another the whole range of normative survey procedures including the following:

1. Analysis of available basic data.
2. Score card and rating scale.
3. Standard tests.
4. Case study.
5. Experimental procedure.
6. Interview or questionnaire.
7. Observation.



The school survey includes the following steps:

1. Preparation of plans.
2. Preparation of adequate tools.
3. Gathering data.
4. Interpretation of data and conclusions.
5. Preparing report.

In the adequate tools the following are mainly used :

1. Questionnaire.
2. Tests.
3. Rating scales, and
4. Score cards.

**(III) Curriculum Studies:** As a part of school survey, the object may be merely to analyse the existing curriculum in a school system and perhaps to compare it with that existing elsewhere. But if it is carried on as an independent study, it may take a more complicated shape. It may include or analyze the principles on which the curriculum is based, the needs it fulfils, the form it has taken and the shortcomings it suffers from. The relation to the community, it serves, may also be determined.

**(IV) Building Surveys:** The survey of school buildings for the purpose of planning or evaluation or just for the sake of information, is not common feature. It usually forms parts of comprehensive or wider school surveys. The questionnaire, check list, score cards, observation are the usual tools for collecting data about buildings, their right, and location, the accommodation they provide, the arrangement they have for various classes, subjects activities or staffs, the conditions they are in as regards the construction and cleanliness and the improvement or the whole procedure is however purposive, not mechanical application of steps and techniques.

**(V) Status Studies:** To determine the status including personal and professional characteristics of various school officials and teachers may be a part of a school study or the subject for the independent study. The questionnaires are the main means employed by the investigators for such type of study. Officials records are also utilized for the purpose. The problem of the selection placement of the teachers, their teaching load, their status with regard to tenure, health, law supply and demand, etc., all form the subjects of such a study.

**(VI) Financial Study:** The financial position of a school forms an important aspect of school studies. To ascertain the sources of finance, the items of expenditure, the deficit or indebtedness, expenditure per pupil, and teachers salaries, etc., are the main aspects for the financial study of a school. For this purpose the questionnaires are generally used. The financial study of a school helps to a great extent, in the status study expansions they stand in need of these studies too may be independent and complete in themselves or comparative of part of wider school surveys. Building surveys commonly deal with the background and setting of schools, an estimate of future school, and available financial resources for school buildings.

### 3. Documentary Frequency Studies

A definitely quantitative type of normative research documentary frequency studies are undertaken to identify and count certain characteristics found in documents under consideration. They deal with a systematic examination of currents, records documents, etc. and may merely gather and classify data from such documents or may also evaluate the content according to some established criteria.

A study of this type involves the problems of following types:

1. Problem of ascertaining the purpose of the study.
2. Problems of determining what characteristics to count and to define them.
3. Problems of selecting documentary specimens for investigation.

The documentary studies may serve the following purposes:

- (a) They may describe prevailing practices or conditions.
- (b) They may discover the relative importance or interest in certain topics or problems.
- (c) They may discover levels of difficulty of presentation in text books or other publications.
- (d) They may evaluate element of bias or propaganda in text book presentation.
- (e) They may analyze types of errors in standard's work.

The sources of data for documentary studies may be:

1. Official reports and records,
2. Printed forms, text-books, and reference books,
3. Letters, autobiographies, and diaries,
4. Compositions, themes, or other prepared works,
5. Books, magazines, newspapers,
6. College bulletins, Catalogues, syllabi, and
7. Pictures and cartoons, etc.

**Types of Documentary Studies:** The following are the main types of documentary studies:

1. Text book analysis,
2. Analysis of longer bodies of literature,
3. Curriculum analysis,
4. Job analysis, and
5. Analysis of assembled specimens:
  - (a) Vocabulary analysis,
  - (b) Error studies, and
  - (c) Analysis of characteristics of school records and reports.

#### 4. Survey Appraisal Studies

Appraisal studies of certain aspects of existing educational phenomena like schools, students, teachers, text-books, etc. are also of the normative survey type, survey appraisal studies learn more heavily upon the human element than surveys of other type; especially because appraisal is itself an attempt to determine the effect of characteristics upon human beings.

The studies that involve the direct judgement commonly use the jury technique whereby the judgement of a number of persons with regard to certain persons, features or specimens is pooled to secure a final verdict. Check lists attitude scales, scaled specimens, rating scales, score cards and index numbers are the tools commonly used for the purpose of appraisal. These appraisal instruments are based on two fundamental assumptions:

(i) One assumption is that better judgement can be secured on the significant aspects of an object or situation by focussing attention on one aspect at a time.

The other assumption is that a general value can be approximated by assumption of the value of the parts.

In so far as both these assumptions are open to doubt and criticism these instruments of appraisal fail in being perfect. Yet they are not without their use.

“After all appraisal schedules are normative instruments, they reflect general tendencies, tempered by the superior and by the inferior, but they represent in the main, thinking we are most used to.”

– C.V. Good

## 5. Follow-up Studies

The follow-up studies form another type of normative survey investigations which study individuals who have left an institution after a course of study or programme of work. They concern themselves with engagements, occupations, or status of the individuals, subsequent of their study and the impact of their previous institution and programme upon them. They examine the status of those who have passed out of an institution or seek their opinions directly as to the value of the courses, experiences or treatments received at the institution.

The follow-up study may serve the main purposes given below:

1. They may prove the adequacy or otherwise of the institution's programme of work.
2. They may lead to the improvement of the curriculum, syllabus, methods of teaching, administrative procedures. guidance and service. etc.
3. They may provide the valuable information on the process of selection or recruitment of the candidates for a course.
4. They may evaluate the influence of certain psychological, social educational factors found among youngsters on their after life.

The various tools used singly or in combination in follow-up studies are:

- (a) Questionnaires, (b) Check Lists (c) Rating scales,
- (d) Attitudes Scales (e) Score cards (f) Interview and
- (g) Observation.

### EXERCISES

1. Define the term 'method'. Differentiate between method of research and strategy of research.
2. Distinguish between methods of research and methodology of research. Illustrate your answer with examples.
3. Classify the methods of research. Give various ways of classifying methods of research. Differentiate between longitudinal and cross-sectional approach to educational research and illustrate your answer with examples.
4. What do you mean by survey method of research? Distinguish between Descriptive Survey and Analytical Survey method of research.
5. Mention the purpose and uses of survey method of research in Education.
6. “There are three criteria for classifying the survey research: Nature of Variable, Group Measured and Sources of Data.” Illustrate this statement.