***SAMPLING***

**Sample and Population:**

A sample in a research study is the group on which information is obtained. The larger group to which one
hopes to apply the results is called the population.\* All 700 (or whatever total number of) students at State University who are majoring in mathematics, for example, constitute a population; 50 of those students constitute
a sample.

**Characteristics of a Good Sample Design:**

* The characteristics of a good sample design can be listed down as under:
* Sample design must result in a truly representative sample.
* Sample design must be such which results in a small sampling error. (c) Sample design must be viable in the context of funds available for the research study.
* Sample design must be such so that systematic bias can be controlled in a better way.
* Sample should be such that the results of the sample study can be applied, in general, for the universe with a reasonable level of confidence.

**Types of Sampling Designs:**

**1. Probability sampling:**

Probability sampling is also known as ‘random sampling’ or ‘chance
sampling’. Under this sampling design, every item of the universe has an equal chance of inclusion in
the sample. It is, so to say, a lottery method in which individual units are picked up from the whole
group not deliberately but by some mechanical process. Here it is blind chance alone that determines
whether one item or the other is selected. The results obtained from probability or random sampling
can be assured in terms of probability i.e., we can measure the errors of estimation or the significance
of results obtained from a random sample, and this fact brings out the superiority of random sampling
design over the deliberate sampling design. Random sampling ensures the law of Statistical Regularity
which states that if on an average the sample chosen is a random one, the sample will have the same
composition and characteristics as the universe. This is the reason why random sampling is considered
as the best technique of selecting a representative sample.

**Advantages:**

* This sampling technique reduces the chance of systematic errors.
* The methods minimize the chance of sampling biases.
* A better representative sample is produced using probability sampling techniques.
* Inferences drawn from sample are generalizable to the population.

**Disadvantages:**

* The techniques need a lot of efforts.
* A lot of time is consumed.
* They are expensive.

**2. Non-probability sampling:**

Non-probability sampling is that sampling procedure which does
not afford any basis for estimating the probability that each item in the population has of being
included in the sample. Non-probability sampling is also known by different names such as deliberate
sampling, purposive sampling and judgement sampling. In this type of sampling, items for the sample
are selected deliberately by the researcher; his choice concerning the items remains supreme. In
other words, under non-probability sampling the organisers of the inquiry purposively choose the
particular units of the universe for constituting a sample on the basis that the small mass that they so
select out of a huge one will be typical or representative of the whole. For instance, if economic
conditions of people living in a state are to be studied, a few towns and villages may be purposively
selected for intensive study on the principle that they can be representative of the entire state. Thus,
the judgement of the organisers of the study plays an important part in this sampling design.

**Advantages:**

* The techniques need less effort.
* These techniques need less time to finish up.
* They are not much costly.

 **Disadvantages:**

* The sampling techniques are prone to encounter with *systematic errors* and
*sampling biases.*
* The sample cannot be claimed to be a good representative of the population.
* Inferences drawn from sample are not *generalisable* to the population.

**Probability Samples:**

1. **Simple random sampling**

In simple random sampling, each member of the population under study has an equal chance of being selected and the probability of a member of the population being selected is unaffected by the selection of other members of the population, i.e. each selection is entirely independent of the next. The method involves selecting at random from a list of the population (a sampling frame) the required number of subjects for the sample.

1. **Systematic sampling**

This method is a modified form of simple random sampling. It involves selecting subjects from a population
list in a systematic rather than a random fashion. For example, if from a population of, say, 2,000 a sample of 100 is required, then every twentieth person can be selected. The starting point for the selection is chosen at random. One can decide how frequently to make systematic sampling by a simple statistic – the total number of the wider population being represented divided by the sample size required.

1. **Random stratified sampling**

Random stratified sampling involves dividing the population into homogeneous groups, each group containing
subjects with similar characteristics, and then randomly sampling within those groups. For example, group A might contain males and group B, females. In order to obtain a sample representative of the whole population in terms of sex, a random selection of subjects from group A and group B must be taken. If needed, the exact proportion of males to females in the whole population can be reflected in the sample.

1. **Cluster sampling**

When the population is large and widely dispersed, gathering a simple random sample poses administrative problems. Suppose we want to survey students’ fitness levels in a particularly large community or across a country. It would be completely impractical to select students randomly and spend an inordinate amount of time travelling about in order to test them. By cluster sampling, the researcher can select a specific number of schools and test all the students in those selected schools, i.e. a geographically close cluster is sampled. One has to be careful to ensure that cluster sampling does not build in bias. For example, let us imagine that we take a cluster sample of a city in an area of heavy industry or great poverty; this may not represent all kinds of cities or socio-economic groups, i.e. there may be similarities within the sample that do not catch the variability of the wider population. The issue here is one of representativeness; hence it might be safer to take several clusters and to sample lightly within each cluster, rather than to take fewer clusters and sample heavily within each.

1. **Stage sampling**

Stage sampling is an extension of cluster sampling. It involves selecting the sample in stages, that is, taking samples from samples. For example, one type of stage sampling might be to select a number of schools at random, and from within each of these schools, select a number of classes at random, and from within those classes select a number of students.

1. **Multi-phase sampling**

In stage sampling there is a single unifying purpose throughout the sampling. In the previous example the purpose was to reach a particular group of students from a particular region. However, in a multi-phase sample the purposes change at each phase, for example, at phase one the selection of the sample might be based on the criterion of geography (e.g. students living in a particular region); phase two might be based on an economic criterion (e.g. schools whose budgets are administered in markedly different ways); phase three might be based on a political criterion (e.g. schools whose students are drawn from areas with a tradition of support for a particular political party), and so on. Here the sample population changes at each phase of the research.

**Non-Probability Samples:**

1. **Convenience sampling**

Convenience sampling, or, as it is sometimes called, accidental or opportunity sampling, involves choosing
the nearest individuals to serve as respondents and continuing that process until the required sample size has been obtained of those who happen to be available and accessible at the time. Captive audiences such as students or student teachers often serve as respondents based on convenience sampling. The researcher simply chooses the sample from those to whom she has easy access. As it does not represent any group apart from itself, it does not seek to generalize to the wider population; for a convenience sample, that is an irrelevance.

1. **Quota sampling**

Quota sampling has been described as the nonprobability equivalent of stratifid sampling (Bailey, 1994). Like a stratifid sample, a quota sample strives to represent signifiant characteristics (strata) of the wider population and sets out to represent these in the proportions in which they can be found in the wider population. For example, suppose that the wider population comprised 55 per cent females and 45 per cent males, then the sample would have to contain 55 per cent females and 45 per cent males; if the population of a school contained 80 per cent of students up to and including the age of sixteen, and 20 per cent of students aged seventeen and over, then the sample would have to contain 80 per cent of students up to the age of sixteen and 20 per cent of students aged seventeen and above.

1. **Purposive sampling**

In purposive sampling, often (but by no means exclusively) a feature of qualitative research, researchers
handpick the cases to be included in the sample on the basis of their judgment of their typicality or possession of the particular characteristic(s) being sought. They assemble the sample to meet their specific needs. Purposive sampling is undertaken for several kinds of research (Teddlie and Yu, 2007), including: to achieve representativeness, to enable comparisons to be made, to focus on specific, unique issues or cases, to generate theory through the gradual accumulation of data from different sources.

1. **Dimensional sampling**

One way of reducing the problem of sample size in quota sampling is to opt for dimensional sampling. Dimensional sampling, a refinement of quota sampling, involves identifying various factors of interest in a population and obtaining at least one respondent of every combination of those factors. Thus, in a study of racism, for example, researchers may wish to distinguish fist-, second- and third-generation immigrants. Their sampling plan might take the form of a multi-dimensional table with ‘ethnic group’ across the top and ‘generation’ down the side. A second example might be of a researcher who may be interested in studying disaffected students, girls and secondary-aged students and who may find a single disaffected secondary female student, i.e. a respondent who is the bearer of all of the characteristics sought.

1. **Snowball sampling**

In snowball sampling researchers identify a small number of individuals who have the characteristics in
which they are interested. These people are then used as informants to identify, or put the researchers in touch with, others who qualify for inclusion; these, in turn, identify yet others – hence the term snowball sampling (also known as ‘chain-referral methods’). This method is useful for sampling a population where access is difficult, maybe because the topic for research (and hence the sample) is sensitive (e.g. teenage solvent abusers; issues of sexuality; criminal gangs), or where participants might be suspicious of researchers, or where contact is difficult, for example, those without telephones, the homeless (Heckathorn, 2002). As Faugier and Sargeant (1997), Browne (2005) and Morrison (2006) argue, the more sensitive the research, the more difficulty there is in sampling and gaining access to a sample.

1. **Volunteer sampling**

In cases where access is difficult, the researcher may have to rely on volunteers, for example, personal friends, or friends of friends, or participants who reply to a newspaper advertisement, or those who happen to be interested from a particular school, or those attending courses. Sometimes this is inevitable (Morrison, 2006) as it is the only kind of sampling that is possible, and it may be better to have this kind of sampling than no research at all.