CONCEPT OF POPULATION AND SAMPLE -CHARACTERISTICS OF GOOD SAMPLE

The researcher is concerned with the generalizability of the data beyond the sample. For studying any problem it is impossible to study the entire population. It is therefore convenient to pick out a sample out of the universe proposed to be covered by the study. The process of sampling makes it possible to draw valid inferences or generalizations on the basis of careful observation of variables within a small proportion of the population.

Quantitative researchers generally do not gather data from the entire population—it's rarely necessary and even more rarely feasible, especially if the population of interest is large or geographically scattered. If a sample is well selected, the results of a study testing that sample should be generalizable to the population. That is, the results of the research will be applicable to other samples selected from the same population. For example, you might study a randomly selected group of 500 students attending a university in order to make generalizations about the entire student body of that university.

Several relatively simple sampling techniques can be applied to select what is known as a representative sample. These procedures do not guarantee that the sample will be perfectly representative of the population, but they definitely increase the odds. By following the procedures for defining a population, selecting a random sample, determining sample size, avoiding sampling error and bias, and selecting a nonrandom sample, described in the sections that follow, the investigator in this example should feel confident that his results reflect those of his population of students.

DEFINING A POPULATION

The first step in sampling is to define the population to which results will be generalizable. The small group that is observed is called a sample, and the larger group about which the generalization is made is called a population. A **population** is defined as all members of any well-defined class of people, events, or objects. a distinction is made between the population to which the researcher would ideally like to generalize study results, the target population, and the population from which the researcher can realistically select subjects, which is known as the accessible population or available population. A **sample** is a portion of a population.

In most studies, the chosen population is generally a realistic choice (i.e., the accessible population), not an ideal one (i.e., the target population). By selecting from a more narrowly defined population, a researcher saves time and money but also loses the ability to generalize about the target population.

A description of the sample you ultimately choose should include the number of participants and demographic information about the sample (e.g., average number of years teaching, percentage of each gender or racial group, level of education, achievement level). The type of demographic information reported depends on the sample; the information used to describe a sample of teachers is different from that used to describe a sample of students, parents, or administrators.

RATIONALE OF SAMPLING

Inductive reasoning is an essential part of the scientific approach. The inductive method involves making observations and then drawing conclusions from these observations. If you can observe all instances of a population, you can, with confidence, base conclusions about the population on these observations (perfect induction). Researcher could be confident that he/she had the true means, standard deviations, and so forth (the parameters). However, if you observe only some instances of a population, then you can do no more than infer that these observations will be true of the population as a whole (imperfect induction). This is the concept of sampling, which involves taking a portion of the population, making observations on this smaller group, and then generalizing the findings to the parent population-the larger population from which the sample was drawn.

Sampling is indispensable to the researcher. Usually, the time, money, and effort involved do not permit a researcher to study all possible members of a population. Furthermore, it is generally not necessary to study all possible cases to understand the phenomenon under consideration. Sampling comes to your aid by enabling you to study a portion of the population rather than the entire population.

Because the purpose of drawing a sample from a population is to obtain information concerning that population, it is extremely important that the individuals included in a sample constitute a representative cross section of individuals in the population. Samples must be representative if you are to be able to generalize with reasonable confidence from the sample to the population. For example, the researcher may assume that the students MPC Autonomous College are representative of Indian adolescents. However, this sample may not be representative if the individuals who are included have some characteristics that differ from the target population. The location of their school, their socioeconomic backgrounds, their family situations, their prior experiences, and many other characteristics of this group may make them unrepresentative of Indian adolescents.

An unrepresentative sample is termed a **biased sample.** The findings on a biased sample in a research study cannot legitimately be generalized to the population from which it is taken. For example, if the population of interest is all students in a particular urban school district but the researchers sampled only students from any two schools of district, the sample would be biased.

CHARACTERISTICS OF GOOD SAMPLE

An ideal sample must be representative of the population corresponding to its properties. It should not lack in any characteristic of the population.

- It must be unbiased and must be obtained by a probability processor random method.
- It must make the research work more feasible and has the practicability for the research situation.
- It must yield an accurate result and does not involve errors. The probability of error can be estimated.
- Sample must be adequate to ensure reliability. A sample having 10% of the whole population is generally adequate.

- The sample must be comprehensive. It is a quality of sample which is controlled by the specific purpose of the investigation.
- Sample units must be chosen systematically and objectively.

ADVANTAGES OF SAMPLING

a. **Economical**- Manageable sample will reduce the cost compare to entire population.
b. **Increased speed**- The process of research like collection of data, analysis and Interpretation of data etc take less time than the population.
c. **Greater Scope**- Handling data becomes easier and manageable in case of a sample. Moreover comprehensive scope and flexibility exists in the case of a sample.
d. **Accuracy**- Due to limited area of coverage, completeness and accuracy is possible. The processing of data is done accurately producing authentic results.
e. **Rapport**- Better rapport is established with the respondents, which helps in validity and reliability of the results.

DISADVANTAGES OF SAMPLING

a. **Biasness**- Chances of biased selection leading to erroneous conclusions may prevail. Bias in the sample may be due to faulty method of selection of individuals or the nature of phenomenon itself.
b. **Selection of true representative sample-** It the problem under study is of a complex nature, it becomes difficult to select a true representative sample, otherwise results will not be accurate & will be usable.
c. **Need for specialized knowledge**- The researcher needs knowledge, training and experience in sampling technique, statistical analysis and calculation of probable error. Lack of those may lead to serious mistakes.
d. **Changeability of units**- If the units of population are not homogeneous, the sampling technique will be unscientific. At times, all the individuals may not be accessible or may be uncooperative. In such a case, they have o be replaced. This introduces a change in the subjects to be studied.
e. **Impossibility of sampling**- Sometimes population is too small or too heterogeneous to select a representative sample. In such cases 'census study' is the alternative (Information about each member of the population) Sampling error also comes because of expectation of high standard of accuracy.

Suggested Reading

Ary, D., Jacobs, L. C., Sorensen, C., and Razavieh, A. (2010), Introduction to Research in Education, Wadsworth Cengage Learning, Canada.

Best, J. W. and Kahn, J. V. (1995), Research in Education, Prentice Hall, New Delhi.

Cohen, L., Manison, L., and Morrison, K. (2018), Research Methods in Education, Routledge, London and New York.

Creswell, J. W. (2012), Educational Research Planning, Conducting, and Evaluating Quantitative and Qualitative Research, Pearson, New York.

Gay, L. R., Mills, G.E., and Airasian, P. W. (2012), Educational Research Competencies for Analysis and Application, Pearson, New York.

Kerlinger, Fred. N. (1978), Foundations of Behavioral Research, New York University.

Kothari, R.C. (2004), Research Methodology, New Delhi, New Age International (P) Limited, Publishers.

Langenbach, M., Vaughn, C., and Aagaard, L. (1993), An Introduction to Educational Research, Allyn and Bacon, Boston.