

Unit – III
M.Com (SEM-II)
Research Methodology (CMRC4204)

My dear students, presently we are going through a very critical situation. Due to sudden artificial COVID-19 attack, thousands of people have lost their valuable lives and many infected people around the world are fighting against death and thus the situation is very severe. All the nations are jointly working against COVID-19 to save the human civilization. The COVID-19 shock has not only pushed the human life in danger but also the entire economy in the world has headed down in front of COVID-19. But, we are united and we must win the fight. During this pandemic situation the normal life of every human being has been hampered and in danger. So, my urge to you to stay at home and keep yourselves safe and maintain social distancing and obey the Govt. order.

Don't be panic; you are the future of our nation. So, spend your valuable time with listening music, cooking foods, reading books, playing indoor games like Chess, carom etc. with your family. Stay away from social media because misinformation is circulating day and night which is baseless and it is also very difficult to judge which is correct and which is not.

Thus, I have sent you the study material of UNIT-III which would be helpful at this moment.

1. What is sampling?

Sampling may be defined as the selection of some part of an aggregate or totality on the basis of which a judgment or inference about the aggregate or totality is made or in other words, it is the process of obtaining information about an entire population by examining only a part of it.

2. What is the need for sampling?

Sampling is used in practice for a variety of reasons such as:

- i. Sampling can save money and time. A sample study is less expensive than a census study and produces result at a faster speed as compare to census.
- ii. Sampling may enable more accurate measurements for a sample study is generally conducted by trained and experienced investigators.
- iii. Sampling remains the only way when population contains infinitely many members.
- iv. Sampling remains the only choice when a test involves the destruction of the item under study
- v. Sampling usually enables to estimate the sampling errors and thus, assists in obtaining information concerning some characteristics of the population.

3. Fundamentals definitions of sample survey?

A sample survey is a method for collection data from or about members of population so that inferences about the entire population can be obtained from a subset, or sample, of the population.

4. What is sampling theory?

Sampling theory is a study of relationships existing between a population and samples drawn from the population. Sampling and it is applicable only to random samples. It is designed to attain the following objectives:

- i. Sampling theory helps in estimating unknown population parameters from knowledge of statistical measures based on sample studies.
- ii. It enables us to decide whether to accept or reject hypothesis.

iii. Sampling theory helps in making generalization about the population/universe from the studies on samples drawn from it.

5. Define Census?

A complete enumeration of all items in the population is known as a census inquiry. It can be presumed that in such an inquiry, when all items are covered, no element of chance is left and highest accuracy is obtained.

6. Define sample design?

A sample design is a definite/exact plan for obtaining a sample from a given population. It refers to the technique or the procedure the researcher would adopt in selecting items for the sample and it is determined before data are collected.

7. What are the steps/processes of sample design?

The following steps are kept into mind when sample is designed:

- i. **Type of Universe:** this is the first step in developing any sample design is to clearly define that set of objects, technically called the universe, to be studied. It may be finite or infinite.
- ii. **Sampling unit:** A decision has to be taken concerning a sample unit before selecting sample. It may be a geographical one such as district, village, state etc., or a social unit such as family, club, school, university etc., or it may be an individual.
- iii. **Source list:** It is also known as sampling frame from which sample is to be drawn. It contains the names of all items of a universe. If source list is not available, researcher has to prepare it and it should be comprehensive, correct, reliable and appropriate.
- iv. **Size of the sample:** This refers to the number of items to be selected from the universe to constitute a sample and it is a major problem before a researcher. The size of sample should neither be excessively large, nor too small. It should be optimum. An optimum sample is one which fulfills the requirements of efficiency, representativeness, reliability and flexibility. While deciding the size of sample, researcher must determine the desired precision as also an acceptable confidence level for the estimate.
- v. **Parameters to interest:** In determining the sample design, one must consider the question of the specific population parameters which are of interest. For example, we may be interested in estimating the proportion of persons with some characteristics in the population or we may be interested in knowing some average or the other measure concerning the population.
- vi. **Budgetary constraint:** Cost considerations, from practical point of view, have a major impact upon decisions relating to not only the size of the sample but also to the type of sample. This fact can even lead to the use of a non-probability sample.
- vii. **Sampling procedure:** Finally, the researcher must decide the type of sample he will use i.e., he must decide about the technique to be used in selecting the items for the sample. In fact, this technique or procedure stands for the sample design itself. There are several sample designs out of which the researcher must choose one which is important for his study.

8. Discuss the criteria of selecting a sample procedure?

In this context one must remember that two costs are involved in a sampling analysis viz., the cost of collecting the data and the cost of an incorrect inference resulting from the data. A researcher must keep in view the two causes of incorrect inferences viz., systematic bias and sampling error. The following criterion must take into consideration while selecting a sample design as under:

- i. **Inappropriate sampling frame:** If the sampling frame is inappropriate i.e., a biased representation of the universe, it will result in a systematic bias.
- ii. **Defective measuring device:** If the measuring device is constantly in error, it will result in systematic bias. In survey work, systematic bias can result if the questionnaire or the interview is biased. If the physical measuring device is defective there will be systematic bias in the data collected through such a measuring device.

iii. Non-respondents: If we are unable to sample all the individuals initially included in the sample, there may arise a systematic bias. The reason is that in such a situation the likelihood of establishing contact or receiving a response from an individual is often correlated with the measure of what is to be estimated.

iv. Indeterminacy principle: Sometimes it is found that individuals act differently when kept under observation than what they do when kept in non-observed situations. For instance, if workers are aware that somebody is observing them in course of a work study on the basis of which the average length of time to complete a task will be determined and accordingly the quota will be set for piece work, they generally tend to work slowly in comparison to the speed with which they work if kept unobserved. Thus, the indeterminacy principle may also be a cause of a systematic bias.

v. Natural bias in the reporting of data: Natural bias of respondents in the reporting of data is often the cause of a systematic bias in many inquiries. There is usually a downward bias in the income data collected by government taxation department, whereas we find an upward bias in the income data collected by some social organization. People in general understate their incomes if asked about it for tax purposes but they overstate the same if asked for social status or their affluence. Generally in psychological surveys, people tend to give what they think is the correct answer rather than revealing their true feelings.

9. What is sampling error?

Sampling error is the random variation in the sample estimates around the true population parameters.

10. Characteristics of a good sample design?

The following are the characteristics of a good sample design:

- i. Sample design must result in a truly representative sample
- ii. Sample design must be which results in a small sampling error
- iii. Sample design must be viable in the context of funds available for the research study
- iv. Sample design must be such so that systematic bias can be controlled in a better way
- v. 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

10. Sample size and its determination (Problem only).

Problem:

A population is divided into 3 strata so that $N_1 = 5000$, $N_2 = 2000$ and $N_3 = 3000$. Respective standard deviations are:

$$\sigma_1 = 15, \sigma_2 = 15 \text{ and } \sigma_3 = 5$$

How should a sample of size $n = 84$ be allocated to the 3 strata, if we want optimum allocation using disproportionate sampling design?

Ans:

Using the disproportionate sampling design for optimum allocation, the sample sizes for different strata will be determined as under:

Sample size for strata with $N_1 = 5000$

$$n_1 = \frac{84(5000)(15)}{(5000)(15) + (2000)(18) + (3000)(5)} = 6300000/126000 = 50$$

Sample size for strata with $N_2 = 2000$

$$n_2 = \frac{84(2000)(18)}{(5000)(15) + (2000)(18) + (3000)(5)} = 3024000/126000 = 24$$

Sample size for strata with $N_3 = 3000$

$$n_3 = \frac{84(3000)(5)}{(5000)(15) + (2000)(18) + (3000)(5)} = 1260000/126000 = 10$$

Now, $n = (n_1 + n_2 + n_3) = (50 + 24 + 10) = 84$ and the allocation would be 50 from n_1 , 24 from n_2 and 10 from n_3 .

11. What is primary and secondary data (93)?

Generally, the task of data collection starts after a research problem has been defined and chalked out. There are two types of data viz., primary data and secondary data.

The primary data are those which are collected anew and for the first time and thus happen to be original in character. For example, questionnaires, survey method, observations etc.

On the other hand, secondary data are those which have already been published and collected by someone else and which have already been passed through the statistical process. For example, published reports, index data, GDP, foreign exchange etc.

12. What are the methods of collecting primary data?

There are several methods to collect primary data particularly in surveys and descriptive researchers. They are as under:

1. Observation method: The observation method is the most commonly used method particularly in studies relating to behavioral sciences. In a way we all observe things around us but this sort of observation is unscientific observation. Observation becomes a scientific tool and the method of data collection for the researcher, when it serves a formulated research purpose, is systematically planned and recorded and is subjected to checks and controls on validity and reliability. Under this observation method, the information is sought by way of investigator's own direct observation without asking from the respondent. Although, it is an expensive method and the information provided by this method is very limited and sometimes unforeseen factors may interfere with the observational task.

2. Interview method: The interview method of collecting data involves presentation of oral-verbal stimuli and reply in terms of oral-verbal responses. This method can be used through personal interviews and if possible through telephone interviews. Personal interview method requires a person known as the interviewer asking questions generally in a face-to-face contact to the other person or persons and this type of interviewed may be in the form of direct personal investigation or it may be indirect oral investigation.

3. Through questionnaires: This method of data collection is quite popular, particularly in case of big enquiries. It is being adopted by private individuals, research workers, private and public organizations and even by governments. In this method a questionnaire is sent (usually by post) to the persons concerned with a request to answer the questions and return it. A questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms. The questionnaire is mailed to respondents who are expected to read and understand the questions and write down the reply in the space meant for the purpose in the questionnaire itself. The respondents have to answer the questions on their own.

4. Through schedules: This method of data collection is very much like the collection of data through questionnaire, with little difference which lies in the fact schedules are being filled in by the enumerators who are specially appointed for the purpose. These enumerators along with schedules go to respondents put to them the questions from the proforma in the order the questions are listed and record the replies in the space meant for the same in the proforma. This method requires the selection of enumerators for filling up schedules or assisting respondents to fill up schedules and as such enumerators should be very carefully selected. This method of data collection is very useful in extensive enquiries and can lead to fairly reliable results.

5. Warranty cards: Warranty cards are usually postal sized cards which are used by dealers of consumer durables to collect information regarding their products. The information sought is printed in the form of questions on the warranty cards which is placed inside the package along with the product with a request to the consumer to fill the card and post it back to the dealer.

6. Distributor or store audits: Distributor or store audit is performed by distributors as well as manufactures through their salesman at regular intervals. Distributors get the retail stores audited through salesman and use such

information to estimate market size, market share, and seasonal purchasing pattern and so on. The data are obtained in such audits not by questioning but by observation.

7. *Pantry audits:* Pantry audit technique is used to estimate consumption of the basket of goods at the consumer level. In this type of audit, the investigator collects an inventory of types, quantities and prices of commodities consumed. Thus in pantry audit data are recorder from the examination of consumer's pantry. The usual objective in a pantry audit is to find out what types of consumers buy certain products and certain brands, the assumption being that the contents of the pantry accurately reveal consumer's preferences.

8. *Consumer panels:* An extension of the pantry audit approach on a regular basis is known as consumer panel, where a set of consumers are arranged to come to an understanding to maintain detailed daily records of their consumption and the same is made available to investigator on demands. In other words, a consumer panel is essentially a sample of consumers who are interviewed repeatedly over a period of time.

9. *Using mechanical devices:* The use of mechanical devices has been widely made to collect information by way of indirect means. Eye camera, pupilometric camera, psychogalvanometer, motion picture camera and audiometer are the principal devices so far developed and commonly used by modern big business houses mostly in the developed world for the purpose of collecting the required information.

10. *Through projective techniques:* Projective techniques (indirect interviewing techniques) for the collection of data have been developed by psychologists to use projections of respondents for inferring about underlying motives, urges or intentions which are such that the respondent either resists to reveal them or is unable to figure out himself. In projective techniques the respondent in supplying information tends unconsciously to project his own attitudes or feelings on the subject under study. Projective techniques play an important role in motivational researchers or in attitude surveys.

11. *Depth interviews:* Depth interviews are those interviews that are designed to discover underlying motives and desires and are often used in motivational research. Such interviews are held to explore needs, desires and feelings of respondents. In other words, they aim to bring out unconscious as also other types of material relating especially to personality dynamics and motivations.

12. *Content analysis:* Content analysis consists of analyzing the contents of documentary materials such as books, magazines, newspapers and the contents of all other verbal materials which can be either spoken or printed.

13. What are the points should be taken into care before using secondary data?

In general researcher must be very careful in using secondary data. The researcher should take the following points before using secondary data as under:

i. *Reliability of data:* The reliability can be tested by finding out such things about the said data: (a) Who collected the data (b) What were the sources of data (c) Were they collected by using proper methods (d) At what time were they collected (e) Was there any bias of the compiler (f) What level of accuracy was desired and was it achieved?

ii. *Suitability of data:* The data that are suitable for one enquiry may not necessarily be found suitable in another enquiry. Hence, if the available data are found to be unsuitable, they should not be used by the researcher. In this context, the researcher must very carefully scrutinize the definition of various terms and units of collection used at the time of collecting the data from the primary source originally. Similarly, the object, scope and nature of the original enquiry must also be studied. If the researcher finds differences in these, the data will remain unsuitable for the present enquiry and should not be used.

iii. *Adequacy of data:* If the level of accuracy achieved in data is found inadequate for the purpose of the present enquiry, they will be considered as inadequate and should not be used by the researcher. The data is also being considered inadequate, if they are related to an area which may be either narrower or wider than the area of the present enquiry.

From the above discussion we can say that it is very risky to use the already available data. The published data should be used by the researcher only when he finds them reliable.

14. What are the guidelines for constructing questionnaire/schedule?

The researcher must pay attention to the following points/guidelines in constructing an appropriate and effective questionnaire or a schedule:

- i. The researcher must keep in view the problem he has been chalked out and that provides the starting point for developing the questionnaire/schedule. He/she must be clear about the various aspects of his research problem to be dealt with in the course of his research project.
- ii. Appropriate form of questions depends on the nature of information sought, the sampled respondents and the kind of analysis intended. The researcher must decide whether to use closed or open-ended question. Questions should be simple and must be constructed with a view to their forming a logical part of a well thought out tabulation plan. The units of enumeration should also be defined so that they can ensure accurate and full information.
- iii. Rough draft of the questionnaire/schedule be prepared, giving due thought to the appropriate sequence of putting questions. Questionnaires or schedules previously drafted may as well be looked into at this stage.
- iv. Researcher must invariably re-examine and in case of need may revise the rough draft for a better one. Technical defects must be minutely scrutinized and removed.
- v. Pilot study should be undertaken for pre-testing the questionnaire. The questionnaire may be edited in the light of the results of the pilot study.
- vi. Questionnaire must contain simple but straight forward directions for the respondents so that they may not feel any difficulty in answering the questions.