

## A NOVEL APPROACH TO STUDY THE RESEARCH METHODOLOGY

Neelam Tyagi\*

DR. R. G. Varshney\*\*

DR. A. B. Chandramouli\*\*\*

### **Abstract:**

We propose to present a brief introduction of the research methodology in which the meaning and objective of research, research approach and scientific methods of research. We shall outline the criteria of good research and research process. We shall identify the domain of proposed research with the identification of problem by finding the gaps in the papers reviewed or by generalizing the problem by incremental method. Different concepts and definitions we studies critically examine the results already existence. We shall also need to design research having features. Basic principles of experimental design will also be taken into consideration for developing research plan.

\* Corresponding author, Research Scholar, Graphic Era University, Dehradun, Uttarakhand

\*\* Professor, Department of mathematics, Graphic Era University, Dehradun, Uttarakhand

\*\*\* Associate professor, Department of Mathematics, Meerut college, Meerut, UttarPradesh

## 1. INTRODUCTION:

Research in common parlance refers to a search for knowledge. Research is an organized and systematic way of finding answers to questions. Effective research methods are the tools by which information is gathered. Without the appropriate design and use of research methods, we are unlikely to gather quality information and as such create a shaky foundation to any review, evaluation or future strategy. A process of enquiry and investigation; it is systematic, methodical and ethical; research can help solve practical problems and increase knowledge.

- **Methodology** - the study of the methods involved in some field, endeavor, or in problem solving
- **Method** - a (systematic ?) codified series of steps taken to complete a certain task or to reach a certain objective

“*Research methodology*” is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. It is necessary for the researcher to know not only the research methods/techniques but also the methodology. Researchers not only need to know how to develop certain indices or tests, how to calculate the mean, the mode, the median or the standard deviation or chi-square, how to apply particular research techniques, but they also need to know which of these methods or techniques, are relevant and which are not, and what would they mean and indicate and why. Researchers also need to understand the assumptions underlying various techniques and they need to know the criteria by which they can decide that certain techniques and procedures will be applicable to certain problems and others will not. All this means that it is necessary for the researcher to design his methodology for his problem as the same may differ from problem to problem. For example, an architect, who designs a building, has to consciously evaluate the basis of his decisions, i.e., he has to evaluate why and on what basis he selects particular size, number and location of doors, windows and ventilators, uses particular materials and not others and the like. Similarly, in research the scientist has to expose the research decisions to evaluation before they are implemented. He has to specify very clearly and precisely what decisions he selects and why he selects them so that they can be evaluated by others also. From what has been stated above, we can say that research methodology has many dimensions and research methods do constitute a part of the research methodology. The scope of research methodology is wider than that of research methods.

*“Thus, when we talk of research methodology we not only talk of the research methods but also consider the logic behind the methods we use in the context of our research study and explain why we are using a particular method or technique and why we are not using others so that research results are capable of being evaluated either by the researcher himself or by others”.*

## 2. DEFINITION OF RESEARCH

When you say that you are undertaking a research study to find answers to a question, you are implying that the process;

- i. is being undertaken within a framework of a set of philosophies ( approaches);
- ii. uses procedures, methods and techniques that have been tested for their Validity and Reliability;
- iii. is designed to be unbiased and objective .

*Philosophies* mean approaches e.g. qualitative, quantitative and the academic discipline in which you have been trained.

*Validity* means that correct procedures have been applied to find answers to a question.

*Reliability* refers to the quality of a measurement procedure that provides repeatability and accuracy.

*Unbiased and objective* means that you have taken each step in an unbiased manner and drawn each conclusion to the best of your ability and without introducing your own vested interest.

*(Bias is a deliberate attempt to either conceal or highlight something).*

Adherence to the three criteria mentioned above enables the process to be called ‘research’.

The word research is composed of two syllables, *re* and *search*. “*re*” is a prefix meaning again, anew or over again “*search*” is a verb meaning to examine closely and carefully, to test and try, or to probe. Together they form a noun *describing a careful, systematic, patient study and investigation in some field of knowledge, undertaken to establish facts or principles.* Research is a *structured enquiry that utilizes acceptable scientific methodology to solve problems and create new knowledge that is generally applicable.* Scientific methods consist of systematic observation, classification and interpretation of data.

### 2.1 THE PURPOSE OF RESEARCH IS TO...

- Review or synthesize existing knowledge

- Investigate existing situations or problems
- Provide solutions to problems
- Explore and analyse more general issues
- Construct or create new procedures or systems
- Explain new phenomenon
- Generate new knowledge
- ...or a combination of any of the above!

(Collis & Hussey, 2003)

## 2.2 OBJECTIVES OF RESEARCH

The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:

- To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as *exploratory* or *formulative* research studies);
- To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as *descriptive* research studies);
- To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as *diagnostic* research studies);
- To test a hypothesis of a causal relationship between variables (such studies are known as *Hypothesis-testing* research studies).

## 2.3 MOTIVATION IN RESEARCH

What makes people to undertake research? This is a question of fundamental importance. The possible motives for doing research may be either one or more of the following:

- Desire to get a research degree along with its consequential benefits;
- Desire to face the challenge in solving the unsolved problems, i.e., concern over practical problems initiates research;
- Desire to get intellectual joy of doing some creative work;
- Desire to be of service to society;
- Desire to get respectability.

However, this is not an exhaustive list of factors motivating people to undertake research studies. Many more factors such as directives of government, employment conditions, curiosity about new things, desire to understand causal relationships, social thinking and awakening, and the like may as well motivate (or at times compel) people to perform research operations.

## 2.4 CHARACTERISTICS OF RESEARCH:

Research is a process of collecting, analyzing and interpreting information to answer questions. But to qualify as research, the process must have certain characteristics: it must, as far as possible, be controlled, rigorous, systematic, valid and verifiable, empirical and critical.

- i. **Controlled**- in real life there are many factors that affect an outcome. The concept of control implies that, in exploring causality in relation to two variables (factors), you set up your study in a way that minimizes the effects of other factors affecting the relationship.
- ii. **Rigorous**-you must be scrupulous in ensuring that the procedures followed to find answers to questions are *relevant, appropriate and justified*. Again, the degree of rigor varies markedly between the physical and social sciences and within the social sciences.
- iii. **Systematic**-this implies that the procedure adopted to undertake an investigation follow a certain logical sequence. The different steps cannot be taken in a haphazard way. Some procedures must follow others.
- iv. **Valid and verifiable**-this concept implies that whatever you conclude on the basis of your findings is correct and can be verified by you and others.
- v. **Empirical**-this means that any conclusion drawn is based upon hard evidence gathered from information collected from real life experiences or observations.
- vi. **Critical**-critical scrutiny of the procedures used and the methods employed is crucial to a research enquiry. The process of investigation must be foolproof and free from drawbacks. The process adopted and the procedures used must be able to withstand critical scrutiny.

*“For a process to be called research, it is imperative that it has the above characteristics.”*

## 3 TYPES OF RESEARCH

The basic types of research are as follows:

- i. **Descriptive vs. Analytical:** *Descriptive research* includes surveys and fact-finding enquiries of different kinds. The major purpose of descriptive research is description of the state of affairs as

it exists at present. The main characteristic of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening. The methods of research utilized in descriptive research are survey methods of all kinds, including comparative and correlation methods. In *analytical research*, on the other hand, the researcher has to use facts or information already available, and analyze these to make a critical evaluation of the material.

- ii. *Applied vs. Fundamental*: Research can either be applied (or action) research or fundamental (to basic or pure) research. *Applied research* aims at finding a solution for an immediate problem facing a society or an industrial/business organization, whereas *fundamental research* is mainly concerned with generalizations and with the formulation of a theory. "Gathering knowledge for knowledge's sake is termed 'pure' or 'basic' research." [4] research studies, concerning human behavior carried on with a view to make generalizations about human behavior, are also examples of fundamental research, but research aimed at certain conclusions (say, a solution) facing a concrete social or business problem is an example of applied research. Thus, the central aim of applied research is to discover a solution for some pressing practical problem, whereas basic research is directed towards finding information that has a broad base of applications and thus, adds to the already existing organized body of scientific knowledge.
- iii. *Quantitative vs. Qualitative*: Quantitative research is based on the measurement of quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity. Qualitative research, on the other hand, is concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind. Quantitative research is on collecting and analyzing numerical data; it concentrates on **measuring** the scale, range, frequency etc. of phenomena. This type of research, although harder to design initially, is usually highly detailed and structured and results can be easily collated and presented statistically. **Qualitative** research is more subjective in nature than Quantitative research and involves examining and reflecting on the less tangible aspects of a research subject, e.g. values, attitudes, perceptions. Although this type of research can be easier to start, it can be often difficult to interpret and present the findings; the findings can also be challenged more easily.
- iv. *Conceptual vs. Empirical*: Conceptual research is that related to some abstract idea(s) or theory. It is generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones. On the other hand, empirical research relies on experience or observation alone, often without due regard for system and theory. It is data-based research.

- v. *Some Other Types of Research:* All other types of research are variations of one or more of the above stated approaches, based on either the purpose of research, or the time required to accomplish research, on the environment in which research is done, or on the basis of some other similar factor. From the point of view of time, we can think of research either as *one-time research* or *longitudinal research*. In the former case the research is confined to a single time-period, whereas in the latter case the research is carried on over several time-periods. Research can be *field-setting research* or *laboratory research* or *simulation research*, depending upon the environment in which it is to be carried out. Research can as well be understood as *clinical* or *diagnostic research*. The research may be *exploratory* or it may be formalized. The objective of exploratory research is the development of hypotheses rather than their testing, whereas formalized research studies are those with substantial structure and with specific hypotheses to be tested. *Historical research* is that which utilizes historical sources like documents, remains, etc. to study events or ideas of the past, including the philosophy of persons and groups at any remote point of time. Research can also be classified as *conclusion-oriented* and decision-oriented. While doing conclusion oriented research, a researcher is free to pick up a problem, redesign the enquiry as he proceeds and is prepared to conceptualize as he wishes.

### 3.1 RESEARCH APPROACHES

The above description of the types of research brings to light the fact that there are two basic approaches to research, viz., *quantitative approach* and the *qualitative approach*. The former involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion. This approach can be further sub-classified into *inferential*, *experimental* and *simulation approaches* to research. The purpose of *inferential approach* to research is to form a data base from which to infer characteristics or relationships of population. This usually means survey research where a sample of population is studied (questioned or observed) to determine its characteristics, and it is then inferred that the population has the same characteristics. *Experimental approach* is characterized by much greater control over the research environment and in this case some variables are manipulated to observe their effect on other variables. *Simulation approach* involves the construction of an artificial environment within which relevant information and data can be generated.

*Qualitative approach* to research is concerned with subjective assessment of attitudes, opinions and behavior. Research in such a situation is a function of researcher's insights and impressions. Such an approach to research generates results either in non-quantitative form or in the form which are not subjected to rigorous quantitative analysis. Generally, the techniques of focus group interviews, projective techniques and depth interviews are used. All these are explained at length in chapters that follow.

### 3.2 SIGNIFICANCE OF RESEARCH

“All progress is born of inquiry. Doubt is often better than overconfidence, for it leads to inquiry, and inquiry leads to invention” is a famous Hudson Maxim in context of which the significance of research can well be understood. Increased amounts of research make progress possible. *Research inculcates scientific and inductive thinking and it promotes the development of logical habits of thinking and organization.*

- *The role of research in several fields of applied economics, whether related to business or to the economy as a whole, has greatly increased in modern times.*
- *Research provides the basis for nearly all government policies in our economic system.*

In the context of government, research as a tool to economic policy has three distinct phases of operation, viz.,

- (i) investigation of economic structure through continual compilation of facts;
- (ii) diagnosis of events that are taking place and the analysis of the forces underlying them; and
- (iii) The prognosis, i.e., the prediction of future developments.

*Research has its special significance in solving various operational and planning problems of business and industry.*

- a) To those students who are to write a master's or Ph.D. thesis, research may mean a careerism or a way to attain a high position in the social structure;
- b) To professionals in research methodology, research may mean a source of livelihood;
- c) To philosophers and thinkers, research may mean the outlet for new ideas and insights;
- d) To literary men and women, research may mean the development of new styles and creative work;
- e) To analysts and intellectuals, research may mean the generalizations of new theories.



## 5. MEANING AND FEATURES OF RESEARCH DESIGN

The formidable problem that follows the task of defining the research problem is the preparation of the design of the research project, popularly known as the “research design”. “A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.”

More explicitly, the design decisions happen to be in respect of:

- (i) What is the study about?
- (ii) Why is the study being made?
- (iii) Where will the study be carried out?
- (iv) What type of data is required?
- (v) Where can the required data be found?
- (vi) What periods of time will the study include?
- (vii) What will be the sample design?
- (viii) What techniques of data collection will be used?
- (ix) How will the data be analyzed?
- (x) In what style will the report be prepared?

Keeping in view the above stated design decisions; one may split the overall research design into the following parts:

- a) *the sampling design* which deals with the method of selecting items to be observed for the given study;
- b) *the observational design* which relates to the conditions under which the observations are to be made;
- c) *the statistical design* which concerns with the question of how many items are to be observed and how the information and data gathered are to be analyzed; and
- d) *the operational design* which deals with the techniques by which the procedures specified in the sampling, statistical and observational designs can be carried out. From what has been stated above, we can state the important features of a research design as under:
  - i. It is a plan that specifies the sources and types of information relevant to the research problem.
  - ii. It is a strategy specifying which approach will be used for gathering and analyzing the data.
  - iii. It also includes the time and cost budgets since most studies are done under these two constraints.

### 5.1 FEATURES OF A GOOD DESIGN

A good design is often characterized by adjectives like flexible, appropriate, efficient, and economical and so on. Generally, the design which minimizes bias and maximizes the reliability of the data collected and analyzed is considered a good design. A research design appropriate for a particular research problem, usually involves the consideration of the following factors:

- i. the means of obtaining information;
- ii. the availability and skills of the researcher and his staff, if any;
- iii. the objective of the problem to be studied;
- iv. the nature of the problem to be studied; and
- v. the availability of time and money for the research work.

## 6 RESEARCH PROCESS

Research process consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps. The chart shown in Figure 1.1 well illustrates a research process. The chart indicates that the research process consists of a number of closely related activities, as shown through 1 to 7. But such activities overlap continuously rather than following a strictly prescribed sequence. At times, the first step determines the nature of the last step to be undertaken. If subsequent procedures have not been taken into account in the early stages, serious difficulties may arise which may even prevent the completion of the study. One should remember that the various steps involved in a research process are not mutually exclusive; nor are they separate and distinct. They do not necessarily follow each other in any specific order and the researcher has to be constantly anticipating at each step in the research process the requirements of the subsequent steps.

However, the following order concerning various steps provides a useful procedural guideline regarding the research process:

(1) formulating the research problem; (2) extensive literature survey; (3) developing the hypothesis; (4) preparing the research design; (5) determining sample design; (6) collecting the data; (7) execution of the project; (8) analysis of data; (9) hypothesis testing; (10) generalizations and interpretation, and (11) preparation of the report or presentation of the results, i.e., formal write-up of conclusions reached.

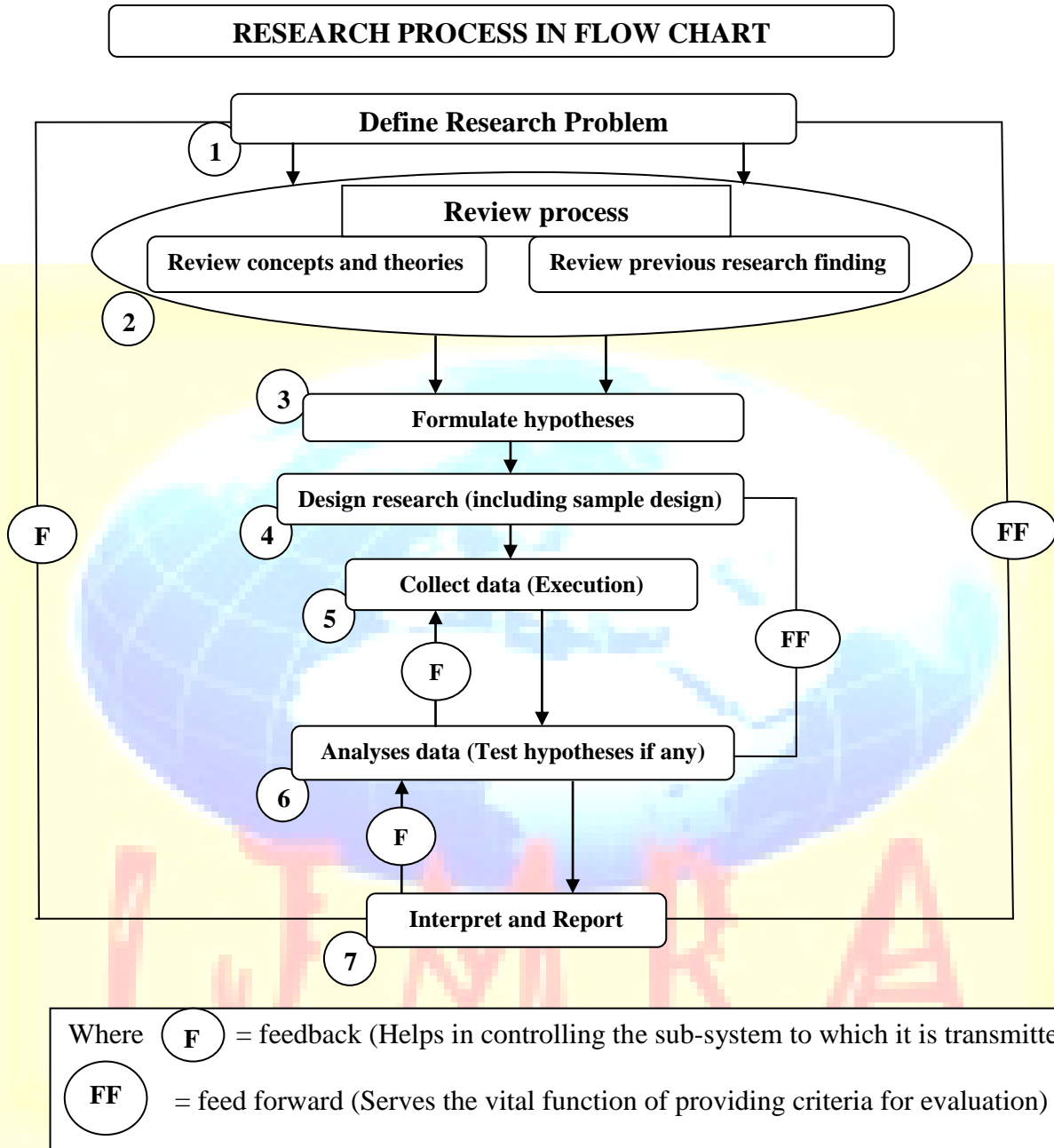


Fig. 1.1

**A brief description of the above stated steps:**

- i. **Formulating the research problem:** There are two types of research problems, viz., those which relate to states of nature and those which relate to relationships between variables. At the very outset the researcher must single out the problem he wants to study,
- ii. i.e., he must decide the general area of interest or aspect of a subject-matter that he would like to inquire into. Initially the problem may be stated in a broad general way and then the ambiguities, if any, relating to the problem be resolved. Then, the feasibility of a particular solution has to be considered before a working formulation of the problem can be set up. The formulation of a general topic into a specific research problem, thus, constitutes the first step in a scientific enquiry. Essentially two steps are involved in formulating the research problem, viz., understanding the problem thoroughly, and rephrasing the same into meaningful terms from an analytical point of view.
- iii. **Extensive literature survey:** Once the problem is formulated, a brief summary of it should be written down. It is compulsory for a research worker writing a thesis for a Ph.D. degree to write a synopsis of the topic and submit it to the necessary Committee or the Research Board for approval. At this juncture the researcher should undertake extensive literature survey connected with the problem. For this purpose, the abstracting and indexing journals and published or unpublished bibliographies are the first place to go to. Academic journals, conference proceedings, government reports, books etc., must be tapped depending on the nature of the problem. In this process, it should be remembered that one source will lead to another. The earlier studies, if any, which are similar to the study in hand, should be carefully studied. A good library will be a great help to the researcher at this stage.
- iv. **Development of working hypotheses:** After extensive literature survey, researcher should state in clear terms the working hypothesis or hypotheses. Working hypothesis is tentative assumption made in order to draw out and test its logical or empirical consequences. How does one go about developing working hypotheses? The answer is by using the following approach:
  - a) Discussions with colleagues and experts about the problem, its origin and the objectives in seeking a solution;
  - b) Examination of data and records, if available, concerning the problem for possible trends, peculiarities and other clues;
  - c) Review of similar studies in the area or of the studies on similar problems; and

- d) Exploratory personal investigation which involves original field interviews on a limited scale with interested parties and individuals with a view to secure greater insight into the practical aspects of the problem.

Thus, working hypotheses arise as a result of a-priori thinking about the subject, examination of the available data and material including related studies and the counsel of experts and interested parties. But as a general rule, specification of working hypotheses in another basic step of the research process in most research problems.

- v. **Preparing the research design:** The research problem having been formulated in clear cut terms, the researcher will be required to prepare a research design. The function of research design is to provide for the collection of relevant evidence with minimal expenditure of effort, time and money. But how all these can be achieved depends mainly on the research purpose. Research purposes may be grouped into four categories, viz., (i) Exploration, (ii) Description, (iii) Diagnosis, and (iv) Experimentation.

There are several research designs, such as, experimental and non-experimental hypothesis testing. Experimental designs can be either informal design (such as before-and-after without control, after-only with control, before-and-after with control) or formal designs (such as completely randomized design, randomized block design, Latin square design, simple and complex factorial designs), out of which the researcher must select one for his own project. The preparation of the research design, appropriate for a particular research problem, involves usually the consideration of the following:

- a) the means of obtaining the information;
  - b) the availability and skills of the researcher and his staff (if any);
  - c) explanation of the way in which selected means of obtaining information will be organized and the reasoning leading to the selection;
  - d) the time available for research; and
  - e) the cost factor relating to research, i.e., the finance available for the purpose.
- vi. **Determining sample design:** All the items under consideration in any field of inquiry constitute a 'universe' or 'population'. A complete enumeration of all the items in the 'population' is known as a census inquiry. It can be presumed that in such an inquiry when all the items are covered no element of chance is left and highest accuracy is obtained. But in practice this may not be true. The researcher must decide the way of selecting a sample or what is popularly

known as the sample design. In other words, a sample design is a definite plan determined before any data are actually collected for obtaining a sample from a given population. Samples can be either probability samples or non-probability samples. Probability samples are those based on simple random sampling, systematic sampling, stratified sampling, cluster/area sampling whereas non-probability samples are those based on convenience sampling, judgment sampling and quota sampling techniques. *The sample design to be used must be decided by the researcher taking into consideration the nature of the inquiry and other related factors.*

vii. **Collecting the data:** In dealing with any real life problem it is often found that data at hand are inadequate, and hence, it becomes necessary to collect data that are appropriate. There are several ways of collecting the appropriate data which differ considerably in context of money costs, time and other resources at the disposal of the researcher. Primary data can be collected either through experiment or through survey. If the researcher conducts an experiment, he observes some quantitative measurements, or the data, with the help of which he examines the truth contained in his hypothesis. But in the case of a survey, data can be collected by any one or more of the following ways:

- *By observation:* This method implies the collection of information by way of investigator's own observation, without interviewing the respondents. The information obtained relates to what is currently happening and is not complicated by either the past behavior or future intentions or attitudes of respondents. This method is no doubt an expensive method and the information provided by this method is also very limited. As such this method is not suitable in inquiries where large samples are concerned.
- *Through personal interview:* The investigator follows a rigid procedure and seeks answers to a set of pre-conceived questions through personal interviews. This method of collecting data is usually carried out in a structured way where output depends upon the ability of the interviewer to a large extent.
- *Through telephone interviews:* This method of collecting information involves contacting the respondents on telephone itself. This is not a very widely used method but it plays an important role in industrial surveys in developed regions, particularly, when the survey has to be accomplished in a very limited time.
- *By mailing of questionnaires:* The researcher and the respondents do come in contact with each other if this method of survey is adopted. Questionnaires are mailed to the respondents with a

request to return after completing the same. It is the most extensively used method in various economic and business surveys. Before applying this method, usually a Pilot Study for testing the questionnaire is conducted this reveals the weaknesses, if any, of the questionnaire. Questionnaire to be used must be prepared very carefully so that it may prove to be effective in collecting the relevant information.

- *Through schedules:* Under this method the enumerators are appointed and given training. They are provided with schedules containing relevant questions. These enumerators go to respondents with these schedules. Data are collected by filling up the schedules by enumerators on the basis of replies given by respondents. Much depends upon the capability of enumerators so far as this method is concerned. Some occasional field checks on the work of the enumerators may ensure sincere work.

*The researcher should select one of these methods of collecting the data taking into consideration the nature of investigation, objective and scope of the inquiry, financial resources, available time and the desired degree of accuracy.* Though he should pay attention to all these factors but much depends upon the ability and experience of the researcher. In this context *Dr A.L. Bowley* very aptly remarks that in collection of statistical data commonsense is the chief requisite and experience the chief teacher.

- viii. **Execution of the project:** Execution of the project is a very important step in the research process. If the execution of the project proceeds on correct lines, the data to be collected would be adequate and dependable. The researcher should see that the project is executed in a systematic manner and in time. If the survey is to be conducted by means of structured questionnaires, data can be readily machine-processed. In such a situation, questions as well as the possible answers may be coded. If the data are to be collected through interviewers, arrangements should be made for proper selection and training of the interviewers. The training may be given with the help of instruction manuals which explain clearly the job of the interviewers at each step.
- ix. **Analysis of data:** After the data have been collected, the researcher turns to the task of analyzing them. The analysis of data requires a number of closely related operations such as establishment of categories, the application of these categories to raw data through coding, tabulation and then drawing statistical inferences. Researcher should classify the raw data into some purposeful and usable categories. *Coding* operation is usually done at this stage through which the categories of

data are transformed into symbols that may be tabulated and counted. *Editing* is the procedure that improves the quality of the data for coding. With coding the stage is ready for tabulation. *Tabulation* is a part of the technical procedure wherein the classified data are put in the form of tables. A great deal of data, especially in large inquiries, is tabulated by computers. Computers not only save time but also make it possible to study large number of variables affecting a problem simultaneously.

- x. **Hypothesis-testing:** After analyzing the data as stated above, the researcher is in a position to test the hypotheses, if any, he had formulated earlier. Do the facts support the hypotheses or they happen to be contrary? This is the usual question which should be answered while testing hypotheses. Various tests, such as Chi square test, *t*-test, *F*-test, have been developed by statisticians for the purpose. The hypotheses may be tested through the use of one or more of such tests, depending upon the nature and object of research inquiry. Hypothesis-testing will result in either accepting the hypothesis or in rejecting it. If the researcher had no hypotheses to start with, generalizations established on the basis of data may be stated as hypotheses to be tested by subsequent researches in times to come.
- xi. **Generalizations and interpretation:** If a hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at generalization, i.e., to build a theory. As a matter of fact, the real value of research lies in its ability to arrive at certain generalizations. If the researcher had no hypothesis to start with, he might seek to explain his findings on the basis of some theory. It is known as interpretation. The process of interpretation may quite often trigger off new questions which in turn may lead to further researches.
- xii. **Preparation of the report or the thesis:** Finally, the researcher has to prepare the report of what has been done by him. Writing of report must be done with great care keeping in view the following:
  - I. The layout of the report should be as follows: (i) the preliminary pages; (ii) the main text, and (iii) the end matter.

*In its preliminary pages* the report should carry title and date followed by acknowledgements and foreword. Then there should be a table of contents followed by a list of tables and list of graphs and charts, if any, given in the report.

*The main text of the report* should have the following parts:



(a) *Introduction*: It should contain a clear statement of the objective of the research and an explanation of the methodology adopted in accomplishing the research. The scope of the study along with various limitations should as well be stated in this part.

(b) *Summary of findings*: After introduction there would appear a statement of findings and recommendations in non-technical language. If the findings are extensive, they should be summarized.

(c) *Main report*: The main body of the report should be presented in logical sequence and broken-down into readily identifiable sections.

(d) *Conclusion*: Towards the end of the main text, researcher should again put down the results of his research clearly and precisely. In fact, it is the final summing up.

*At the end of the report*, appendices should be enlisted in respect of all technical data.

### **Bibliography,**

i.e., list of books, journals, reports, etc., consulted, should also be given in the end. Index should also be given specially in a published research report.

- II. Report should be written in a concise and objective style in simple language avoiding vague expressions such as ‘it seems,’ ‘there may be’, and the like.
- III. Charts and illustrations in the main report should be used only if they present the information more clearly and forcibly.
- IV. Calculated ‘confidence limits’ must be mentioned and the various constraints experienced in conducting research operations may as well be stated.

## **7 CRITERIA OF GOOD RESEARCH**

Whatever may be the types of research works and studies, one thing that is important is that they all meet on the common ground of scientific method employed by them. One expects scientific research to satisfy the following criteria:[11]

- i. The purpose of the research should be clearly defined and common concepts be used.
- ii. The research procedure used should be described in sufficient detail to permit another researcher to repeat the research for further advancement, keeping the continuity of what has already been attained.

- iii. The procedural design of the research should be carefully planned to yield results that are as objective as possible.
- iv. The researcher should report with complete frankness, flaws in procedural design and estimate their effects upon the findings.
- v. The analysis of data should be sufficiently adequate to reveal its significance and the methods of analysis used should be appropriate. The validity and reliability of the data should be checked carefully.
- vi. Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis.
- vii. Greater confidence in research is warranted if the researcher is experienced, has a good reputation in research and is a person of integrity.

In other words, we can state the qualities of a good research as under:[12]

- a) *Good research is systematic:* It means that research is structured with specified steps to be taken in a specified sequence in accordance with the well defined set of rules. Systematic characteristic of the research does not rule out creative thinking but it certainly does reject the use of guessing and intuition in arriving at conclusions.
- b) *Good research is logical:* This implies that research is guided by the rules of logical reasoning and the logical process of induction and deduction are of great value in carrying out research. Induction is the process of reasoning from a part to the whole whereas deduction is the process of reasoning from some premise to a conclusion which follows from that very premises. In fact, logical reasoning makes research more meaningful in the context of decision making.
- c) *Good research is empirical:* It implies that research is related basically to one or more aspects of a real situation and deals with concrete data that provides a basis for external validity to research results.
- d) *Good research is replicable:* This characteristic allows research results to be verified by replicating the study and thereby building a sound basis for decisions.

## 8 PROBLEMS ENCOUNTERED BY RESEARCHERS IN INDIA

Researchers in India, particularly those engaged in empirical research, are facing several problems. Some of the important problems are as follows:

- a) *The lack of a scientific training in the methodology of research is a great impediment for researchers in our country. efforts should be made to provide short duration intensive courses for meeting this requirement.*
- b) *There is insufficient interaction between the university research departments on one side and business establishments, government departments and research institutions on the other side. Efforts should be made to develop satisfactory liaison among all concerned for better and realistic researches.*
- c) *There is the need for generating the confidence that the information/data obtained from a business unit will not be misused.*
- d) *Research studies overlapping one another are undertaken quite often for want of adequate information.*
- e) *There does not exist a code of conduct for researchers and inter-university and interdepartmental rivalries are also quite common.*
- f) *Many researchers in our country also face the difficulty of adequate and timely secretarial assistance, including computerial assistance.*
- g) *Library management and functioning is not satisfactory at many places and much of the time and energy of researchers are spent in tracing out the books, journals, reports, etc., rather than in tracing out relevant material from them.*
- h) *There is also the problem that many of our libraries are not able to get copies of old and new Acts/Rules, reports and other government publications in time.*
- i) *There is also the difficulty of timely availability of published data from various government and other agencies doing this job in our country*
- j) *There may, at times, take place the problem of conceptualization and also problems relating to the process of data collection and related things.*

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