

# RESEARCH METHODOLOGY

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## Introduction:

Research may be very broadly defined as systematic gathering of data and information and its analysis for advancement of knowledge in any subject. Research attempts to find answer intellectual and practical questions through application of systematic methods.

Some people consider research as a movement, a movement from the known to the unknown.

# Meaning of research:

Research methodology is the specific procedures or techniques used to identify, select, process, and analyse information about a certain topic. The methodology section allows the reader to critically evaluate a study's overall validity and reliability.

# DEFINATION OF RESEARCH:

Research is an academic activity and as such the term should be used in a technical sense. Definitions of research methodology by various authours:

According to Clifford Woody research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis.

According to “ D. Steiner and M. Stephenson in the Encyclopedia of Social Sciences define research as “the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art.”

# SIGNIFICANCE OF RESEARCH:

“All progress is born of inquiry. Doubt is often better than over-confidence, for it leads to inquiry leads to invention” [\\_Hudson maxim.](#)

Research inculcates scientific and inductive thinking and it promotes the development of logical habits of thinking and organization.

# 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:

1. To gain familiarity with a phenomenon or to achieve new insights into it.
2. To portray accurately the characteristics of a particular individual, situation or a group.
3. To determine the frequency with which something occurs or with which it is associated with something else.
4. To test a hypothesis of a causal relationship between variables.

## □ Types Of Research:

Types of research can be classified in many different ways. some major ways of classifying research include the following:

- ➔ Descriptive versus Analytical Research
- ➔ Applied versus Fundamental Research
- ➔ Qualitative versus Quantitative Research
- ➔ Conceptual versus Empirical Research

# Research Approaches:

The types of research brings to light the fact that there are two basic approaches to research viz., quantitative approach and the qualitative approach.

➔ **Quantitative Approach:** Quantitative analysis in a formal and rigid fashion. Further sub-classified into inferential, experimental simulation.

➔ **Qualitative Approach:** Qualitative approach to research is concerned with subjective assessment of attitudes, opinion and behaviour. Generally, the techniques of focus group interviews, projective techniques and depth interviews are used.

# Research Methods versus Methodology:

It seems appropriate at this juncture to explain the difference between research methods and research methodology.

## Research methods:

Research methods may be understood as all those techniques that are used for conduction of research. These methods use in performing research operations.

**Research methods can be put into the following three groups :**

1. In the first group we include those methods which are concerned with the of data. These methods will be used where the data already available are not sufficient to arrive at the required solution;
2. The second group consists of those statistical techniques which are used for establishing relationships between the data and the unknowns;
3. The third group consists of those methods which are used to evaluate the accuracy of the results obtained.

These various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them.

# Research methodology:

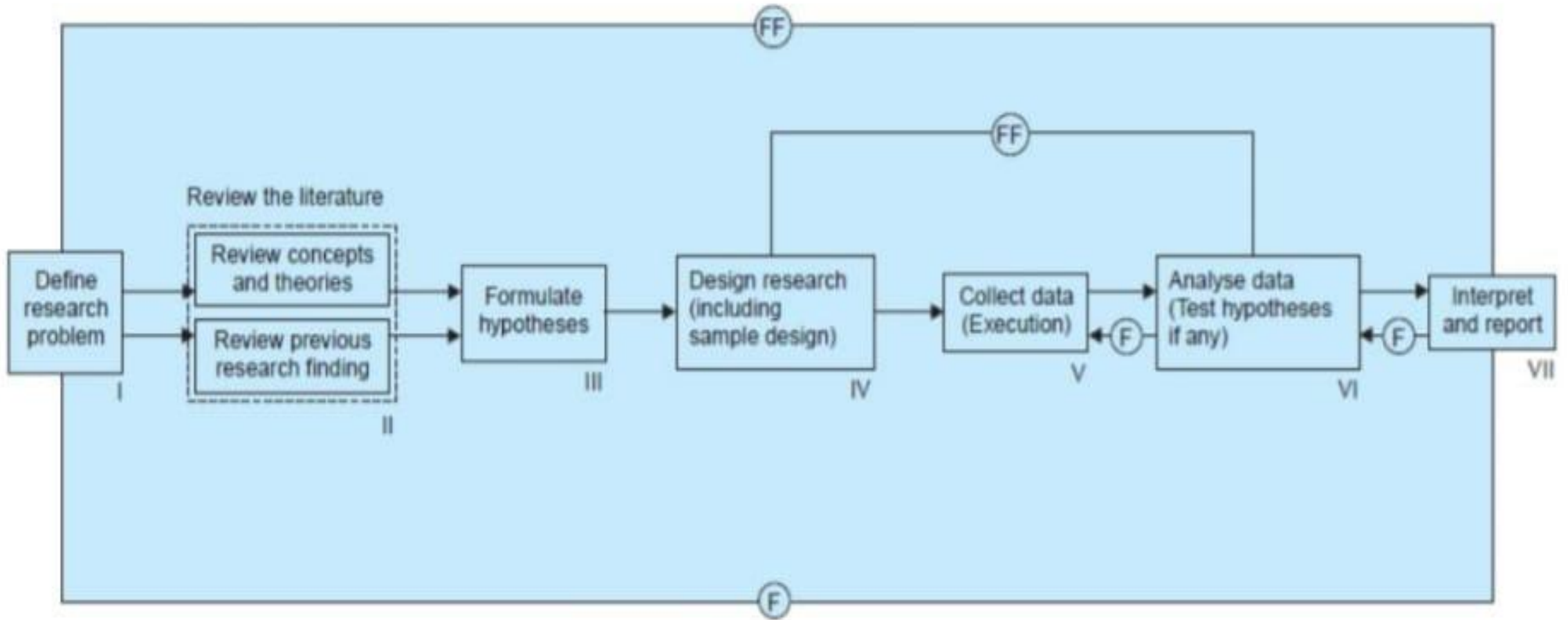
we can say that research methodology has many dimension and research methods do constitute a part of the research methodology.

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.

## 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 well illustrates a research process. The chart indicates that the research process consists of a number of closely related activities, as shown through I to VII. But such activities overlap continuously rather than following a strictly prescribed sequence.



Where (F) = feed back (Helps in controlling the sub-system to which it is transmitted)  
 (FF) = feed forward (Serves the vital function of providing criteria for evaluation)

## Research process:-

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.

## ★ 1. Formulating the research problem:

formulation of the problem often follows a sequential pattern where a number of formulations are set up, each formulation more specific than the preceding one, each one phrased in more analytical terms, and each more realistic in terms of the available data and resources.

There are two types of research problems those which relate to states of nature and those which relate to relationships between variables.

## ★ 2. Extensive literature survey:

Once the problem is formulated, a brief summary of it should be written down. 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 and should be carefully studied. A good library will be a great help to the researcher at this stage.

## ★ 3. 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. As such the manner in which research hypotheses are developed is particularly important since they provide the focal point for research.

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.

## ★ 4. Preparing the research design:

The research problem having been formulated in clear cut terms, the researcher will be required to prepare a research design, i.e., he will have to state the conceptual structure within which research would be conducted. The preparation of such a design facilitates research to be as efficient as possible yielding maximal information.

Research purposes may be grouped into four categories,

- I . Exploration
- ii . Description
- iii . Diagnosis
- iv . Experimentation.

The preparation of the research design, appropriate for a particular research problem, involves usually the consideration of the following:

- I . The means of obtaining the information;
- ii . The availability and skills of the researcher and his staff (if any);
- iii . Explanation of the way in which selected means of obtaining information will be organized and the reasoning leading to the selection;
- iv . The time available for research; and
- v . The cost factor relating to research, i.e., the finance available for the purpose.

## ★ 5. Determining sample design:

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 important sample designs is as follows:

- a). Deliberate sampling
- b). Simple random sampling
- c). Systematic sampling
- d). Stratified sampling
- e). Quota sampling
- f). Cluster sampling and area sampling
- g). Multi-stage sampling
- h). Sequential sampling

## ★ 6. Collecting the data:

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.

But in the case of a survey, data can be collected by any one or more of the following ways:

- i) . By observation
- ii) .Through personal interview:
- iii) .Through telephone interviews:
- iv) . By mailing of questionnaires:
- v) . Through schedules:

## ★ 7. 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.

## ★ 8. 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.

## ★ 9. 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.

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.

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.

## ★ 10. 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.

# ★ 11. 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: The layout of the report should be as follows:

- i). The preliminary pages:-** In its preliminary pages the report should carry title and date followed by acknowledgement 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.
- ii). The main text:-** The main text of the report should have the following parts:
  - a).Introduction:-** It should contain a clear statement.
  - b).Summary of findings:-** A statement of finding and recommendations in non-technical language.
  - c).Main report:-** This should be presented in logical sequence and broken-down into readily identifiable sections.
  - d).Conclusion:-** Towards the end of the main text, research should again put down the results of his research clearly and precisely. It is the final summing up.
- iii). The end matter:-** At the end of the report, appendices should be enlisted in respect of all technical data.

# Criteria of Good Research:-

Whatever may be the types of research and studies; one thing that is important is that they all meet on the common ground of scientific method employed by them.

## ➤ **Qualities of a good research:-**

- **Systematic**
- **Logical**
- **Empirical**
- **Replicable**
- **Creative**
- **Use of multiple methods.**

# Criteria Of Good Research:-

1. **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
2. **Good research is logical:** Research is guided by the rules of logical reasoning
3. **Good research is empirical:** 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
4. **Good research is replicable:** This characteristic allows research results to be verified by replicating the study and thereby building a sound basis for decisions.

# Problems In Research:-

- ❖ Uncontrollable variables
- ❑ Not similar to science
- ❖ Human tendencies
- ❑ Time and money
- ❖ Lack of computerization
- ❑ Lack of scientific training in the methodology of research
- ❖ Insufficient interaction between university research departments and business establishments
- ❑ Lack of code of conduct
- ❖ Difficulty of adequate and timely secretarial assistance
- ❑ Poor library management and functioning
- ❖ Difficulty of timely availability of published data
- ❑ Ignorance
- ❖ Research for the sake of research - limited practical utility through they may use high sounding business jargon.

## ❖ Techniques Involved in Defining a Problem:

Defining a problem is a herculean task, and this must be done intelligently to avoid confusions that arise in the research operation.

Try to follow the below steps systematically to best define a problem:

- ▶ State the problem in a general way
- ▶ Understand the nature of the problem
- ▶ Survey the available literature
- ▶ Go for discussions for developing ideas
- ▶ Rephrase the research problem into a working proposition: