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6. Steps Involved in Research Process

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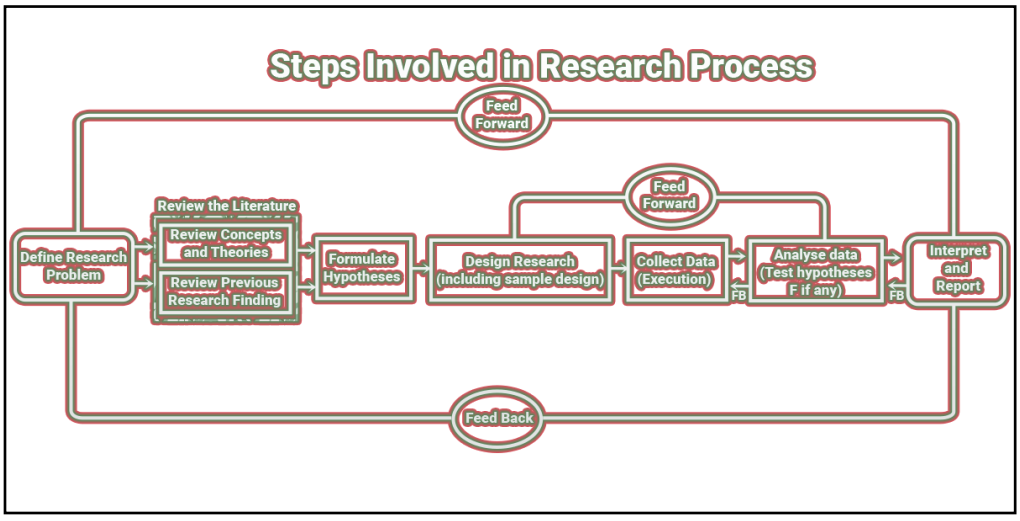
6.1 Introduction:

The research process incorporates a series of steps to be followed for completing the research. All the steps usually are followed in a sequence starting from problem to be studied to review of literature uptill the preparation of report. These steps are exclusively mentioned while writing the report but they may merge in one another while the research process is followed. One should remember that the various steps involved in a research process are not mutually exclusive, nor they are studied one after the other. Separate and distinct.

Every step is the outcome of the previous step and while studing each step one may not be sure of where it may lead to. Every step is anticipatory. However, the following standard order of the various steps are pointed below in the model depicting steps involved in research process.



A. Research Problem Formulation: Research usually starts with a problem which researcher wants to study. They depict some gap in knowledge which has to be filled through the new research to be studied. This knowledge gap may relate to nature of the concept which poses a question or it may be related to assessing comparative relation between various concepts. Thus usually two types of research problems erupt, viz., those which relate to nature of variables to be studied and those which relate to relationships between variables.

First step to understand the problem to be studied is by consulting experts in those areas, discussing with experienced persons and if one has a guide one may discuss with the guide for gaining more clear view about the problem to study Often, the guide puts forth the problem in generalized terms and it is up to the researcher to pick up specific aspects from the generalized version and further study using empirical approach or operational approach. In private business units or in governmental organizations', the problem is usually earmarked to the related department with which the problem is concerned so that the researcher may discuss with the concerned Departmental head, who is an experienced person about background of the problem and how he may go about doing the research steps.

B. Extensive Literature Survey: A problem which researcher plans to study emerges from a lot of work done in the past related to the concern taken up. One should search for theoretical base as that is responsible for various factual information which one desires to study. Those factual data must have been studied from various angles by other researchers, all this comes in review of literature. This is the background against which the problem one plans to study reveals itself. This problem highlights the gaps still existing in the topic one is studying. Once the problem is chalked out a tentative plan of action may be identified. All this one presents as synopsis in front of the research committee which after studying and understanding one's topic, gaps planned for study, may decide whether there is anything unique in his research or it is not worth studying. Hence elaborate review of literature is demanded this is essential because lot of time is spent in research study and if the wrong topic is taken up than it will be a waste of researcher's efforts. Search of various books, Academic journals, annual reports, conference proceeding are essential for understanding the problem and how to study, etc. In this process, it should be remembered that one source will lead to another. A good library will be a great help to the researcher at this stage.

C. Construction of Working Hypotheses: On the basis of review of literature gaps in the research topic are highlighted. They lead us to the problem to be studied and how it has to be studied. Predictions are made which would be tested in the research. That leads us to the formulation of working hypotheses. These will give ideas about what aspects of the concept have to be researched and the direction in which these will be studied. Hypothses depict the relationships which will be studied in the research study or the impact which the independent variable will have on dependent variables. Working hypothesis is a predictive statement about the rationalized relationship which may become the outcome of the study. This give direction to the study. They also direct the roadmap for which dimensions will lead to what outcomes, what will be a comparative relation between various variables, etc. the major aspects of the study will be worked upon based on the hypotheses to be tested. This will also focus on sample to be studied, the way they will be incorporated in the study in order to make it possible to analyse the data rightly to prove the gaps which we are studying as significant or not. The development of the working hypothesis plays an important role in guiding researchers towards the outcomes predicted. Hypothesis should not be a general statements but it should specify the relationship or impact of the various variables which are assumed to be the outcomes which are predicted. Hypotheses should be limited to the variables in consideration as part of the research study. Hypotheses acts as a guide to the researcher by narrowing them down to the purpose for which they have been stated. One's cognitions are acutely directed in the direction towards the data analysis and ultimately to findings which may prove that the research study was serving the purpose for which it is being conducted.

D. Research Design formulation: After the research concept is decided upon, gap identified to be studied related to the problem, the researcher has to prepare a proper design for moving further in the right research direction. The research problem having been formulated in clear cut terms, the researcher will be required to prepare a research design. The preparation of the research design, appropriate for a particular research problem, involves usually the consideration of the following:

It is a model plan specifying the methods and procedures to be applied for data collection, editing and categorizing the collected data, conducting preliminary analysis, on the basis of the results found applying higher level analysis for clear cut testing of all the dimensions of the topic being studied, this will clarify the significance of the findings for assessing the gap studied.

This will be based on the method used for obtaining data and the expertise of the researcher. There are four basic research designs that a researcher can use to conduct his or her study;

a. Survey Method,
b. Experimental Method,
c. Subjective/Secondary data study, and
d. Observational Approach.

The type of research design to be chosen from among the above four designs depends primarily on four factors:

- The type of gap observed in the problem
- The objectives set in the study,
- The Research gap between present problem and what is predicted for future knowledge achievement.
- The time and finance required for study is available.

The selected method will be rationalized for its application, it's organization and further testing in future. Next aspect influencing selection of research design is the duration required for research completion and the finance required for doing it.

E. Determining Sample Design: The researcher must decide the way of selecting a sample of 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. These methods are basically of two types: probability sampling and non-probability sampling. Probability sampling ensures every unit of the population being may have a chance of being selected in the sample and being studied. Random method is used to collect data.

If the whole population is to be studied than anyone may be included in the sample, than a non-probability sampling method may be employed. This decision is based on researcher's ease of data collection and this is his choice based on what he wants to do. This approach is variously called judgment sampling, convenience sampling, accidental sampling, and purposive sampling.

The most widely used probability **sampling methods are simple random sampling, stratified random sampling, cluster sampling,** and **systematic sampling.** They have been classified by their representation basis and unit selection techniques.

Two other variations of the sampling methods that are in great use are **multistage sampling** and **probability proportional to size (PPS) sampling.**

Multistage sampling is most commonly used in drawing samples from very large and diverse populations. They may also be the steps of data collection and their findings respectively stage wise. The PPS sampling is a variation on multistage sampling in which the various units to be studied are selected on some criteria and then from each unit some percent of sample is selected as sample, example if we study two villages to differentiate than we may take 10%of sample from each village population, or if this is not feasible than a sample of 200 persons from each sampling areas are selected for data collection..

F. Collecting Data: The approach for data collection depends upon the objectives of the research study, the research design selected and the duration, finance and data collection skill. Based on all these aspects data may be accumulated by observation method, questionnaire method, or large scale survey. There are many ways of data collection, but will be governed by limiting factors mentioned above. Based on the type of data to be collected, i.e. qualitative or quantitative method the way of data collection is used.

The most prevalent method for collecting quantitative data is by self-administered questionnaires or structured interview methods. In present time telephonic interviews, questionnaires in Google forms are also used. These can easily be administered through internet usage and be reachable nationally and also internationally. The secondary data may be taken from such sources like census, official documents, past records, etc.

Qualitative data are collected mainly through **in-depth interviews, focus group discussions, KII,** and observational studies.

G. Data analysis: After Data collection, data is processed. Editing is done to check mistakes and to delete aspects which are useless. Next coding manual is prepared to decide how every data processing will be labeled, the whole data collected is put in orderly manner via coding before data is analysed. Data are edited to ensure consistency across respondents and to locate omissions, if any. Alphanumeric codes are used to reduce the responses to a more manageable form for storage and future processing. It is impractical to use raw data without putting it in appropriate order. Data analysis usually involves using statistical tools like SPSS or AMOS for analyzing the data collected and testing the significance of results with hypotheses made in the study. Further, the researcher, based on his analysis, determines if his findings are consistent with the formulated hypotheses and theories.

The techniques to be used in analyzing data may range from simple descriptive analysis till higher level multivariate analysis depending upon the objectives of the study. As in the case of methods of data collection, an analytical technique appropriate in one situation may not be appropriate for another. One should apply only that statistical method needed for testing the questions raised in the study.

H. Generalizations and Interpretation: After data analysis we check the findings with other researchers. If the research finding is also found by other research on this topic than generalizations may be drawn and they may contribute to emergence of a new theoretical base. This is generalization.

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.

This chapter imparts the eight steps which are included in the research process. All who conduct research or project work should use these standard steps for completing the research study correctly and coming up with findings which serve the purpose of the project or research study.

6.2 References:

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