

Research process consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps. 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.

1. Formulating the Research Problem

A **research problem**, in general, refers to some difficulty which a researcher experiences in the context of either a theoretical or practical situation and wants to obtain a solution for the same. Thus, a **research problem** requires a researcher to find out the best solution by which cause of action the objective can be attained optimally in the context of a given environment. This stage requires an enquiring mind, an imagination, and an eye for inconsistencies and inadequacies in current measure. It is often useful in identifying a specific problem (Kothari 1990; Walliman, 2001). This initial stage in research requires an awareness of current issues in the subject and inquisitiveness and questioning mind. On this point, Walliman (2001: 22) suggests a list of features that one should follow and look for it in order to obtain a research problem. This list concerns the following ideas:

ÉThe research problem should be a great interest to you.

ÉThe research problem should be significant.

ÉThe research problem should be delineated.

ÉThe researcher should be able to obtain the information required.

ÉThe researcher should be able to draw conclusions related to the problem.

ÉThe researcher should be able to state the problem clearly and concisely.

The **research problem** undertaken for study must be carefully selected. The factors which need to be considered in the selection of a **research problem** are both external and internal criteria. External criteria have to do with matters, such as novelty, and importance for the field. Internal criteria, on the other side, involve considerations as interest, training, cost, and time. According to Good and Scates cited in Singh (2006), the criteria for the selection of the problem include matters, such as:

ÉNovelty and avoidance of unnecessary duplication.

ÉInterest, intellectual curiosity and drive.

ÉTraining and personal qualifications.

- ÉImportance for the field.
- ÉSpecial working conditions.
- ÉApproachability of the sample.
- ÉCost.
- ÉAdministrative cooperation.
- ÉTime factor.

To select a **research problem**, a researcher can consider some sources as:

- ÉPersonal experience of the researcher in the field.
- ÉLiterature review on a research topic.
- ÉNew innovations, changes, and developments in a given research area.
- ÉResearch contacts with experts in a given research area.

For Singh (2006), to define a problem means to pinpoint the problem or defining a problem to reach the core of a problem i.e., threads are analyses. Defining a **research problem** serves the following purposes:

- Ésets the direction of the study,
- Éreveals the methodology or procedure of the study,
- Éhelps the researcher to control subjectivity,
- É suggests and specifies the variables to be taken up into the investigation through a problem involved in so many variables,
- Émakes the research work practical.

In order to define a **research problem**:

- ÉThe words used should have a single meaning,
- ÉThe statement of the problem must be brief but comprehensive.
- ÉThe assumptions are to be recognised for the study.
- ÉThe problem should have practical importance in the field.
- ÉThe definition or statement of the problem should have certain rationale.

The following steps are to be followed in defining a **research problem**:

- ÉThe researcher should develop a conceptual framework of the problem.

ÉDelimiting the elements of the problem.

ÉClassifying the elements in the homogeneous group.

ÉLocating the key-concepts in the conceptual framework.

ÉEvaluating the theoretical security of the problem.

ÉThe final form of the statement can be given into verbal form to a conceptual framework of the problem.

ÉDeciding the practical difficulty in conducting the study (ibid, p.27).

After selecting a problem, it should be stated carefully, Kerling (cited in Singh, ibid) has identified three criteria of a good problem statement. These mainly concern:

ÉA problem should be concerned with relation between two or more variables.

ÉIt should be stated 'clearly and unambiguously in right form'

ÉIt should be amenable to testing (p.29).

2. The Review of Literature

The term 'review' means to organise the knowledge of the specific area of research to evolve an edifice of knowledge to show that this study would be an addition to this field. The task of review of literature is highly creative and tedious because the research has to synthesise the available knowledge of the field in a unique way to provide the rationale for his/her study (Singh, 2006, p. 35).

According to J. W. Best, 'Practically all human knowledge can be found in books and libraries. Unlike other animals that must start a new with each generation, man builds upon the accumulated and recorded knowledge of the past. His constant adding to the vast store of knowledge makes possible progress in all areas of human endeavour'. **Reviewing the literature** has two phases. The first phase includes identifying all the relevant published material in the problem area and reading that part of it with which we are not thoroughly familiar. The second phase of the review of literature involves writing this foundation of ideas into a section of the research report. For the researcher, it establishes the background in the field. For the readers, it provides a summary of thinking and research necessary for them to understand the study (ibid).

The **review of literature** is essential due to the following:

ÉOne of the early steps in planning a research work is to review a research done previously in the particular area of interest.

ÉIt is very essential for every researcher to be up-to-date in his/her information about the literature related to his/her own problem already done by others.

ÉIt avoids the replication of the study of findings to take an advantage from similar or related literature.

ÉIt provides as source of problem of study.

The **review of literature** serves the following purposes in conducting research work:

ÉIt provides theories, ideas, explanations or hypotheses which may prove useful in the formulation of a new problem.

ÉIt avoids replication when it indicates whether the evidence already available solves the problem adequately without requiring further investigation.

ÉIt provides the sources for hypothesis. The researcher can formulate research hypothesis on the basis of available studies.

ÉIt suggests method, procedure, sources of data appropriate to the solution of the problem.

ÉThe conclusions drawn in the related studies may be significantly compared and maybe used as the subject for the findings of the study.

To conduct the **review of literature**, the researcher should go through these stages:

Stage 1: Try to gain some impression of what the source is about; what a question or questions the author is trying to answer; how the source is structured, and whether, in fact, the questions tackled and the answers put forward are relevant to your needs.

Stage 2: If you decide that the source is relevant to your research subject, then you must formulate the question or questions you anticipate will be answered in the source. This enables you to locate the required information and will save you time and effort as you cannot afford to go reading aimlessly through the source. At this stage, you must adopt an active and analytical attitude.

Stage 3: After formulating the main question or questions that you anticipate the source will answer, you must review the source to look for answer for your questions. This involves locating the parts of the source where your questions are dealt with. You must then look for the answers or conclusions that the author has drawn, and also at how the author arrived at them.

Stage 4: Supposing that you have extracted the relevant information from the written report, you must now record your data in note form, so that later you can retrieved it and use it easily at the appropriate stage (Walliman, 2001).

The reporting **review of literature** makes the research study very specific and up-to-date. The researcher should try to relate the collected research studies with his/her own study; and show that his/her study is a derivation from the other studies.

3. The Development of Hypotheses

The term **hypothesis** has been defined in several ways. According to G. J. Mouly, a hypothesis is an assumption or proposition whose testability is to be tested on the basis of the computability of its implications with empirical evidence with previous knowledge.

In fact, these are the main features of a hypothesis:

ÉIt is conceptual in nature.

ÉIt is a verbal statement in declarative form.

ÉIt indicates the tentative relationship between two or more variables.

ÉIt has a future or forward reference. It relates to the future verification not to the past facts and information.

ÉIt is the pivot of a scientific research. All the research activities are design for its verification.

ÉThe nature of hypothesis can be well understood by differentiating it with other terms like assumption and postulate.

The following are the main functions of a hypothesis:

ÉIt is a temporary solution of a problem concerning with some truth which enables a researcher to start his/her research work.

ÉIt may provide possible solutions to the problem.

ÉEach hypothesis may lead to formulate another hypothesis.

ÉEach hypothesis provides the researcher with definite statement which may be objectively tested and accepted or rejected and leads for interpreting results and drawing conclusions that is related to the original purpose.

Research methodologists advocate the importance of hypothesis in the following ways:

ÉHypotheses are indispensable in research because they build bridge between the problem and evidence that may solve the problem.

ÉA hypothesis provides the map that guides and expedites the investigation of the phenomena under consideration.

ÉA hypothesis directs the researcher's efforts into productive channels.

ÉA hypothesis may suggest what subjects, tools, and instruments are needed.

ÉA hypothesis provides the framework for drawing conclusions.

There are four kinds of hypotheses. These are: (1) Question (2) Declaration statement, (3) Directional statement, (4) Null form or Non-directional.

1. Question form Hypotheses: Some writers assert that the hypothesis may be stated as a question. However, there is no consensus on this view.

2. Declarative Statement: A hypothesis may be developed as a declarative which can provide an anticipated relationship between variables or differences between variables.

3. Directional Hypothesis: A hypothesis may be directional which connotes an expected direction in the relationship or difference between variables.

4. Non-directional hypothesis: A hypothesis may be stated in the null form which is an assertion that no difference exists between or among the variables.

A good hypothesis must possess the following characteristics:

1. A good hypothesis is in agreement with the observed facts.

2. A good hypothesis does not conflict with any law of nature which is known to be true.

3. A good hypothesis is stated in the simplest possible terms.

4. A good hypothesis permits the application of deductive reasoning.

5. A good hypothesis ensures that the methods of verification are under control of the researcher.

6. A good hypothesis guarantees that the available tools and techniques will be effectively used for the purpose of verification.

7. A good hypothesis ensures that the sample is readily approachable.

8. A good hypothesis indicates clearly the role of different variables involved in the study.

9. A good hypothesis maintains a very apparent distinction with what is called theory, law, facts, assumptions, and postulate.

To formulate a hypothesis, researchers use induction and deduction. Hypothesis construction enables researchers to generalise their findings beyond the specific conditions which they have obtained. Since a hypothesis is a formulation of anticipated findings, researchers are advised to develop a hypothesis as a means of demonstrating the basis for their study to themselves and their audience. The task of introducing a study and discussing the findings are facilitated by the existence of a hypothesis.

4. Preparing the Research Design

Before starting a research, the investigator will look for a problem; he will read books, journals, research reports and other related literature. Based on this, he will finalize the topic for research. Research design is a structure with in

which research is conducted. It constitutes the blue print for the collection, measurement and analysis of data. According to Gay and Airasian (2000), "A design is general strategy for conducting a research study. The nature of the hypothesis, the variables involved, and the constraints of the real world all contribute to the selection of design."

Thus, it can be said that research design is an outline of what the researcher will do from writing of objectives, hypotheses and its operational implications to find analysis of data. Research design should be able to convey the following:

• What is the study about?

• Where will study be carried out?

• What type of data is necessary?

• Where necessary data is available?

• How much time is needed to complete the study?

• What will be the sampling design?

• Which tools will be identified to collect data?

• How data will be analysed?

From the purposes of a research design is that:

• It helps the investigator to obtain answers to research problem and issues involved in the research, since it is the outline of entire research process.

• It tells the researcher about how to collect data, what observation are to be carry out, how to make them, how to analyse the data.

• It guides the investigator about statistical techniques to be used for analysis.

• It also guides him to control certain variables in experimental research.

Thus, a research design guides the investigator to carry out research step by step in an efficient way. The design section is said to be complete / adequate if investigator can carry out his research by following the steps described in design.

Research design is needed because it facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money. Just as for better, economical and attractive construction of a house, we need a blueprint (or what is commonly called the map of the house) well thought

out and prepared by an expert architect, similarly we need a research design or a plan in advance of data collection and analysis for our research project.

Research design stands for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in their analysis, keeping in view the objective of the research and the availability of staff, time and money. Research design, in fact, has a great bearing on the reliability of the results arrived at and as such constitutes the firm foundation of the entire edifice of the research work.

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.

A good **research design**:

Is often characterized by adjectives like flexible, appropriate, efficient, economical and so on.

Minimizes bias and maximizes the reliability of the data collected and analyzed.

Gives the smallest experimental error

Yields maximal information and provides an opportunity for considering many different aspects of a problem.

Thus, the question of good design is related to the purpose or objective of the research problem and also with the nature of the problem to be studied.

5. Determining Sample Design

Sampling is an indispensable technique in social sciences research. A research work cannot be undertaken without the use of sampling. The study of the total population is not possible and it is impracticable. The practical limitation cost, time, and other factors which are usually operative in the situation, stand in the way of studying the total population. The concept of **sampling** has been introduced with a view to make the research findings economical and accurate (Singh, 2006). Cothari C. R. defines a **sample** as: "the technique or the procedure the researcher would adopt in selecting items for the

sample. **Sample design** may as well lay down the number of items to be included in the sample i.e., the size of the sample (1980, p.56).

Research work is guided by inductive thinking. The researcher proceeds from specificity to generality. The sample observation is the specific situation, which is applied to population. The **sampling** is the fundamental to all the statistical techniques and analysis. The measures of a sample are known as statistics and measures of a population. The accuracy of the measures depends on sample representativeness. In research work, generalization is made by estimating measures on the basis of the sample.

In social sciences, two methods to **sampling** are used: (a) Probability Sampling and (b) Non-probability Sampling. In general, with probability sampling, all elements (eg., persons, households) in the population have some opportunity of being included in the sample, and the mathematical probability that any one of them will be selected can be calculated. With non-probability sampling, in contrast, population elements are selected on the basis of their availability because they are volunteered, or because of the researcher personal judgment that they are representative. The consequence is that an unknown portion of the population is excluded (eg., Those who did not volunteer). Specifically, these two methods (types) can be categorized as follows:

(a) Probability (random) Samples

É Simple random sample

É Systematic random sample

É Stratified random sample

É Multistage sample

É Cluster sample.

(b) Non-probability samples

É Convenience sample

É Purposive sample

É Quota sample

The following are the main characteristics of a **good sample**:

1. A good sample is the true representative of the population corresponding to its properties.

2. A good sample is free from bias.

3. A good sample is an objective one.
4. A good sample is comprehensive in nature.
5. A good sample maintains accuracy.
6. A good sample is economical from energy, time and money.
7. The subjects of a good sample are easily approachable.
8. The size of a good sample is such that it yields accurate results.
9. A good sample makes the research work more feasible.
10. A good sample has the practicability for research situation (Singh, 2006).

The **size of the sample** often depends on the researcher's precision to estimate the population parameter at a particular level. However, it is clear that there is no clear rule to determine the size of the sample. The best answer to the question of size is to use a large sample. A larger sample is likely to be much more representative of the population. Furthermore, with a large sample, the data can be more accurate and precise. It was pointed out that in that the larger the sample, the smaller the standard error (ibid).

6. Collecting the Data

1. Questionnaires

Questionnaires are written instruments that present respondents with a series of questions or statements to which they are to react either by writing out their answers or selecting from among existing answers (Brown, 2001). This data collection method is a useful instrument not only for collecting information, but also for providing respondents with structured, often numerical and analyzing data in a straightforward way (Wilson, Mclean, 1994).

To develop a questionnaire, a researcher should follow some stages:

1. Develop a chart technique to plan the sequences of questions;
2. Take general purpose or a set of specific purposes and draw them into concrete fields;
3. Identify and itemize subsidiary topics related to the central purpose; and
4. Formulate information related to the different researched issues.

In terms of types of questionnaires, in particular, these concern mainly:

1. Structured Questionnaires;
2. Unstructured questionnaires; and
3. Semi-structured questionnaires.

The advantages of questionnaires can be stated in the following:

- (a) They can supply considerable amount of research data for relatively low cost in terms of time, money, and materials;
- (b) They are simple and easy to administer;
- (c) They provide standardized answers; and
- (d) They allow the speedy collection and analysis of data.

2. Interviews

An interview marks a move from seeing subjects as easily manipulated and data as somehow external to individuals that are usually expected to generate knowledge often through conversation (Kvale,1996). For Rapley (2004), an interview is a social encounter where speakers collaborate in producing retrospective and prospective accounts of a version of their part (future), actions, experiences, feelings, and thoughts (cited in Hoadjli, 2015).

In terms of types of interviews, in particular, these concern mainly:

1. Structured interviews;
2. Unstructured interviews; and
3. Semi-structured interviews.

The advantages of interviews can be stated in the following:

- (a) They are particularly good at producing data which deal with topics in in-depth and detail;
- (b) They require simple equipment, and are built on conversation skills;
- (c) They are flexible; and
- (d) They allow direct contact.

3. Focus Groups

A focus group is a research method used to collect data through a group interaction on a topic determined in advance by a researcher, Dörnyei (2007) recognizes that focus groups are sometimes treated as a sub-type of interviewing because both the format and the interviewer's role considerably resemble to some extent to what is taken part in the interviewing process. Cohen et. al., (2005) join this view. They add that two groups are a form of group interviewing, though not in the sense of backward and forward between interviewer and group. Rather, the reliance is on interaction with the group that discusses the topic supplied by the researcher. Hence, the participants interact with each other rather with the interviewer, such that the views of the participants can emerge the participants' rather than the researcher's agenda can predominate (Hoadjli, 2015).

In focus groups, some basic characteristics need to consider. These are:

Size: The size of a focus group has to range between 6-10 (sometimes 12) people.

Composition: focus groups work better with homogeneous samples.

Parallel focus groups: The standard practice is to run several focus groups in one research project.

The advantages of focus groups can be stated in the following:

Orientation to a particular field of forms;

É Developing themes, topics, schedules for subsequent interviews and/or questionnaires.

É Generating hypotheses that derive from the insights and from the group;

É Generating and evaluating data from different sub-groups of a population; and Gathering feedback from previous studies (Morgan,1988; cited in Hoadjli, 2015).

4. Observation

Observation is a data collection method which often offers the researcher the opportunity to gather -live dataø from the -situationsø It enables the researcher to understand the content, to be open-ended and inductive, to see things that might otherwise be consciously missed, to discover things that participants might not freely talk about in interview situations, to move beyond perception-based data, and to access personal knowledge (Cohen et al., 2005). For Denscombe (2010), observation does not rely on what people say they do, or what they say they think. It is more straightforward than this. It is based on the premise that, for certain purposes, it is best to observe what actually happens.

To carry out an observation, the researcher should provide an observation framework. This procedure enables the researcher to realize these purposes:

É Be alert on the same activities and be looking out for the same things;

É Record data systematically; and

É Produce data which are consistent between observers.

The advantages of observation can be stated in the following:

É It allows researchers to see directly what people do without having to rely on what they say to do.

É It gives descriptive contextual information about the setting of the researched phenomenon.

É It provides answers to the problems associated with the selective perceptions of observers.

É It eliminates to some extent bias and subjectivity on the part of the observed people; and

É It gives a means to collect data in a relatively short time (Hoadjli,2015).

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. If the survey is to be conducted by means of structured questionnaires, data can be readily machine-processed. If the data are to be collected through interviewers, arrangements should be made for proper selection and training of the interviewers. In other words, steps should be taken to ensure that the survey is under statistical control so that the collected information is in accordance with the pre-defined standard of accuracy. If some of the respondents do not cooperate, some suitable methods should be designed to tackle this problem. One method of dealing with the non-response problem is to make a list of the non-respondents and take a small sub-sample of them, and then with the help of experts vigorous efforts can be made for securing response.

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. Editing is the procedure that improves the quality of the data for coding. With coding the stage is ready for tabulation which is a part of the technical procedure wherein the classified data are put in the form of tables. The mechanical devices can be made use of at this stage. 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.

Analysis work after tabulation is generally based on the computation of various percentages, coefficients, etc., by applying various well defined statistical formulae. In the process of analysis, relationships or differences supporting or conflicting with original or new hypotheses should be subjected to tests of significance to determine with what validity data can be said to indicate any conclusion(s). In brief, the researcher can analyze the collected data with the help of various statistical measures.

9. Hypothesis-testing

The evidence of the work of hypothesis lies in its abilities to meet test of its validity. The purpose of testing a hypothesis is to determine the probability that it is supported by fact. Because a hypothesis is a general expectation about the relationship between variables, there is an extremely large number of instances

under which it can be tested, and it would be impractical to attempt to gain support in all of these instances.

A hypothesis is never proved. It is merely sustained or rejected. If it fails to meet the test of its validity, it must be modified or rejected. The confirmation of a hypothesis, on the other hand, is always, a tentative and relative, subject to later revision and even rejection as further evidence appears or more adequate hypotheses are introduced.

10. Generalizations and Interpretation

If a hypothesis is tested and maintained 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.

11. Preparation of the Report or the Thesis

Finally, the researcher has to prepare the report of what has been done. Writing of report must be done with great care keeping in view the following:

1. The layout of the report should be as follows:

(i) The preliminary pages: the report should carry title and date followed by acknowledgements. 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 should be composed of 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.

(c) Main report: The main body of the report should be presented in logical sequence and divided 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.

(iii) The end matter: 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.

2. 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.

3. Charts and illustrations in the main report should be used only if they present the information more clearly and forcibly.

4. Calculated 'confidence limits' must be mentioned and the various constraints experienced in conducting research operations may as well be stated.