



*Department of
English Language and
Literature.*

Level: Master 2/ DiD

**Subject: Research
Methodology**



Sources and References

- Bryman, Alan. "The Research Question in Social Research: What is its Role?" *International Journal of Social Research Methodology* 10 (2007): 5-20.
- Nunan, D. (1991). *Language Teaching Methodology: Book for Teachers*. New York: Prentice Hall International.
- Nunan, D. (1992b). *Research methods in language learning*. Cambridge: Cambridge University Press
- Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New York: New Age International.
- Griffee, T. D. (2012). *An Introduction To Second Language Research Method*. USA: TESL-EJ Publications.
- Given, L. M. (Ed.). (2008). *The Sage encyclopedia of qualitative research methods*. California: Sage Publications.
- Dörnyei (2007). *Research Approaches in Applied Linguistics*. Oxford University Press. Retrieved from: https://www.academia.edu/32229515/Research_Methods_in_Applied_Linguistics
- Dörnyei, Z. (2007). *Research methods in applied linguistics: Quantitative, qualitative, and mixed methodologies*. Oxford: Oxford University Press.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education*. New York: Routledge.
- Kumar, R. (2011). *Research methodology: A step-by-step guide for beginners*. Los Angeles: SAGE.

Lesson One: What is a Research?

Definitions:

The word *research* is composed of two syllables, *re* and *search*. The dictionary defines the former as a prefix meaning again, anew or over again and the latter as a verb meaning to examine closely and carefully, to test and try, or to probe (Singh, 2006). Together they form a noun describing a careful, systematic, patient study and investigation in some field of knowledge, undertaken to establish facts or principles. (Grinnell 1993, p. 4)

- ✓ **The American Heritage College Dictionary** defined research as "scholarly or scientific investigation or inquiry" or as a verb "to study (something) thoroughly" (2000). Thus, in its most basic and simplest form, research is a way of finding out answers to questions.
- ✓ **The Advanced Learner's Dictionary of Current English** lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge."
- ✓ Burns (1997) defines research as 'a systematic investigation to find answers to a problem'.
- ✓ According to **Kerlinger (1986)**, 'scientific research is a systematic, controlled empirical and critical investigation of propositions about the presumed relationships about various phenomena'.
- ✓ According to **P.D. Leedy** "Research is the manner in which we solve knotty problems in an attempt to push back the frontiers of human ignorance. Research is ultimately a way of thinking. It is a way of looking at accumulated fact so that a collection of data speaks to the mind of the researcher".
- ✓ **Kothari (2004)** defines research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation.

In this respect, research is an organized scientific investigation to solve problems, test hypotheses, develop or invent new products. Research is systematic, because it follows certain steps that are logical in order. These steps are:

- Understanding the nature of problem to be studied and identifying the related area of knowledge.
- Reviewing literature to understand how others have approached or dealt with the problem.
- Collecting data in an organized and controlled manner so as to arrive at valid decisions.
- Analyzing data appropriate to the problem.
- Drawing conclusions and making generalizations.

From these definitions it is clear that research is a process for collecting, analysing 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**. (Kumar,2011).

Characteristics of a Good Research:

Singh (2006) states the qualities of a good research as under:

1. **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.

2. **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 premise. In fact, logical reasoning makes research more meaningful in the context of decision-making.

3. **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.

4. **Replicable:** This characteristic allows research results to be verified by replicating the study and thereby building a sound basis for decisions.

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 (Kothari, 2004). According to Kothari (2004), 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).

It also aims 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 (Collis & Hussey, 2003).

Although we engage in such process in our daily life, the difference between our casual day- to- day generalisation and the conclusions usually recognized as scientific method lies in the degree of **formality, rigorousness, verifiability and general validity** of the latter.

Significance of Research:

Kothari (2004) "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 organisation.
- ✓ 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, as an aid to economic policy, has gained added importance, both for government and business.
- ✓ Research provides the basis for nearly all government policies in our economic system.
- ✓ Research has its special significance in solving various operational and planning problems of business and industry.
- ✓ Research is equally important for social scientists in studying social relationships and in seeking answers to various social problems.

Thus, research is the fountain of knowledge for the sake of knowledge and an important source of providing guidelines for solving different business, governmental and social problems. It is a sort of formal training which enables one to understand the new developments in one's field in a better way.

Types of research

For Kumar (2011), the types of research can be looked at from three different perspectives.

1. *Applications* of the findings of the research study;
2. *Objectives* of the study;
3. *Mode of enquiry* used in conducting the study.

The classification of the types of a study based on these perspectives is *not* mutually exclusive: that is, a research study classified from the viewpoint of 'application' can also be classified from the perspectives of 'objectives' and 'enquiry mode' employed. For example, a research project may be classified as pure or applied research (from the perspective of application), as descriptive, correlational, explanatory or exploratory (from the perspective of objectives) and as qualitative or quantitative (from the perspective of the enquiry mode employed).

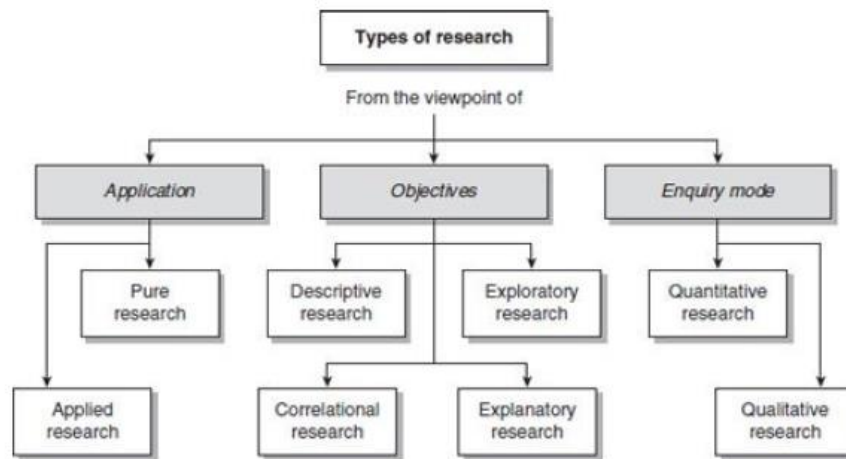


FIGURE 1.2 *Types of research*

Types of Research: Application Perspective	
Basic / Fundamental or Pure Research	Applied Research.
<p><i>Fundamental research</i> is mainly concerned with generalisations and with the formulation of a theory. "Gathering knowledge for knowledge's sake is termed 'pure' or 'basic' research." Kothari (2004) Pure research involves developing and testing theories and hypotheses that are intellectually challenging to the researcher but may or may not have practical application at the present time or in the future.</p>	<p>According to Kothari (2004) Applied research aims at finding a solution for an immediate problem facing a society or an industrial/business organisation. The research techniques, procedures and methods that form the body of research methodology are applied to the collection of information about various aspects of a situation, issue, problem or phenomenon so that the information gathered can be used in other ways - such as for policy formulation, administration and the enhancement of understanding of a phenomenon (Kumar,2011).</p>

Types of Research: Objectives Perspective			
Descriptive	Correlational	Explanatory	Exploratory
<p>Descriptive study attempts to describe systematically a situation, problem, phenomenon, service or programme, or provides information about, say, the living conditions of a community, or describes attitudes towards an issue. The main purpose of such studies is to describe what is prevalent with respect to the issue /problem under study. (Kumar,2011)</p>	<p>The main emphasis in a correlational study is to discover or establish the existence of a Relationship/association/interdependence between two or more aspects of a situation or phenomenon. (Kumar,2011)</p>	<p>Explanatory research attempts to clarify why and how there is a relationship between two aspects of a situation or phenomenon.</p>	<p>It is undertaken with the objective either to explore an area where little is known or to investigate the possibilities of undertaking a particular research study. When a study is carried out to determine its feasibility it is also called a feasibility study or a pilot study.</p>

Types of Research: Mode of Enquiry Perspective	
The Structured Approach; Quantitative Research	The Unstructured Approach. Qualitative Research.
<p>In the structured approach, everything that forms the research process - objectives, design, sample, and the questions that you plan to ask of respondents - is predetermined. The structured approach is more appropriate to determine the <i>extent</i> of a problem, issue or phenomenon.</p>	<p>The unstructured approach is predominantly used to explore its <i>nature</i>, in other words, variation/diversity per se in a phenomenon, issue, problem or attitude towards an issue. The unstructured approach allows flexibility in all aspects of the research process.</p>

Approaches of the Research:

The foremost aim of any research is to find answers to the research questions through the use of particular research approach. Actually, there are two primal approaches to research, *quantitative* approach and *qualitative* one.

Quantitative approach

The quantitative research aims at gathering numerical data which used to test a theory, quantify attitudes, views, and other variables. It is also based on structured data gathering methods such as survey, structured interview, systematic observation etc. According to Dörnyei (2007), "Quantitative research involves data collection procedures that result primarily in numerical data which is then analysed primarily by statistical methods. Typical example survey research using a questionnaire, analysed by statistical software such as SPSS" (p.24). In view of that, the quantitative research is based on the measurement of quantity. It is, then, applicable to the study of phenomenon that can be expressed in terms of numbers and statistics. As for Kothari

(2004), the quantitative approach can be also sub-classified into three main approaches:

- ✓ **Inferential approach:** Its aim is to form a database from which to infer characteristics or relationships of population.
- ✓ **Experimental approach:** In this approach, the researcher has to control over the research environment and manipulate the variables to observe their effect on other variables.
- ✓ **Simulation approach:** the purpose of this approach is to generate information and data through the construction of an artificial environment.

Qualitative approach

Qualitative approach is primarily considered as an exploratory research, which aims at gaining an in depth understanding of the phenomenon under investigation. This approach uses different methods of data gathering which are varied between unstructured and semi-structured strategies. It relies mainly on data in the form of texts. For Dörnyei (2007) "Qualitative research involves data collection procedures that result primarily in open ended, non-numerical data which is then analysed primarily by non- statistical methods. Typical example, interview research with transcribed recording analysed by qualitative content analysis" (p.24). Hence, in the qualitative approach, the focus is on using tools that collect non-numerical data, and then analysed without using statistical procedures. To put it in Kothari's words (2005):

Qualitative approach to research is concerned with subjective assessment of attitudes, opinions and behaviour. 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. (p.5)

Accordingly, the main aim of qualitative research is to investigate the qualitative aspects of human nature in order to describe, explain, predict and control behaviour. The following table shows the differences between qualitative and quantitative approaches in terms of purpose, design, approach, tools, sample and analysis.

Mixed -methods approach

An amalgam between the principles of qualitative and quantitative approaches has led to the emergence of a new research approach known as "***mixed methods***" or "***triangulation***". In effect, the aim behind such combination is to get complementary data, so that the analysis will not reflect only impressions or statistics. In this view, Dörnyei (2007) states that "I agree that qualitative and quantitative methods are not extremes but rather form a continuum" (p.25). It is unarguably true that to get accurate facts about a given phenomenon, we need to utilise manifold methods for collecting and interpreting data. Furthermore, Mackey and Gass (2005) claim that:

"The growing practice of utilizing qualitative and quantitative data illustrates the fact that these two research approaches should not be viewed as opposing poles in a dichotomy, but rather as complementary means of investigating the complex phenomena at work in second language acquisition". (p. 164)

Taking this argument further, Given (2008) points out that "the use of both qualitative and quantitative approaches will provide a more complete understanding of the research problem than either approach alone" (p. 527). On this basis, the first key advantage of employing mixed methods approach or triangulation is the "*completeness*".

Research Methods versus Methodology

Research methods may be understood as all those methods/techniques that are used for conduction of research. *Research methods or techniques**, thus, refer to the methods the researchers use in performing research operations. In other words, all those methods which are used by the researcher during the course of studying his research problem are termed as research methods. Research methods can be put into the following three groups:

1. In the first group we include those methods which are concerned with the **collection 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**.

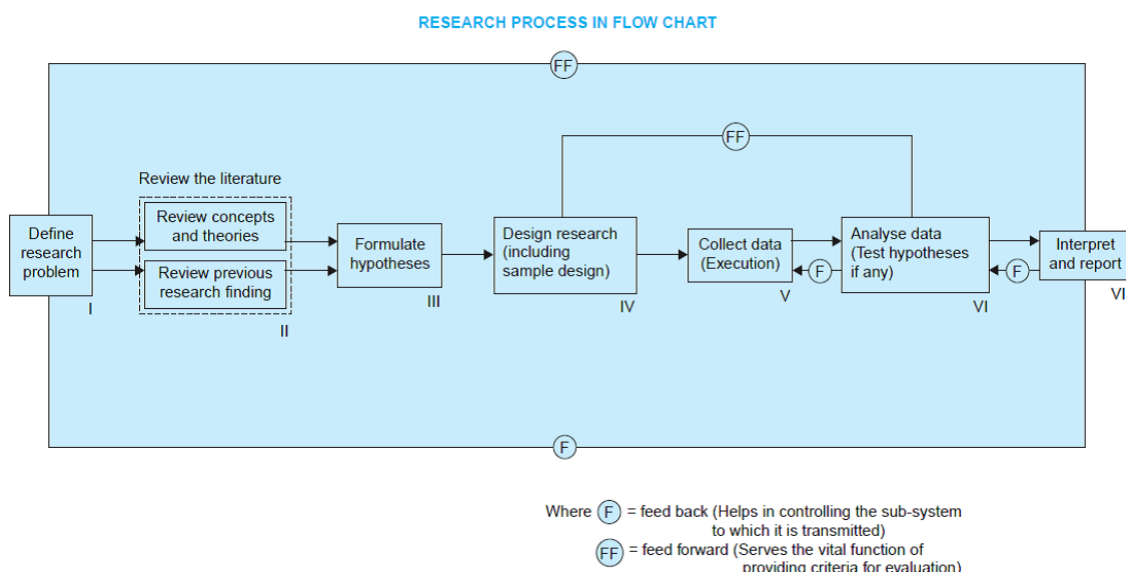
Research methods falling in the above stated last two groups are generally taken as the analytical tools of research.

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.

Lesson Two: 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 well illustrates a research process. The chart indicates that the research process consists of a number of closely related activities. 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 they are 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) generalisations and interpretation,
- (11) preparation of the report or presentation of the results, i.e., formal write-up of conclusions reached.



1. 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, 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. The best way of understanding the problem is to discuss it with one's own colleagues or with those having some expertise in the matter.

2. 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.

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. Hypothesis should be very specific and limited to the piece of research in hand because it has to be tested. The role of the hypothesis is:

- To guide the researcher by delimiting the area of research and to keep him on the right track.
- It sharpens his thinking and focuses attention on the more important facets of the problem.
- It also indicates the type of data required and the type of methods of data analysis to be used.

Actually, 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. Working hypotheses are more useful when stated in **precise and clearly defined terms**. It may as well be remembered that occasionally we may encounter a problem where we do not need working hypotheses, specially in the case of exploratory or formulative researches which do not aim at testing the hypothesis. But as a general rule, specification of working hypotheses in another basic step of the research process in most research problems.

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. In other words, the function of research design is to provide for **the collection of relevant evidence with minimal expenditure of effort, time and money**. The preparation of the research design, appropriate for a particular research problem, involves usually the consideration of the following:

- The means of obtaining the information;
- The availability and skills of the researcher and his staff (if any);
- Explanation of the way in which selected means of obtaining information will be organised and the reasoning leading to the selection;
- The time available for research; and
- 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. Thus, the plan to select 12 of a city's 200 drugstores in a certain way constitutes a sample design. Samples can be either probability samples or non-probability samples.

- With **probability samples** each element has a known probability of being included in the sample. Probability samples are those based on simple random sampling, systematic sampling, stratified sampling, cluster/area sampling
- The **nonprobability samples** do not allow the researcher to determine this probability. Nonprobability samples are those based on convenience sampling, judgement sampling and quota sampling techniques.

6. 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: **Observation, personal interview, telephone interviews, mailing of questionnaires, 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. 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.

8. Analysis of data:

After the data have been collected, the researcher turns to the task of analysing 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. The unwieldy data should necessarily be condensed into a few manageable groups and tables for further analysis. Thus, 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. **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).

9. Hypothesis-testing:

After analysing 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, Ftest, 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, generalisations established on the basis of data may be stated as hypotheses to be tested by subsequent researches in times to come.

10. Generalisations and interpretation:

If a hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at generalisation, i.e., to build a theory. As a matter of fact, the real value of research lies in its ability to arrive at certain generalisations. 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 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: Introduction, Summary of findings, Main report, Conclusion, Bibliography, Index.
- 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.
- Charts and illustrations in the main report should be used only if they present the information more clearly and forcibly.
- Calculated 'confidence limits' must be mentioned and the various constraints experienced in conducting research operations may as well be stated.

Lesson Three: Research Design

Meaning 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**”. Decisions regarding what, where, when, how much, by what means concerning an inquiry or a research study constitute a research design. According to Selltitz et.al., (1962) “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.”. (p. 50). In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. As such, the design includes an outline of what the researcher will do from writing the hypothesis and its operational implications to the final analysis of data. More explicitly, the design decisions happen to be in respect of:

- 1- What is the study about?
- 2- Why is the study being made?
- 3- Where will the study be carried out?
- 4- What type of data is required?
- 5- Where can the required data be found?
- 6- What periods of time will the study include?
- 7- What will be the sample design?
- 8- What techniques of data collection will be used?
- 9- How will the data be analysed?
- 10- 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:

- **The sampling design** which deals with the method of selecting items to be observed for the given study;
- **The observational design** which relates to the conditions under which the observations are to be made;
- **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 analysed;
- **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:

- It is a plan that specifies the sources and types of information relevant to the research problem.

- It is a strategy specifying which approach will be used for gathering and analysing the data.
- It also includes the time and cost budgets since most studies are done under these two constraints.

In brief, research design must, at least, contain:

- (a) A clear statement of the research problem;
- (b) Procedures and techniques to be used for gathering information;
- (c) The population to be studied; and
- (d) Methods to be used in processing and analysing data.

Lesson Four: Research Problem

Definition

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. (Singh,2006, p. 23). The identification and analysing a research problem is the first and most crucial step of research process. A problem cannot be solved effectively unless a researcher possesses the intellect and insight to isolate and understand the specific factors giving rise to the difficulty. In particular, some components that make-up a research problem can be examples like the ones that we state below:

- There must be an individual or a group which has some difficulty or the problem.
- There must be some objective (s) to be attained at. If one wants nothing, one cannot have a problem.
- There must be alternative means for obtaining the objective (s) one wishes to attain. This means that there must be at least two means available to a researcher for s/he has no choice of means, s/he cannot have a problem.
- There must remain some doubt in the mind of a researcher with a regard to the solution of alternatives. This means that research must answer the questions concerning the relative efficiency of the possible alternatives.
- There must be some environment (s) to which the difficulty pertains (Kothari, 1990).

Selecting the Problem

According to Kothari (2004), the following points may be observed by a researcher in selecting a research problem or a subject for research:

- Subject which is overdone should not be normally chosen, for it will be a difficult task to throw any new light in such a case.
- Controversial subject should not become the choice of an average researcher.
- Too narrow or too vague problems should be avoided.
- The subject selected for research should be familiar and feasible so that the related research material or sources of research are within one's reach.
- The importance of the subject, the qualifications and the training of a researcher, the costs involved, the time factor are few other criteria that must also be considered in selecting a problem.
- The selection of a problem must be preceded by a preliminary study. This may not be necessary when the problem requires the conduct of a research closely

similar to one that has already been done. But when the field of inquiry is relatively new and does not have available a set of well developed techniques, a brief feasibility study must always be undertaken.

Sources Of Problems

According to Singh (2006), the selection of a suitable problem is not an easy task. It is a serious responsibility to commit oneself to a problem that will inevitably require much time and energy and which is so academically significant. The following are the main sources to which one may proceed for a suitable research problem:

1. Personal experiences of the investigator in the field of education are the main source for identifying suitable problem.
2. The other source of problem which is most frequently used by the investigator as suggested by the supervisors, is the extensive study of available literature-research abstracts, journals, hand-books of research international abstracts etc.
3. In the choice of a suitable problem, the researcher has to decide his field of investigation. He should study the field intensively in the specific area, this may enable him to identify a problem from the specific field.
4. The new innovations, technological changes and curricular developments are constantly bringing new problems and new-opportunities for Social Studies Research.
5. The most practical source of problem is to consult supervisor, experts of the field and most experienced person of the field. They may suggest most significant problem of the area. He can discuss certain issues of the area to emerge a problem.
6. It is a general practice that researchers suggest some problems in their

According to Kumar (2011), most research in the humanities revolves around four Ps:

- people;
- problems;
- programmes;
- phenomena.

In fact, a closer look at any academic or occupational field will show that most research revolves around these four Ps. The emphasis on a particular 'P' may vary from study to study but generally, in practice, most research studies are based upon at least a combination of two Ps. Every research study has two aspects: the *people* provide you with the 'study population', whereas the other three Ps furnish the 'subject areas'. Your study population - individuals, groups and communities - is the *people* from whom the

information is collected. Your subject area is a *problem, programme* or *phenomenon* about which the information is collected.

Alternatively, research problems can be identified by reviewing recent literature, reports, or databases in your field. Often the section of "recommendations for the future studies" provided at the end of journal articles or doctoral dissertations suggest potential research problems. In addition, major reports and databases in the field may reveal findings or data-based facts that call for additional investigation or suggest potential issues to be addressed. Looking at what theories need to be tested is another opportunity to develop a research problem.

Steps in Formulating a Research Problem

The process of formulating a research problem consists of a number of steps. Working through these steps presupposes a reasonable level of knowledge in the broad subject area within which the study is to be undertaken and the research methodology itself. If you do not know what specific research topic, idea, questions or issue you want to research (which is not uncommon among students), first go through the following steps:

- Step 1: **Identify a broad field or subject area of *interest* to you.**
- Step 2: ***Dissect* the broad area into subareas.**
- Step 3: ***Select* what is of most interest to you.**
- Step 4: **Raise research questions.**
- Step 5: **Formulate objectives.**
- Step 6: **Assess your objectives.**
- Step 7: **Double-check.**

Statement Of Problem

After selecting a problem, it should be stated carefully the researchers to delimit his task and isolate a specific problem before he can proceed with active planning of the study. This type of decision is culminated in the problem statement. Kerlinger has identified three criteria of good Problem Statements.

1. A problem should be concerned with relation between two or more variables.
2. It should be stated "clearly and unambiguously in question form."
3. It should be amenable to empirical testing.

Meeting these criteria in his problem statement will result, on the researcher's part, in a clear and concise idea of what he wants to do, this sets the stage for further planning.

Evaluating the Problem

Once you find your potential research problem, you will need to evaluate the problem and ensure that it is appropriate for research. A research problem is deemed appropriate when it is supported by the literature, and considered significant, timely, novel, specific, and researchable. Stronger research problems are more likely to succeed in publication, presentation, and application.

Supported by the Literature

Your research problem should be relevant to the field and supported by a number of recent peer-reviewed studies in the field. Even if you identify the problem based on the recommendation of one journal article or dissertation, you will still need to conduct a literature search and ensure that other researchers support the problem and need for conducting research to further address the problem.

Significant: Your research problem should have a positive impact on the field. The impact can be practical, in the form of direct application of the results in the field, or conceptual, where the work advances the field by filling a knowledge gap.

Timely: Your research problem should be related to the current needs in the field and well-suited for the present status of the issues in your field. Explore what topics are being covered in current journals in the field. Look at calls from relevant disciplinary organizations. Review your research center agenda and focused topics. For example, the topics of the Research Labs at Center for Educational and Instructional Technology Research including critical thinking, social media and cultural competency, diversity, and Science, Technology, Engineering, and Mathematics (STEM) in higher education are representative of the current timely topics in the field of education. Identifying a current question in the field and supporting the problem with the recent literature can justify the problem timeliness.

Novel: Your research problem should be original and unique. It should seek to address a gap in our knowledge or application. An exhaustive review of literature can help you identify whether the problem has already been addressed with your particular sample and/or context. Talking to experts in the research area can illuminate a problem. Replication of an existing study warrants discussion of value elsewhere, but novelty can be found in determining if an already-resolved problem holds in a new sample and/or context.

Specific and Clear : Your research problem should be specific enough to set the direction of the study, raise research question(s), and determine an appropriate

research method and design. Vague research problems may not be useful to specify the direction of the study or develop research questions.

Researchable: Research problems are solved through the scientific method. This means research-ability, or feasibility of the problem, is more important than all of the above characteristics. You as the researcher should be able to solve the problem with your abilities and available research methods, designs, research sites, resources, and timeframe. If a research problem retains all of aforementioned characteristics but it is not researchable, it may not be an appropriate research problem Bryman (2007).

Lesson Five: Reviewing the Literature

One of the essential preliminary tasks when you undertake a research study is to go through the existing literature in order to acquaint yourself with the available body of knowledge in your area of interest. Reviewing the literature can be time consuming, daunting and frustrating, but it is also rewarding (Kumar,2011).

Meaning of Review of Literature

According to Singh (2006), the phrase 'review of literature' consists of two words: Review and Literature. The word 'literature' has conveyed different meaning from the traditional meaning.

In research methodology the term **literature** refers to the knowledge of a particular area of investigation of any discipline which includes theoretical, practical and its research studies. The term '**review**' means to organize the knowledge of the specific area of research to evolve an edifice of knowledge to show that his study would be an addition to this field. The task of **review of literature** is highly creative and tedious because researcher has to synthesize the available knowledge of the field in a unique way to provide the rationale for his study.

The term 'review of literature' has been defined in the following ways:

- **According to Good, Barr and Scates** "The competent physician must keep abreast of the latest discoveries in the field of medicine. Obviously the careful student of education, the research worker and investigator should become familiar with location and use of sources of educational information."
- **According to W.R. Borg** "The literature in any field forms the foundation upon which all future work will be built. If we fail to build the foundation of knowledge provided by the review of literature our work is likely to be shallow and naive and will often duplicate work that has already been done better by some one else."
- **According to Charter V. Good** "The keys to the vast storehouse of published literature may open doors to sources of significant problems and explanatory hypotheses and provide helpful orientation for definition of the problem, background for selection of procedure, and comparative data for interpretation of results. In order to be creative and original, one must read extensively and critically as a stimulus to thinking."
- **According to John 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."

Functions of the Literature Review

Kumar (2011) states the following functions of the literature review:

- It provides a theoretical background to your study.
- It helps you establish the links between what you are proposing to examine and what has already been studied.
- It enables you to show how your findings have contributed to the existing body of knowledge in your profession.
- It helps you to integrate your research findings into the existing body of knowledge.

In relation to your own study, the literature review can help in four ways. It can:

1. bring clarity and focus to your research problem;
2. improve your research methodology;
3. broaden your knowledge base in your research area; and
4. contextualise your findings.

How to review the literature

If you do not have a specific research problem, you should review the literature in your broad area of interest with the aim of gradually narrowing it down to what you want to find out about. After that the literature review should be focused around your research problem. There is a danger in reviewing the literature without having a reasonably specific idea of what you want to study. It can condition your thinking about your study and the methodology you might use, resulting in a less innovative choice of research problem and methodology than otherwise would have been the case. Hence, you should try broadly to conceptualise your research problem before undertaking your major literature review.

There are four steps involved in conducting a literature review:

1. Searching for the existing literature in your area of study.
2. Reviewing the selected literature.
3. Developing a theoretical framework.
4. Developing a conceptual framework.

Sources of Review of Literature

There are various sources of literature which may be used for this purpose. These sources can be broadly classified into these heads. (1) Books and Text-Books material. (2) The Periodical literature, and (3) General references.

1. Books and Text books Material

The most useful list of books published in the English language is the Cumulative Book Index and Book Review Index, Books Review Digest, Subject Guide to Books indicates that books are in print or press or forthcoming books. National Union Catalogue is also useful for this purpose. There are a number of publications that locate specific

references that cover particular area of knowledge. The Cumulative Book Index is published monthly to provide the references, all books published in the English Language. Sources of Information in the social sciences 'organized' by subject area and indexed by author and title, this work contains comprehensive list of reference books and monographs.

2. Periodicals

A periodical is defined as a publication issued in successive parts, usually at regular intervals, and as a rule, intended to be continued indefinitely. These include Yearbook, Documents, Almanacs, The Cumulative Book Index, International Abstracts, Journals, Newspapers, Magazines, International Index to Periodicals.

3. Abstracts

Another type of reference guide is the abstract, review, or digest. In addition to provide a systematized list of reference sources, it includes a summary of the contents. Usually the brief summaries of research studies are given in the form of abstract Educational abstracts, International abstracts in humanities.

4. Encyclopaedias

Encyclopaedias provide concise information on a number of subjects written by specialists. They provide a convenient source of information, and often include illustrations and bibliographies.

5. Almanacs, Handbooks, Yearbooks and Guides

This general category of references includes those publications that present rather detailed up-to-date information on a variety of subjects, organized around a given theme. They are the types of references that one consults to find specific information, often of a statistical nature. Generalized sources are listed first, followed by those with a more specialized emphasis.

- ✓ 'World Almanac' Book of Facts, New York: It is source of miscellaneous information of various subjects.
- ✓ 'Handbook of Research on Teaching' Chicago: It provides comprehensive research on teaching within depth and extensive bibliographies.

6. References on International Education

This type of publications deals with education outside the United States. 'The World Yearbook of Education', New York: It is issued annually and prepared under the joint responsibility of University of London and Teachers College of Columbia University, each issue is devoted to some aspect of international education. 'Inter-national Yearbook of Education', Geneva: The Yearbook presents in English and French a review of educational development for the previous year in the United States, Canada and more than 40 foreign countries.

7. Specialized Dictionaries

There are specialized dictionaries of education which includes terms, words and their meanings. 'Dictionary of Education,' New York: This educational dictionary covers technical and professional terms.

8. ERIC (Educational Research Information Centre)

The current knowledge explosion makes selective data retrieval the key to the research enterprise as well as to effective educational practice. The major developments in this regard as they relate to the educational literature are ERIC (Educational Research Information Centre) and SRIS (School Research Information Service). ERIC is an attempt to facilitate information exchange and to increase the value of research to the educational community by simply making its results readily available in usable form.

9. Dissertations and Theses

The theses and dissertations which embody the bulk of presenting educational research, are usually housed by the institutions and universities that award the authors their advanced degrees. Sometimes these studies are published in whole or in part in educational journals. The related dissertations and theses are the main sources of review of literature. The entry 'dissertations and theses' issue of the bibliographic index in the most comprehensive listing of sources to these research in progress.

11. Newspaper

The current newspapers provide up to-date information and speeches, reports, conferences. New developments in field of education. The current events and educational news are also reported in newspapers. It is also one of the important sources of review of literature. Exploring the literature moves the researcher to the frontiers of knowledge where he can evaluate new findings in his field, gaps in knowledge contradictory findings and identifying needed research. He will be familiar with methods and bibliographies that may prove useful in his own investigation.

REPORTING REVIEW OF LITERATURE

Generally review of literature is reported in the second chapter of the thesis or dissertation. The purpose of reporting the review of literature is not to write down research abstracts one by one which is usual practice of the researcher of to-day. It is most difficult and creative job on the part of researcher. The following procedure should be followed in reporting it :

- The research should go through collected research studies of the field. He should make an attempt to exhaust all sources of review of literature. He should try to evolve a criterion for classifying the studies. The usual or traditional classification is: studies conducted abroad and studies conducted in India in educational research. The educational researches can be classified: on the

educational level "(primary, secondary and college); and on the basis of variables of the study.

- After evolving criterion of classification, these studies, are arranged according to criterion. One type studies review should be reported separately. The similar type of findings should be given in next para, and he should try to relate with to his own study.
- At the end of review of literature. he should try to summarize in brief to provide a global picture of whole knowledge of the studies. After that he should relate his study to them and evolve gaps. In the end he should show that his study is a derivation from these studies.

VARIABLES IN RESEARCH

There are five types of variables. These are: (1) Independent Variables, (2) Dependent Variables, (3) Moderator Variables, (4) Control Variables, (5) Intervening Variables.

1. The Independent Variable: It is a stimulus variable. It is an input which operates either within a person or within environment to affect his/her behaviour. It is that factor which is measured, manipulated, or selected by the researcher to determine its relationship to an observed phenomenon.

2. The Dependent Variable: It is a response variable or output. It is an observed aspect of the behaviour of an organism that has been stimulated. The dependent variable is that factor which is observed and measured to determine the effect of the independent variable. It is the variable that will change as a result of variation in the independent variable. It is considered dependent because its value depends upon the value of the independent variable. It represents the consequence of change in the person or situation studied.

3. The Moderator Variable: It is defined as that factor which is measured, manipulated, or selected by the researcher to discover whether it modifies the relationship of independent variable to an observed phenomenon. The sex generally functions as a moderator variable.

4. The Control Variable: It is defined as that variable whose effect must be mentalised or cancelled by the researcher. In general, while the effects of the control

variables are neutralized, the effects of the moderator variables are studied.

Examples of control variables are: sex, intelligence, and socio-economic status.

5. The Intervening Variable: Each independent variable, moderator and control variables can be manipulated by the researcher and each variation can be observed by him/her as it affects the dependent variable. An intervening variable is that factor which affects the observed phenomenon, but cannot be seen and measured or manipulated. Examples of intervening variables are: the attitude, learning process, habit, and interest.

A RESEARCH HYPOTHESIS

After stating the research question and examining the literature, the quantitative researcher is ready to state a **hypothesis** based on the question. This should be done before beginning the research project. Recall that the quantitative problem asks about the relationship between two (or more) variables. The hypothesis presents the researcher's expectations about the relationship between variables within the question. Hence, it is put forth as a suggested answer to the question, with the understanding that the ensuing investigation may lead to either support for the hypothesis or lack of support for it.

There are two reasons for stating a hypothesis before the data-gathering phase of a quantitative study:

- ❖ A well-grounded hypothesis indicates that the researcher has sufficient knowledge in the area to undertake the investigation.
- ❖ The hypothesis gives direction to the collection and interpretation of the data; it tells the researcher what procedure to follow and what type of data to gather and thus may prevent a great deal of wasted time and effort on the part of the researcher.

1. Meaning of Hypothesis

The word hypothesis consists of two words: *Hypo+ thesis = hypothesis*

- ❖ 'Hypo' means tentative or subject to the verification or means composition of two/ it means more variables which is to be verified.

- ❖ 'Thesis' means statement about the solution of a problem / it means position of these variables in the specific frame of reference.

As such, a hypothesis is a tentative statement about the solution of the problem.

It offers a solution of the problem that is to be verified.

2. Definitions of Hypothesis

The term hypothesis has been defined in several ways. Some important definitions have been given in the following:

- **According to J. E. Greigton**

"A hypothesis is a tentative supposition or provisional guess which seems to explain the situation under observation".

- **According to B. W. Tuckman**

"A hypothesis is defined as an expectation about events based on generalisation of the assumed relationship between variables".

- **According to M. Verna**

"A hypothesis is a theory when stated as a testable proposition formally and clearly and subjected to empirical or experimental verification"

Some Examples of Hypotheses

- ✓ "Students who eat breakfast will perform better on a math exam than students who do not eat breakfast."
- ✓ "Students who experience test anxiety prior to an English exam will get higher scores than students who do not experience test anxiety."

3. Types of Hypothesis

A hypothesis may be classified in either of these two major types null or the alternative form.

The null hypothesis is denial of an existence, an attribute, a relationship, a difference or an effect. As such, it is stated in the negative form of the statement.

In contrast, **the alternative hypothesis** states the very opposite of what the null hypothesis predicts. Tentatively, it affirms the existence of a phenomenon.

4. Variables in Hypotheses

Hypotheses propose a relationship between two or more [variables](#). An **independent variable** is something the researcher changes or controls. A dependent variable is something the researcher observes and measures.

Daily apple consumption leads to fewer doctor's visits.

In this example, the independent variable is apple consumption — the assumed cause.

The dependent variable is the frequency of doctor's visits — the assumed effect.

5. Elements of a Good Hypothesis

When trying to come up with a good hypothesis for your own research or experiments, ask yourself the following questions:

- ❖ Is your hypothesis based on your research on a topic?
- ❖ Can your hypothesis be tested?
- ❖ Does your hypothesis include independent and dependent variables?

Before you come up with a specific hypothesis, spend some time doing **background research**. Once you have completed a literature review, start thinking

about potential questions you still have. Pay attention to the discussion section in the journal articles you read. Many authors will suggest questions that still need to be explored."

In order to form a hypothesis, you should take these steps:

- ❖ Collect as many observations about a topic or problem as you can.
- ❖ Evaluate these observations and look for possible causes of the problem.
- ❖ Create a list of possible explanations that you might want to explore.
- ❖ After you have developed some possible hypotheses, think of ways that you could confirm or disprove each hypothesis through experimentation. This is known as falsifiability.

6. Developing a Hypothesis

a. Ask a question

Writing a hypothesis begins with a research question that you want to answer. The question should be focused, specific, and researchable within the constraints of your project.

Do students who attend more lectures get better exam results?

b. Do some preliminary research

Your initial answer to the question should be based on what is already known about the topic. Look for theories and previous studies to help you form educated assumptions about what your research will find. At this stage, you might construct a conceptual

framework to identify which variables you will study and what you think the relationships are between them.

c. Formulate your hypothesis

Now you should have some idea of what you expect to find. Write your initial answer to the question in a clear, concise sentence.

Attending more lectures leads to better exam results.

d. Refine your hypothesis

You need to make sure your hypothesis is specific and testable. There are various ways of phrasing a hypothesis, but all the terms you use should have clear definitions, and the hypothesis should contain:

- The relevant variables.
- The specific group being studied.
- The predicted outcome of the experiment or analysis.

e. Phrase your hypothesis in three ways

A hypothesis often follows a basic format of "If {this happens} then {this will happen}." One way to structure your hypothesis is to describe what will happen to the dependent variable if you make changes to the independent variable. The basic format might be: "If {these changes are made to a certain independent variable}, then we will observe {a change in a specific dependent variable}."

If a first-year student starts attending more lectures, then their exam scores will improve.

In academic research, hypotheses are more commonly phrased in terms of correlations or effects, where you directly state the predicted relationship between variables.

The number of lectures attended by first-year students has a positive effect on their exam scores.

If you are comparing two groups, the hypothesis can state what difference you expect to find between them.

First-year students who attended most lectures will have better exam scores than those who attended few lectures.

f. Write a null hypothesis

If your research involves statistical hypothesis testing, you will also have to write a null hypothesis. The null hypothesis is the default position that there is no association between the variables. The null hypothesis is written as H_0 , while the alternative hypothesis is H_1 or H_a .

H_0 : The number of lectures attended by first-year students has no effect on their final exam scores.

H_1 : The number of lectures attended by first-year students has a positive effect on their final exam scores.

Examples of Hypthesis in Education: The following are additional examples of hypotheses in educational research:

- Boys in elementary school achieve at a higher level in single-sex classes than in mixed classes.
- Students who complete a unit on problem-solving strategies will score higher on a standardized mathematics test than those who have completed a control unit.
- Middle school students who have previously taken music lessons will have higher math aptitude scores.
- Students who do warm-up exercises before an examination will score higher on that examination than those who do not.
- Elementary school children who do not get adequate sleep will perform at a lower level academically than will their peers who have adequate sleep.

7. Characteristics of a Good a Hypothesis

- A hypothesis must be **testable**.
- A hypothesis should be **consistent with the existing body of knowledge**.
- A hypothesis should be stated as **simply and concisely** as possible.

Once a researcher has formed a testable hypothesis, the next step is to select a research design and start collecting data.

Sampling Methods in Research

Sampling involves the selection of a number of study units from a defined study population. The population is too large for us to consider collecting information from all its members. Instead, we select a sample of individuals hoping that the sample is representative of the population. **When taking a sample, we will be confronted with the following questions:**

- ✓ What is the group of people from which we want to draw a sample?
- ✓ How many people do we need in our sample?
- ✓ How will these people be selected?

1. Meaning and Definition of Sampling

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).

• **Coharn W. G. defines the term sampling as:**

'In every branch of science we lack the resources, to study more than a fragment of the phenomena that might advance our knowledge'. In this definition, a 'Fragment' is the sample as 'phenomena' is the population. The sample observations are applied to the phenomena i.e., generalisation.

• **David S. Fox defines the term sampling as:**

'In the social sciences, it is not possible to collect data from every respondent relevant to our study but only from some fractional part of the respondents. The process of selecting the fractional part is called sampling' (cited in Singh, 2006).

• **Cothari C. R. defines the term sampling as:**

'A sample refers to 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).

• **Kumar R. defines the term sampling as:**

'Sampling is the process of selecting a few (a sample) from a bigger group (the sampling population) to become the basis for estimating or predicting the prevalence of an unknown piece of information, situation, or outcome regarding the bigger group. A sample is a subgroup you are interested in' (2011).

2. Sampling Methods

(a) Probability Sampling: A probability sampling scheme is one in which every unit in the population has a chance (greater than zero) of being selected in the sample, and this probability can be accurately determined. Probability sampling includes:

- ❖ ***Simple random sampling:*** All subsets of the frame are given an equal probability of selection. In this case each individual is chosen entirely by chance and each member of the population has an equal chance, or probability, of being selected. One way of obtaining a random sample is to give each individual in a population a number, and then use a table of random numbers to decide which individuals to include. As with all probability sampling methods, simple random sampling allows the sampling error to be calculated and reduces selection bias. This sampling method is applicable when population is small, homogeneous, and really available.
- ❖ ***Systematic random sampling*** It relies on arranging the target population according to some ordering scheme and then selecting elements at regular intervals theory that ordered list. If you need a sample size n from a population of size x , you should select every x/n^{th} individual for the sample. For example, if you wanted a sample size of 100 from a population of 1000, select every

$1000/100 = 10^{\text{th}}$ member of the sampling frame. It is important in that the starting point is not automatically the first in the list, but is instead randomly chosen from within the first to the n^{th} element in the list.

- ❖ ***Stratified random sampling:*** In this method, the population is first divided into subgroups (or strata) who all share a similar characteristic. It is used when we might reasonably expect the measurement of interest to vary between the different subgroups, and we want to ensure representation from all the subgroups. A subgroup is a natural set of items. Subgroups might be based on company size, gender or occupation (to name but a few). Its purpose is to ensure that every stratum is adequately represented (Ackoff, 1953). For example, in a study of stroke outcomes, we may stratify the population by sex, to ensure equal representation of men and women.

- ❖ ***Cluster sampling:*** Cluster sampling is where the whole population is divided into clusters or groups. Subsequently, a random sample is taken from these clusters, all of which are used in the final sample (Wilson, 2010). Cluster sampling is advantageous for those researchers whose subjects are fragmented over large geographical areas as it saves time and money (Davis, 2005). It is an example of 'two-stage sampling'
 - First stage a sample of areas is chosen;
 - Second stage a sample of respondents within those areas is selected.

(b) Non-probability Sampling: Non probability sampling is often associated with case study research design and qualitative research. With regards to the latter, case studies tend to focus on small samples and are intended to examine a real life phenomenon, not to make statistical inferences in relation to the wider population (Yin, 2003). A sample of participants or cases does not need to be representative, or random, but a clear rationale is needed for the inclusion of some cases or individuals rather than others. It is also known as non-parametric sampling which is used for certain purposes. Non-probability sampling includes:

- ❖ **Convenience sampling:** Convenience sampling is selecting participants because they are often readily and easily available. Typically, convenience sampling tends to be a favored sampling technique among students as it is inexpensive and an easy option compared to other sampling techniques (Ackoff, 1953). Convenience sampling often helps to overcome many of the limitations associated with research. For example, using friends or family as part of sample is easier than targeting unknown individuals. The researcher using such a sample cannot scientifically make generalisations about the total population from this sample because it would not be representative enough.
- ❖ **Purposive sampling:** Purposive or judgmental sampling is a strategy in which particular settings, persons or events are selected deliberately in order to provide important information that cannot be obtained from other choices (Maxwell, 1996). It is where the researcher includes cases or participants in the sample because they believe that they warrant inclusion.
- ❖ **Quota sampling:** Quota sampling is a non random sampling technique in which participants are chosen on the basis of predetermined characteristics so that the total sample will have the same distribution of characteristics as the wider population (Davis, 2005). It is based on first the segmentation of the population into mutually exclusive sub-groups just as in stratified sampling. Then judgment is used to select sub- subjects or units from each segment based on a specified proportion. It is this second step that makes the technique one of the non-probability sampling.
- ❖ **Snowball sampling:** Snowball sampling is a non- random sampling method that uses a few cases to help encourage other cases to take part in the study, thereby increasing sample size. This approach is most applicable in small populations that are difficult to access due to their closed nature, e.g. secret societies and inaccessible professions (Breweton and Millward, 2001).

3. Size of a Sample

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.

DATA GATHERING TOOLS AND METHODS

1. Definition

Data are the observable and measurable facts that provide information about the phenomenon under study. A quality of research studies requires that highly reliable and valid data. Information collected from different research studies generally depends on various sources like primary and secondary sources.

2. Types of Sources

In research studies two types of data are collected primary and secondary.

- **Primary Sources:** Data directly collected from research units, which may be individuals, objects or programs. They provide the first hand information that is collected by the researcher directly from the respondents or the situations which may be collected through interviews, questioning, observation, etc....
- **Secondary Sources:** They are data collected from either internal or external secondary sources. External sources involved existing materials such as published or unpublished records which include journals, magazines, dissertations etc. Internal secondary sources are also known as private documents may include bio graphics, personal diaries, letters, etc...

3. Methods and Tools of Data Collection

3.1. Questionnaire: A questionnaire is structured instrument consisting of a series of questions prepared by researcher to gather data from individuals about knowledge, attitude and feeling. Questionnaires facilitate the collection of data by asking all, or a

sample of people, to respond to the same questions. They can be in both printed and electronic forms. The researcher can use different types of questions to design a questionnaire:

- **Open Ended Questions:** They are the questions which provide opportunity to the respondents to express their opinions and answers in their own way.
- **Closed Ended Questions:** These questions offer respondents a number of alternative replies, from which the subjects must choose the one that most likely matches the appropriate answer.
- **Dichotomous Questions:** This requires respondents to make a choice between two responses such as yes or no, true or false.
- **Multiple Choice Questions:** These questions require respondents to make a choice between more than two responses.
- **Rank Order Questions:** These questions ask respondents to rank their responses from most favorable to least favorable.
- **Contingency Questions:** A question is asked further only if the respondent gives a particular response to previous question. Ex: Q: Are you stressed? • No • Yes
If yes Why.....

3.2. Interview: An interview is a conversation between two or more people, where questions are asked by the interviewer to obtain information from the interview. It may be defined as the two way systematic conversation between an investigator and an informant initiated for obtaining information relevant to specific study. There are various types of interviews:

- **Structured Interview:** It is a mean of data collection in which the interview made with a detailed, standardized schedule. Same questions are put to all the respondents and in the same order. It is formalized and has limited set of questions, and it increases the reliability and credibility of research data.
- **Unstructured Interview:** It is a method where in questions can be changed to meet the respondent's intelligence, understanding and beliefs. Questions are changed based on how each individual person responds to the questions. It is not formalized, and it has open ended questions.
- **Semi Structured Interview:** It is a flexible method that allows new questions to be brought up during the interview depending upon the situation. Interviewer prepares an interview guide, which is an informal list of topics and questions that the interviewer can ask in different ways from different participants.
- **In depth Interview:** This is an intensive and investigative interview conducted and aimed at studying the respondent's opinion and emotions on the basis of interview guide.
- **Focused Group Interview:** It is an unstructured group interview technique where 8-12 members are brought together under the guidance of the trained interviewer, to focus on a specific phenomenon.

3.3. Observations: It is a way of gathering data by watching behavior, events or noting physical characteristics in their natural settings. Observations can be **overt** (everyone knows that they are being observed) or **covert** (everyone does not know that they are being observed). It is a technique for collecting all the

data or acquiring information on individual behavior or interaction between people.

The main types of observation are as follows:

- **Structured Observation:** In this researcher in advance prepares a structured or semi structured tool to observe the phenomenon under study. It is generally carried out by using tools like checklist, rating scale etc.
- **Unstructured Observation:** It is used for complete and nonspecific observation, which is very well known by the researcher. The tools are used by researcher are Log and field notes, Anecdotes, Field diary.
- **Participant Observation:** In this observer may live or work in field and actively participate in ongoing activities for the extended period.
- **Non Participant Observation:** In this observer works as an eaves dropper (secretly listening or observing), where an attempt is made to observe people without interacting with them.