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RESEARCH METHODS IN EDUCATION

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DIDACTICS OF FOREIGN LANGUAGES

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General Course Objectives

This course aims to guide Master One students at the Section of English in the specialty of Didactics of Foreign Languages at Tlemcen University towards achieving competence and proficiency in research methodology and particularly in education.

In more specific practical aims, the present course aims:

- To enable Master One students understand what research is.
- To support them in developing the most appropriate methodology for their research studies; and
- To raise awareness of crucial aspect of the nature of Knowledge and the value of scientific method
- To make them familiar with the art of using different research methods and techniques.
- To identify and justify the basic components of the research framework

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Unit 1: Research

Objectives

At the end of this unit, students should be able to:

- explain what research is;
- introduce the objectives and significance of research;
- set the motivation in research;
- know the general characteristics of research;
- recognize the criteria of a good research;
- distinguish between the different types of research;
- and differentiate between qualitative and quantitative research.

1. Definitions

Research purifies human life and improves its quality. It is a search for knowledge scientifically and systematically as well. In other words, it is a scientific and systematic search for pertinent information on a specific topic. Accordingly, it is the voyage of discovery and the quest for answers to unsolved problems.

- According to dictionaries:

a) The Advanced Learner's Dictionary of Current English:

öResearch is a careful investigation or inquiry especially through search for new facts in any branch of knowledge.ö

b) the Encyclopaedia of Social Sciences:

ö Research is the manipulation of things, concepts or symbols for the purpose of generalising to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art.ö

c) Merriam Webster:

öResearch is a studious inquiry or examination especially an investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws.ö

d) Oxford Dictionary:

öResearch is the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions.ö

e) Collins English Dictionary:

öResearch is work that involves studying something and trying to discover facts about it.ö

Synonyms: investigation, study, inquiry, analysis

- According to some scholars:

There are several definitions of research, proposed by famous authors and scholars of their time. In fact, the basic meaning and the context of these definitions are same. The difference lies only in the way the author has undertaken research in his discipline.

a) According to Shuttleworth (2008),

öThe definition of research includes any gathering of data, information and facts for the advancement of knowledge.ö

b) According to Creswell (2008),

öResearch is a process of steps used to collect and analyze information to increase our understanding of a topic or issue.ö

(It consists of three steps: Pose a question, collect data to answer the question, and present an answer to the question.)

c) According to Mouly

"Research is the systematic and scholarly application of the scientific method interpreted in its broadest sense, to the solution of social [í] problems; conversely, any systematic study designed to promote the development of social studies as a science can be considered researchö.

d) According to Leeds (1980)

öResearch 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 researcherö.

e) According to Cornell

öTo be sure the best research is that which is reliable, verifiable, and exhaustive, so that it provides information in which we have confidence. The main point here is that research is, literally speaking, a kind of human behaviour, an activity in which people engageö.

f) According to Woody (cited in Kothari, 1990)

öResearch is a carefully inquiry or examination in seeking facts or principles; a diligent investigation to ascertain something; and this definition makes clear the fact that research is not merely a search for truth, but a prolonged, intensive, purposeful search. It constitutes a method for the discovery of truth which is really a method of critical thinking; it comprises defining and redefining problems; formulating hypotheses or suggested solutions; collecting, organizing and evaluating data; making decisions and reaching conclusions to determine whether they fit the formulating hypothesesö.

g) According to Cook (cited in Singh, 2006)

"Research is an honest, exhaustive, intelligent searching for fact and their meanings or implications with reference to a given problem. The product of findings of a given piece of research should be an authentic, verifiable, and contribution to knowledge in the field studied.

Assignment 1: Discuss and explain each citation

Assignment 2: From those definitions, summarize your own definition of research.

One possible answer: Research is, thus, an original contribution to the existing stock of knowledge making for its advancement. It is the pursuit of truth with the help of study, observation, comparison and experiment. In short, the search for knowledge through objective and systematic method of finding solution to a problem is research. The systematic approach concerning generalization and the formulation of a theory is also research.

2. Objectives

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 (1990) sees that each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:

1. To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as *exploratory* or *formative* research studies);

2. 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);
3. 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);
4. To test a hypothesis of a causal relationship between variables (such studies are known as *hypothesis-testing* research studies).

Assignment 3: Give two main objectives of research with explanation

3. Significance

Research is important because it gives direction to deal with a specific problem. Whether the problem is thoroughly solved or not is not the forte of the research work. Accumulating amicable and all the possible solutions hypothetically are in themselves considered as a commendable achievement.

Hudson says that "All progress is born of inquiry. Doubt is often better than overconfidence, for it leads to inquiry, and inquiry leads to invention"

- 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. The increasingly complex nature of business and government has focused attention on the use of research in solving operational problems. 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. For instance, government's budgets rest in part on an

analysis of the needs and desires of the people and on the availability of revenues to meet these needs. The cost of needs has to be equated to probable revenues and this is a field where research is most needed.

- Through research we can devise alternative policies and can as well examine the consequences of each of these alternatives.
- Decision-making may not be a part of research, but research certainly facilitates the decisions of the policy maker.
- Another area in government, where research is necessary, is collecting information on the economic and social structure of the nation. Such information indicates what is happening in the economy and what changes are taking place. Collecting such statistical information is by no means a routine task, but it involves a variety of research problems. These days nearly all governments maintain large staff of research technicians or experts to carry on this work.
- Research has its special significance in solving various operational and planning problems of business and industry. Operations research and market research, along with motivational research, are considered crucial and their results assist, in more than one way, in taking business decisions.
- Market research is the investigation of the structure and development of a market for the purpose of formulating efficient policies for purchasing, production and sales. Operations research refers to the application of mathematical, logical and analytical techniques to the solution of business problems of cost minimisation or of profit maximisation or what can be termed as optimisation problems.
- Motivational research of determining why people behave as they do is mainly concerned with market characteristics. In other words, it is concerned with the determination of motivations underlying the consumer (market) behaviour.

- Research is equally important for social scientists in studying social relationships and in seeking answers to various social problems. It provides the intellectual satisfaction of knowing a few things just for the sake of knowledge and also has practical utility for the social scientist to know for the sake of being able to do something better or in a more efficient manner.
- Research in social sciences is concerned both with knowledge for its own sake and with knowledge for what it can contribute to practical concerns. This double emphasis is perhaps especially appropriate in the case of social science. On the one hand, its responsibility as a science is to develop a body of principles that make possible the understanding and prediction of the whole range of human interactions.
- On the other hand, because of its social orientation, it is increasingly being looked to for practical guidance in solving immediate problems of human relations
- In addition to what has been stated above, the significance of research can also be understood keeping in view the following points:
 - ✓ To those students who are to write a master's or Ph.D. thesis, research may mean a careerism or a way to attain a high position in the social structure;
 - ✓ To professionals in research methodology, research may mean a source of livelihood;
 - ✓ To philosophers and thinkers, research may mean the outlet for new ideas and insights;
 - ✓ To literary men and women, research may mean the development of new styles and creative work;

- ✓ To analysts and intellectuals, research may mean the generalisations of new theories.
- 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.

Assignment 4: Explain the nature, scope and significance of research in details.

4. Motivation in Research

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

É Desire to get a research degree with its consequential benefits;

É Desire to face challenge in solving unsolved problems;

É Desire to get intellectual joy of doing more creative work;

É Desire to be of service to society; and

É Desire to get respectability (Kothari, 1990).

However, this is not an exhaustive list of factors motivating people to undertake research studies. There are any more factors such as:

- directives of government,
- employment conditions,
- curiosity about new things,
- desire to understand causal relationships, social thinking and awakeningí etc. (ibid)

Assignment 5: What is your motivation for writing a research paper?

5. General Characteristics of Research

Cook has emphasised the following characteristics of research in his description:

It is an honest and exhaustive process.

The facts are studied with understanding.

The facts are discovered in the light of a problem. Research is problem-centred.

The findings are valid and verifiable.

Research work should contribute new knowledge in that field (Cited in Singh, 2006).

Leedy has insisted on that research has many discrete characteristics. These characteristics comprise the particular approach to a probing for truth. These latter include the following:

É Research begins with a question in the mind of the researcher.

É Research demands the identification of a problem, stated in clear, unambiguous terms.

É Research requires a plan.

É Research deals with the main problem through appropriate sub-problems.

É Research seeks direction through appropriate hypotheses and is based upon obvious assumption.

É Research deals with facts.

É Research is circular (Cited in Leeds, 1980).

The following characteristics may be gathered from the definitions of research:

It gathers new knowledge or data from primary or first-hand sources.

It places emphasis upon the discovery of general principles.

It is an extensive systematic and accurate investigation.

It uses certain valid data gathering devices.

It is logical and exact.

The researcher eliminates personal feelings and preferences.

Research is patient and unhurried activity

Research is carefully recorded and reported.

Conclusions and generalisations are arrived at carefully and cautiously (Singh, 2006).

Assignment 6: Some people consider research as a voyage of discovery of new knowledge. It comprises the creation of ideas and the generation of new knowledge that leads to new and improved insights and the development of new materials, devices, products, and processes. Explain describing the characteristics of a research.

6. Criteria of a Good Research

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

1. The purpose of the research should be clearly defined and common concepts be used.
2. The research procedure used should be described in sufficient detail to permit another researcher to repeat the research for further advancement, keeping the continuity of what has already been attained.
3. The procedural design of the research should be carefully planned to yield results that are as objective as possible.
4. The researcher should report with complete frankness, flaws in procedural design and estimate their effects upon the findings.
5. The analysis of data should be sufficiently adequate to reveal its significance and the methods of analysis used should be appropriate. The validity and reliability of the data should be checked carefully.
6. Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis.
7. Greater confidence in research is warranted if the researcher is experienced, has a good reputation in research and is a person of integrity.

In addition, a good research should be:

1. **systematic:** It means that research proceeds through a series of steps and stages to be taken in specified sequence in accordance with the well-defined set of rules. It follows a logical flow which must be understood by the researcher.
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. In fact, logical reasoning makes research more meaningful in the context of decision making.

3. **replicable:** This characteristic allows research results to be verified by replicating the study and thereby building a sound basis for decisions (Kothari, 1990).

Moreover, a good research should be:

1. **accurate:** Research emphasizes the importance of correspondence between what is said, what is observed and what has actually occurred.

2. **precise:** A research aims at estimating the exact amount of the event that has occurred or may yet to occur.

3. **recorded** Observations must be recorded. It is necessary to document observations with the aid of instruments like questionnaires, tape recorders for interviews.

4. **objective:** One's observations must not be influenced by personal preferences, prejudices, biases, attitudes and feelings. Subjective influences may take place especially when dealing with human behavior.

Assignment 6: Good research is systematic, discuss.

Possible answer: 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.

7. Types of Research

The basic types of research are:

1. Descriptive Vs. Analytical

The major aim of **descriptive** research is description of the state of affairs as it exists at present. It includes surveys and fact-finding enquiries of different kinds. The main characteristic of this method, also called Ex post facto research, is that the researcher has no control over the variables; he can only report what

has happened or what is happening. Most ex post facto research projects are used for descriptive studies in which the researcher seeks to measure such items as, for example, frequency of shopping, preferences of people, or similar data. Ex post facto studies also include attempts by researchers to discover causes even when they cannot control the variables. The methods of research utilized in descriptive research are survey methods of all kinds, including comparative and correlational methods. This type of research attempts to explain a situation, problem, phenomenon, service or programme.

In **analytical** research, on the other hand, researcher has to use facts or information already available, and analyse these to make a critical evaluation of the materials.

2. Applied Vs. Fundamental

Research can either be **applied** (action) research or **fundamental** (basic or pure) research. **Applied** research is done on the basis of pure or fundamental research to solve specific, practical questions; for policy formulation, administration and understanding of a phenomenon. It can be exploratory, but is usually descriptive. The purpose of doing such research is to find solutions to an immediate issue, solving a particular problem, developing new technology and look into future advancements etc. This involves forecasting and assumes that the variables shall not change. **Applied** research aims at finding a solution for an immediate problem facing a society or an organisation as stated by Travers, "It is undertaken to solve immediate practical problem and the goal of adding to scientific knowledge is secondary"; whereas, **fundamental** research is mainly concerned with generalisations and with the formulation of the theory as explained by Travers, that it is designed to add to an organised body of scientific knowledge and does not necessarily produce results of immediate practical value. As the term suggests a research activity taken up to look into some aspects of a problem or an issue for the first time is termed as basic or pure. It

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. The knowledge produced through pure research is sought in order to add to the existing body of research methods. Pure research is theoretical but has a universal nature. It is more focused on creating scientific knowledge and predictions for further studies.

Fundamental research is usually carried on in laboratory or other sterile environment; it is concerned with establishing general principles of learning. Its major aim is to obtain and use the empirical data to formulate, expand or evaluate theory, i.e. it is for the discovery of knowledge solely for the sake of knowledge.

Applied research is performed in relation to actual problems and under the conditions in which they are found in practice. Through applied research, educators are often able to solve their problems at the appropriate level of complexity, that is, in the classroom teaching learning situations.

Action research as part of applied research aims to solve classroom problems through the application of scientific methods. It is not concerned with whether the results are generalizable to any other setting and is not characterized by the same kind of control evidence in other categories of research. The primary goal of action research is a solution of a given problem, not contribution to science.

Thus, the central aim of **applied** research is to discover a solution for some pressing practical problem, whereas **basic** research is directed towards finding information that has a broad base of applications and thus, adds to the already existing organized body of scientific knowledge.

3. Conceptual Vs. Empirical

Conceptual research is that related to some abstract idea(s) or theory. It is generally used by philosophers and thinkers to develop new concepts or reinterpret new ideas. On the other hand, **empirical** research relies on experience or observation alone, often without due regard for system or theory.

Conceptual research focuses on the concept or theory that explains or describes the phenomenon being studied. What causes disease? How can we describe the motions of the planets? What are the building blocks of matter? The most famous example of a conceptual research is Sir Issac Newton. He observed his surroundings to conceptualize and develop theories about gravitation and motion. Einstein is widely known and appreciated for his work on **conceptual** research. Although his theories were based on conceptual observations, Einstein also proposed experiments to come up with theories to test the conceptual research.

Empirical research is data-based research, coming up with conclusions which are capable of being verified by observation or experiment. We can also call it as **experimental** type of research. In such a research, the researcher must first provide himself with a working hypothesis or guess as to the probable results. He then works to get enough facts (data) to prove or disprove his hypothesis. He then sets up experimental designs which he thinks will manipulate the persons or the materials concerned so as to bring forth the desired information.

Evidence gathered through experiments or **empirical** studies is today considered to be the most powerful support possible for a given hypothesis.

4. Some other Types of Research:

All other types of research are variations of one or more of the above stated approaches, based on either the purpose of research, or the time required to accomplish research, on the environment in which research is done, or on the basis of some other similar factor.

From the point of view of time, we can think of research either as **one-time** research or **longitudinal** research. In the former case the research is confined to a single time-period, whereas in the latter case the research is carried on over several time-periods.

Research can be **field-setting** research or **laboratory** research or **simulation** research, depending upon the environment in which it is to be carried out. Research can as well be understood as **clinical** or **diagnostic** research.

The research may be **exploratory** or it may be **formalized**. The objective of **exploratory** research is the development of hypotheses rather than their testing, whereas **formalized** research studies are those with substantial structure and with specific hypotheses to be tested.

Historical research is that which utilizes historical sources like documents, remains, etc. to study events or ideas of the past, including the philosophy of persons and groups at any remote point of time.

Research can also be classified as **conclusion-oriented** and **decision-oriented**. While doing **conclusion oriented** research, a researcher is free to pick up a problem, redesign the enquiry as he proceeds and is prepared to conceptualize as he wishes. **Decision-oriented** research is always for the need of a decision maker and the researcher in this case is not free to embark upon research according to his own inclination.

Assignment 7: Provide the key differences between Basic and Applied Research

Possible Answer:

a) Basic Research can be explained as research that tries to expand the already existing scientific knowledge base. On the contrary, applied research is used to mean the scientific study that is helpful in solving real-life problems.

b) While basic research is purely theoretical, applied research has a practical approach.

c) The applicability of basic research is greater than the applied research, in the sense that the former is universally applicable whereas the latter can be applied only to the specific problem, for which it was carried out.

d) The primary concern of the basic research is to develop scientific knowledge and predictions. On the other hand, applied research stresses on the development of technology and technique with the help of basic science.

e) The fundamental goal of the basic research is to add some knowledge to the already existing one. Conversely, applied research is directed towards finding a solution to the problem under consideration.

Assignment 8: What are the various types of research? Explain each in brief.

8. The Research Approach

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

a. The Qualitative Approach: It is empirical research where the data are not in the form of numbers (Punch, 1998: 4). It is expressed in words and used to understand concepts, thoughts or experiences. The aim of qualitative research is to understand the social reality of individuals, groups and cultures as nearly as possible as its participants feel it or live it.

b. The Quantitative Approach: It gathers data in a numerical form which can be put into categories, or in rank order, or measured in units of measurement. It is used to test or confirm theories and assumptions. This type of research can be used to establish generalizable facts about a topic. Its main aim is to establish general laws of behaviour and phenomenon across different settings/contexts.

QUALITATIVE	QUANTITATIVE
<ul style="list-style-type: none"> • Based on exploring ideas and formulating a theory • Analysed by summarizing, categorizing and interpreting. • Uses open- ended questions. • Used if you want to understand something (concepts, thoughts, experiences). • Main terms are: understanding, context, complexity, subjectivity. • For qualitative research, various techniques can be used to make sense of the data, such as 	<ul style="list-style-type: none"> • Based on testing theories and hypotheses. • Analysed through math and statistical analysis. • Uses (multiple choices) questions. • Used if you want to confirm or test something (a theory or hypothesis). • Main terms are: testing, measurement, objectivity. • Quantitative data is based on numbers. Simple math or more advanced statistical analysis is

<p>content analysis, grounded theory (Glaser & Strauss, 1967), thematic analysis (Braun & Clarke, 2006) or discourse analysis.</p> <ul style="list-style-type: none"> • Methods used are: Focus group, in -depth interview, sample observation, ethnographic research and record keeping. • Qualitative descriptions can play the important role of suggesting possible relationships, causes, effects and dynamic processes. • Qualitative analysis allows for ambiguities/contradictions in the data, which are a reflection of social reality (Denscombe, 2010). 	<p>used to discover patterns in the data. The results are often reported in graphs and tables.</p> <ul style="list-style-type: none"> • Methods used are: Close-ended surveys, rating scale questions, matrix survey questions, observation and experiments. • Quantitative data can be interpreted with statistical analysis, and since statistics are based on the principles of mathematics, the quantitative approach is viewed as scientifically objective, and rational (Carr, 1994; Denscombe, 2010). • Rapid analysis: Sophisticated software removes much of the need for prolonged data analysis, especially with large volumes of data involved (Antonius, 2003).
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<ul style="list-style-type: none"> • However, Subjective nature of qualitative data and its origin in single contexts, it is difficult to apply conventional standards of reliability and validity. • The time required for data collection, analysis and interpretation are lengthy. 	<ul style="list-style-type: none"> • However, Quantitative experiments do not take place in natural settings. In addition, they do not allow participants to explain their choices or the meaning of the questions may have for those participants (Carr, 1994) • Researcher expertise: Poor knowledge of the application of statistical analysis may negatively affect analysis and subsequent interpretation (Black, 1999).
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c. The Mixed-Methods Approach

Tashakkori and Teddlie (2003) discussed the mixed methods approach to research, which emerged in the mid-to-late 1900s. Johnson and Onwuegbuzie (2004) hoped that the mixed methods approach to research provided researchers with an alternative to believing that the quantitative and qualitative research approaches are incompatible and, in turn, their associated methods “cannot and should not be mixed” (p. 14). With the mixed methods approach to research, researchers incorporate methods of collecting or analyzing data from the quantitative and qualitative research approaches in a single research study (Creswell, 2003; Johnson & Onwuegbuzie; Tashakkori & Teddlie). That is, researchers collect or analyze not only numerical data, which is customary for quantitative research, but also narrative data, which is the norm for qualitative research in order to address the research question(s) defined for a particular

research study. As an example, in order to collect a mixture of data, researchers might distribute a survey that contains closed-ended questions to collect the numerical, or quantitative, data and conduct an interview using open-ended questions to collect the narrative, or qualitative, data.

By having the ability to design research studies that combine data collection or data analysis methods from the quantitative and qualitative research approaches, researchers are now able to test and build theories. Researchers are also able to employ deductive and inductive analysis in the same research study. The mixed methods approach to research provides researchers with the ability to design a single research study that answers questions about both the complex nature of phenomenon from the participants point of view and the relationship between measurable variables. Proponents of the mixed methods approach to research advocate doing “what works” within the precepts of research to investigate, to predict, to explore, to describe, to understand the phenomenon (Carr, 1994; Creswell, 2003; Johnson & Onwuegbuzie, 2004; Mingers, 2001; Sale, Lohfeld, & Brazil, 2002; Tashakkori & Teddlie, 2003).

Unit 2: Research Methodology

Objectives

At the end of this unit, students should be able to:

- Differentiate between research methodology and research design
- Know about research design, definition, purpose, need í etc.
- Understand research as a scientific method
- Recognize the research process in details

1. Research Methods versus Methodology

Research methods may be understood as all those methods/techniques that are used for the conduction of a 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. Since the object of research, particularly the applied research, it is to arrive at a solution for a given problem, the available data and the unknown aspects of the problem have to be related to each other to make a solution possible. A method plainly means a particular procedure for accomplishing or approaching something, especially a systematic or established one. Thus methodology can be understood as a set of specific procedures or techniques used to identify, select, process, and analyse information about a topic. It is the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge. The most important methodological choice researchers make is based on the distinction between qualitative and quantitative data i.e. whether it would collect descriptive data or a quantifiable data.

At times, a distinction is also made between research techniques and research methods. **Research techniques** refer to the behaviour and instruments we use in performing research operations such as making observations, recording data, techniques of processing data and the like while **research methods** refer to the behaviour and instruments used in selecting and constructing research technique. Keeping this in view, 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. While preparing **the design** of the study, it is necessary to think of **research method** for conducting a research. Generally, such methods are divided into quantitative and qualitative methods.

The term **methodology** seems to be broader, in the sense it includes nature of population, selection of sample, selection / preparation of tools, collection of data and how data will be analysed. Here the method of research is also included. **Research methodology** is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. It is necessary for the researcher to know not only the research methods/techniques but also the methodology.

Researchers not only need to know how to develop certain indices or tests, how to calculate the mean, the mode, the median or the standard deviation or chi-square, how to apply particular research techniques, but they also need to know which of these methods or techniques, are relevant and which are not, and what would they mean and indicate and why. Researchers also need to understand the assumptions underlying various techniques and they need to know the criteria by which they can decide that certain techniques and procedures will be applicable to certain problems and others will not. All this means that it is necessary for the researcher to design his **methodology** for his problem as the same may differ from problem to problem. From what has been stated above, we can say that research methodology has many dimensions and research methods do constitute a part of the research methodology.

The **scope of research methodology** is wider than that of research methods. Thus, when we talk of research methodology we not only talk of the research methods but also consider the logic behind the methods we use in the context of our research study and explain why we are using a particular method or technique and why we are not using others so that research results are capable of being evaluated either by the researcher himself or by others. Why a research study has been undertaken, how the research problem has been defined, in what way and why the hypothesis has been formulated, what data have been collected and what particular method has been adopted, why particular technique of analysing data has been used and a host of similar other questions are usually answered when we talk of research methodology concerning a research problem or study.

Assignment 9: What do you mean by research methodology?

2. Research and Scientific Method

For a clear perception of the term research, one should know the meaning of **scientific method**. The two terms, **research** and **scientific method**, are closely related. Research, as we have already stated, can be termed as 'an inquiry into the nature of, the reasons for, and the consequences of any particular set of circumstances, whether these circumstances are experimentally controlled or recorded just as they occur. Further, research implies the researcher is interested in more than particular results; he is interested in the repeatability of the results and in their extension to more complicated and general situations.' On the other hand, the philosophy common to all research methods and techniques, although they may vary considerably from one science to another, is usually given the name of scientific method. In this context, Karl Pearson writes, 'The scientific method is one and same in the branches (of science) and that method is the method of all logically trained minds – the unity of all sciences consists alone in its methods, not its material; the man who classifies facts of any kind whatever, who sees their mutual relation and describes their sequences, is applying the Scientific Method and is a man of science.' **Scientific method** is the pursuit of truth as determined by logical considerations. The ideal of science is to achieve a systematic interrelation of facts. **Scientific method** attempts to achieve 'this ideal by experimentation, observation, logical arguments from accepted postulates and a combination of these three in varying proportions.' In **scientific method**, logic aids in formulating propositions explicitly and accurately so that their possible alternatives become clear. Further, logic develops the consequences of such alternatives, and when these are compared with observable phenomena, it becomes possible for the researcher or the scientist to state which alternative is most in harmony with the observed facts. All this is done through

experimentation and survey investigations which constitute the integral parts of **scientific method**.

The **scientific method** is, thus, based on certain basic postulates which can be stated as under:

1. It relies on empirical evidence;
2. It utilizes relevant concepts;
3. It is committed to only objective considerations;
4. It presupposes ethical neutrality, i.e., it aims at nothing but making only adequate and correct statements about population objects;
5. It results into probabilistic predictions;
6. Its methodology is made known to all concerned for critical scrutiny is for use in testing the conclusions through replication;
7. It aims at formulating most general axioms or what can be termed as scientific theories.

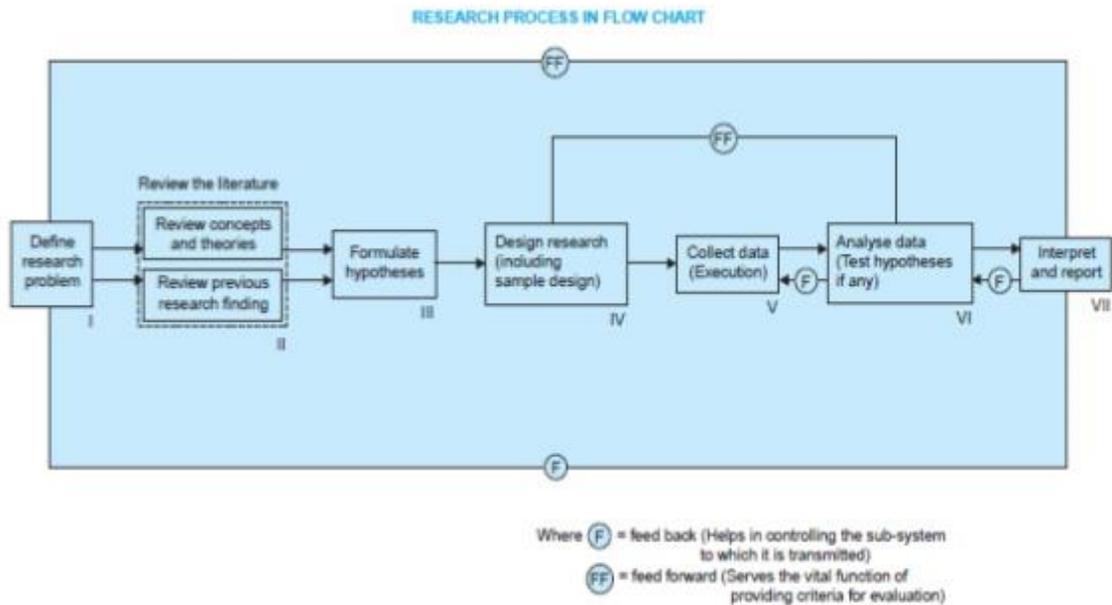
Thus, the **scientific method** encourages a rigorous, impersonal mode of procedure dictated by the demands of logic and objective procedure. Accordingly, **scientific method** implies an objective, logical and systematic method, i.e., a method free from personal bias or prejudice, a method to ascertain demonstrable qualities of a phenomenon capable of being verified, a method wherein the researcher is guided by the rules of logical reasoning, a method wherein the investigation proceeds in an orderly manner and a method that implies internal consistency.

3. Research Process

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.

Research Process Flow Chart



The chart indicates that the research process consists of a number of closely related activities, as shown through I to VII. But such activities overlap continuously rather than following a strictly prescribed sequence. They do not necessarily follow each other in any specific order. However, the following order concerning various steps provides a useful procedural guideline regarding the research process: (1) formulating the research problem; (2) extensive literature survey; (3) developing the hypothesis; (4) preparing the research design; (5) determining sample design; (6) collecting the data; (7) execution of the project; (8) analysis of data; (9) hypothesis testing; (10) generalizations and interpretation, and (11) preparation of the report or presentation of the results, i.e., formal write-up of conclusions reached.

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,

É makes the research work practical

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

É The words used should have a single meaning,

É The statement of the problem must be brief but comprehensive.

É The assumptions are to be recognised for the study.

É The problem should have practical importance in the field.

É The definition or statement of the problem should have certain rationale.

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

É The researcher should develop a conceptual framework of the problem.

É Delimiting the elements of the problem.

É Classifying the elements in the homogeneous group.

É Locating the key-concepts in the conceptual framework.

É Evaluating the theoretical security of the problem.

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

É Deciding 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:

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

It should be stated clearly and unambiguously in right form

It 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:

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

It 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.

It 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 retrieve 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 designed 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:

ÉWhat is the study about?

ÉWhere will study be carried out?

ÉWhat type of data is necessary?

ÉWhere necessary data is available?

ÉHow much time is needed to complete the study?

ÉWhat will be the sampling design?

ÉWhich tools will be identified to collect data?

ÉHow data will be analysed?

From the purposes of a research design is that:

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

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

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

ÉIt 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

ÉConvenience sample

ÉPurposive sample

ÉQuota 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:

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

ÉComposition: focus groups work better with homogeneous samples.

ÉParallel 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:

ÉOrientation to a particular field of forms;

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

ÉGenerating hypotheses that derive from the insights and from the group;

ÉGenerating 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 data" from the "situations". 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.

Assignment 10:

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. Discuss

Unit 3: Education

Objectives

At the end of this unit, students should be able to:

- Know what is education in general
- Recognize the nature, scope and objectives of education

1. Meanings

Education, like philosophy is also closely related to human life. Therefore, being an important life activity education is also greatly influenced by philosophy. Various fields of philosophy like the political philosophy, social philosophy and economic philosophy have great influence on the various aspects of education like educational procedures, processes, policies, planning and its implementation, from both the theoretical and practical aspects.

Etymologically, the word education is derived from educare (Latin) "bring up", which is related to educere "bring out", "bring forth what is within", "bring out potential" and educere, "to lead".

Education is a process to bring about change in human behavior. Every individual should have access to a type of education that permits maximum development of his potential and capabilities. **Education** in the largest sense is any act or experience that has a formative effect on the mind, character or physical ability of an individual. In its technical sense, education is the process by which society deliberately transmits its accumulated knowledge, skills and values from one generation to another.

Webster defines **education** As the process of educating or teaching (now that's really useful, isn't it?) Educate is further defined as "to develop the knowledge, skill, or character of..." Thus, from these definitions, we might assume that the purpose of education is to develop the knowledge, skill, or character of students.

Definitions of education

Concepts of Education as defined by Western philosophers are as follow:

1. Socrates: "Education means the bringing out of the ideas of universal validity which are latent in the mind of every man".

2. Plato: "Education is the capacity to feel pleasure and pain at the right moment. It develops in the body and in the soul of the pupil all the beauty and all the perfection which he is capable of."

3. Aristotle: "Education is the creation of a sound mind in a sound body. It develops man's faculty, especially his mind so that he may be able to enjoy the contemplation of supreme truth, goodness and beauty of which perfect happiness essentially consists.

4. Rousseau: "Education of man commences at his birth; before he can speak, before he can understand he is already instructed. Experience is the forerunner of the perfect".

5. Herbert Spencer: "Education is complete living".

6. Heinrich Pestalozzi: "Education is natural harmonious and progressive development of man's innate powers".

7. Friedrich Willian Froebel: "Education is unfoldment of what is already enfolded in the germ. It is the process through which the child makes internal external".

2. Nature

The natures of education are:

(a) Education is life-long process- Education is life long process because every stage of life of an individual is important from educational point.

(b) Education is a systematic process- It refers to transact its activities through a systematic institution and regulation.

(c) Education is development of individual and the society- It is called a force for social development, which brings improvement in every aspect in the society.

(d) Education is modification of behavior- Human behavior is modified and improved through educational process.

(e) Education is a training- Human senses, mind, behavior, activities; skills are trained in a constructive and socially desirable way.

(f) Education is instruction and direction- It directs and instructs an individual to fulfill his desires and needs for exaltation of his whole personality.

(g) Education is life- Life without education is meaningless and like the life of a beast. Every aspect and incident needs education for its sound development.

(h) Education is continuous reconstruction of our experiences- As per the definition of John Dewey education reconstructs and remodels our experiences towards socially desirable way.

(i) Education is a power and treasure in human being through which he is entitled as the supreme master on the earth.

Therefore, the role of education is countless for a perfect society and man. It is necessary for every society and nation to bring holistic happiness and prosperity to its individuals.

3. Scope

Scope means range of view field or opportunity of activity operation and application. Education has a wider meaning and application.

1. Educational philosophy

Philosophy of education covers aims of education, nature of education, importance of education, and functions of education its very old and essential part of education.

2. Educational psychology

Main aim of education is the development of child. Psychology helps to understand the child better and development of child with respect of physical, mental, emotional, social adjustment, individual difference, personality, thinking, reasoning, problem solving.

3. Educational sociology

A child lives in the society so it is important for him to know about the society the nature of society, type of society, interdependence between culture and society.

4. History of education

It is also important to know background, origin, development, growth and aspect of the subjects. i.e., education system method of teaching during ancient period, medieval period, British period and modern period.

5. Economics of education

For the growth of business and market the world class economical education is important for each and important.

6. Method of teaching

In ancient time the pupils were passive listeners but now they actively participate with the teacher in the process of education. So the skill and proficiency of different teaching methods needs to be developed.

7. Educational administration and supervision

The educational institution and the system have to be supervised and administrated smoothly so that the process of education goes well as the

regulation of fund, democratic administration, autonomy, personnel management etc.

8. Problems of education

This scope includes problems of teaching management of education and also suggestion and remedies for it.

9. Population education

Viewing at the undesirable growth of population, awareness is created through population education.

10. Environmental education

Ecological in balances have drown the attentions of intelligence today.

So looking at the environmental problems study of environment education has great importance.

4. Objectives

Every task is done for a particular purpose; it becomes easy to achieve it when we know its objectives and goals as well.

Types of Objectives

Objectives can be classified into three domains of learning:

1. Cognitive Objectives deal with what a student should know, understand or comprehend. They emphasize remembering or reproducing something which has presumably been learned. Solving some intellectual tasks for which the individual has to determine the essential problem. They reorder given material or combine it with ideas, methods, or procedures previously learned. They also vary from simple recall of material learned to highly original and creative ways of combining and synthesizing new ideas and materials. Then, they should encourage higher order thinking using Bloom's Taxonomy as a guide

2. Psychomotor Objectives are concerned with how a student controls or moves his body. They emphasize some muscular or motor skill such as use of precision instruments or tools, and encourage actions which evidence gross motor skills such as the use of the body in dance or athletic performance.

3. Affective Objectives deal with how a student should feel about something, emphasize a feeling tone, an emotion, a degree of acceptance or rejection, attitudes, appreciations, or relationships. They vary from simple attention to selected phenomena to complex but internally consistent qualities of character and conscience.

In summary,

Cognitive objectives emphasize THINKING,

Affective objectives emphasize FEELING and

Psychomotor objectives emphasize ACTING.

NOTE: Objectives can overlap into more than one learning domain. Look at the primary emphasis of the objective. Ask yourself what type of student behavior is most emphasized in the objective. Is it one of thinking, feeling or acting?

Unit 4: Educational Research

Objectives

At the end of this unit, the students should:

- Understand the concept of educational Research
- Understand the scope of educational Research
- Comprehend the purpose of Educational Research

1. Meaning

Educational research refers to the systematic collection and analysis of data related to the field of education. Research may involve a variety of methods and various aspects of education including student learning, teaching methods, teacher training, and classroom dynamics. It is the process of scientific inquiry to solve the problems of educational sector and it includes theoretical elaboration, quality enhancement matters, policy draft and implication, classroom dimension and so forth. It involves a continuous enquiry in search of knowledge, advancement, problem solving methodology and an attempt to realize the truth from an objective point of view based on factual understanding and systematic study.

According to Mouly, **“Educational Research** is the systematic application of scientific method for solving educational problem.”

Travers thinks, **“Educational Research** is the activity for developing science of behaviour in educational situations. It allows the educator to achieve his goals effectively.”

According to Whitney, **“Educational Research** aims at finding out solution of educational problems by using scientific philosophical method.”

Educational Research Characterizes as follows:

- It is highly purposeful.

- It deals with educational problems regarding students and teachers as well.
- It is precise, objective, scientific and systematic process of investigation.
- It attempts to organize data quantitatively and qualitatively to arrive at statistical inferences.
- It discovers new facts in new perspective. i. e. It generates new knowledge.
- It is based on some philosophic theory.
- It depends on the researchers ability, ingenuity and experience for its interpretation and conclusions.
- It needs interdisciplinary approach for solving educational problem.
- It demands subjective interpretation and deductive reasoning in some cases.
- It uses classrooms, schools, colleges department of education as the laboratory for conducting researches.

2. Steps

Step 1 : Identifying the Gap in Knowledge

The researcher, on the basis of experience and observation realises that some students in the class do not perform well in the examination. So he / she poses an unanswered question : Which factors are associated with students' academic performance?

Step 2 : Identifying the Antecedent / Causes On the basis of experience, observation and a review of related literature, he / she realises that students who are either very anxious or not at all anxious do not perform well in the examination. Thus he / she identifies anxiety as one of the factors that could be associated with students' academic performance.

Step 3 : Stating the Goals The researcher now states the goals of the study :

1. To ascertain the relationship of anxiety with academic performance of students.
2. To ascertain the gender differences in the anxiety and academic performance of students.
3. To ascertain the gender difference in the relationship of anxiety with academic performance of students.

Step 4 : Formulating Hypotheses The researcher may state his / her hypotheses as follows:

1. There is a significant relationship between anxiety and academic performance of students.
2. There is a significant gender difference in the anxiety and academic performance of students.
3. There is a significant gender difference in the relationship of anxiety with academic performance of students.

Step 5 : Collecting Relevant Information The researcher uses appropriate tools and techniques to measure anxiety and academic performance of students, selects a sample of students and collects data from them.

Step 6 : Testing the Hypotheses

He / she now uses appropriate statistical techniques to verify and test the hypotheses of the study stated in Step 4.

Step 7 : Interpreting the Findings

He / she interprets the findings in terms of whether the relationship between anxiety and academic performance is positive or negative, linear or curvilinear.

He / she finds that this relationship is curvilinear i.e. when a student's anxiety is either very low or very high, his / her academic performance is found to be low.

But when a student's anxiety is moderate, his / her academic performance is found to be high.

He / she now tries to explain this finding based on logic and creativity.

Step 8 : Comparing the Findings with Prior researchers' Findings

- The researcher tries to find out whether his / her conclusions match those of the prior researches or not. If not, then the researcher attempts to find out why conclusions do not match with other researches by analysing prior studies further.

Step 9 : Modifying Theory

On the basis of steps 7 and 8, the researcher speculates that anxiety alone cannot influence academic performance of students. There could be a third factor which influences the relationship between anxiety and academic performance of students.

This third factor could be study habits of students. For instance, students who have very low level of anxiety may have neglected their studies through out the year and hence their academic performance is poor. On the other hand, students who have very high level of anxiety may not be able to remember what they have learnt or cannot concentrate on studies due to stress or may fall sick very often and hence cannot study properly. Hence their academic performance is poor.

However, students with a moderate level of anxiety are motivated enough to study regularly and systematically all through the year and hence their academic performance is high.

Thus, the loosely structured theory on students÷academic performance needs to incorporate one more variable, namely, study habits of students. In other words, it needs to be modified.

Step 10 : Asking New Questions

- Do study habits and anxiety interact with each other and influence academic performance of students? i.e. we can now start with a fresh topic of research involving three variables rather than two.

3. Scope

Name of Educational Research changes with the gradual development occurs with respect to knowledge and technology, so Educational Research needs to extend its horizon. Being scientific study of educational process, it involves :

- individuals (Student, teachers, educational managers, parents.)
- institutions (Schools, colleges, research ó institutes)

It discovers facts and relationship in order to make educational process more effective. It relates social sciences like education. It includes process like investigation, planning (design) collecting data, processing of data, their analysis, interpretation and drawing inferences. It covers areas from formal education and conformal education as well.

Unit 5: Research Methods in Education

Objectives

By the end of this unit, students should:

- Understand research methods in education
- Know sources of acquiring knowledge
- Distinguish the relationship between science, education and educational research
- Comprehend the aims and characteristics of research as a scientific activity
- Grasp some ethical considerations related to research
- Understand the reliability, validity and generalizability in research

1. What are Research Methods?

Research shows how to solve any problem scientifically and it is a careful enquiry through search for any kind of Knowledge. It is a journey from known to unknown. It is a systematic effort to gain new knowledge in any kind of discipline. When it seeks a solution of any educational problem it leads to educational research.

Research Methods are ways of getting data ó such as talking to people or reading information on web sites. You are likely to use a variety of Research Methods in your study ó this collection of methods will typically be the middle part of a research Methodology ó earlier parts may be a literature review and later parts data analysis techniques.

2. Sources of Acquiring Knowledge

From the time we were born and the present day, each one of us has accumulated a body of knowledge. Curiosity, the desire to learn about one's

environment and the desire to improve one's life through problem-solving is natural to all human beings. For this purpose, human beings depend on several methods / sources of acquiring knowledge as follows:

1. Learned Authority : Human beings refer to an authority such as a teacher, a parent or the boss or an expert or consultant and seek his / her advice. Such an authority may be based on knowledge or experience or both. For example, if a child has difficulty in learning a particular subject, he / she may consult a teacher. Learned authority could also be a book / dictionary / encyclopedia / journal / web-site on internet.
2. Tradition : Human beings easily accept many of the traditions of their culture or forefathers. For example, in matters of food, dress, communications, religion, home remedies for minor ailments, the way a friend will react to an invitation, one relies on family traditions. On the other hand, students, in case of admission criteria and procedures, examination patterns and procedures, methods of maintaining discipline, co-curricular activities, acceptable manner of greeting teachers and peers rely on school traditions. Long established customs or practices are popular sources of acquiring knowledge. This is also known as tenacity which implies holding on to a perspective without any consideration of alternatives.
3. Experience : Our own prior personal experiences in matters of problem-solving or understanding educational phenomena is the most common, familiar and fundamental source of knowledge.
4. Scientific Method : In order to comprehend and accept learning acquired through these sources, we use certain approaches which are as follows:

- (a) Empiricism : It implies relying on what our senses tell us. Through a combination of hearing and seeing we come to know the sound of a train. i.e. through these two senses, we learn to associate specific sounds with specific objects. Our senses also enable us to compare objects / phenomena / events. They provide us with the means for studying and understanding relationships between various concepts (eg. level of education and income).
- (b) Rationalism : It includes mental reflection. it places emphasis on ideas rather than material substances. if we see logical interconnectedness between two or more things, we accept those things. For example, we may reason that conducive school / college environment is expected to lead to better teacher performance.
- (c) Fideism : It implies the use of our beliefs, emotions or gut reactions including religion. We believe in God because our parents told us though we had not sensed God, seen or heard him nor had concluded that that his existence is logically proved.

3. Relationship between Science, Education and Educational Research

Science helps to find out the truth behind the phenomenon. It is an approach to gathering of knowledge rather than mere subject matter. It has following two main functions:

- to develop a theory.
- to deduce hypothesis from that theory.

Scientist uses an empirical approach for data collection and rational approach for development of the theory.

Research shows a way to solve life's problems scientifically. It is a reliable tool for progress of knowledge. Being systematic and methodological, it is treated as a science. It also helps to derive the truth behind the knowledge. It offers methods of improving quality of the process and the product as well. Ultimately, Science and research go hand in hand to find out solution of the problem.

Since Philosophy offers a sound basis to education, Education is considered as an art. However, scientific progress makes education inclining towards a science rather than an art.

Science belongs to precision and exactness. It suffers hardly from any variable. But education as a social science suffers from many variables, so goes away from exactness. Educational Research tries to make educative process more scientific. But education is softening from multivariable, so it can't be as exact as physical sciences. If the study is systematically designed to achieve educational goals, it will be an educational research. Let us summarize this discussion with Good's thought: "If we wish wisdom, we must expect science. If we wish an increase in wisdom, we must expect research."

Knowledge is educator's need. Curiosity and thirst for search makes him to follow scientific way wisely. Indirectly, he plays a role of educational researcher. Ultimately he is able to solve the educational problem and generate new knowledge. All the three aspects (Science, education and educational research) have truth as a common basis, more or less; they need exactness and precision while solving a problem.

4. Aims and Characteristics of Research as a Scientific Activity

An enquiry is a natural technique for a search. But when it's used systematically and scientifically, it takes the form of a method. So, scientific enquiry is also known as Scientific Method.

Bacon's inductive method contributes to human knowledge. It is difficult to solve many problems either by inductive or by deductive method. So Charles Darwin seeks happy blending of inductive and deductive method in his scientific method. In this method, initially knowledge gained from previous knowledge, experience, reflective thinking and observation is unorganized. Later on it proceeds inductively from part to whole and particular to general and ultimately to meaningful hypothesis. Thereafter, it proceeds deductively from whole to part, general to particular and hypothesis to logical conclusion.

This method is different from the methods of knowledge generation like trial and error, experience, authority and intuition. It is a parallel to Dewey's reflective thinking; because the researcher himself is engrossed in reflective thinking while conducting research. Scientific method follows five steps as under:

Identification and definition of the problem: The researcher states the identified problem in such a manner that it can be solved through experimentation or observation.

Formulation of hypothesis: It allows to have an intelligent guess for the solution of the problem.

Implication of hypothesis through deductive reasoning : Here, the researcher deduces the implications of suggested hypothesis, which may be true.

Collection and analysis of evidence: The researcher is expected here to test the deduced implications of the hypothesis by collecting concerned evidence related to them through experimentation and observation.

Verification of the hypothesis: Later on the researcher verifies whether the evidence support hypothesis. If it supports, the hypothesis is accepted, if it

doesn't the hypothesis is not accepted and later on it is modified if it is necessary. A peculiar feature of this method is not to prove the hypothesis as an absolute truth but to conclude that the evidence does or doesn't support the hypothesis.

5. Ethical Considerations of Research

Research exerts a significant influence over educational systems. Hence a researcher needs to adhere to an ethical code of conduct. These ethical considerations are as follows:

- While a researcher may have some obligations to his / her client in case of sponsored research where the sponsoring agency has given him / her financial aid for conducting the research, he / she has obligations to the users, the larger society, the subjects (sample / respondents) and professional colleagues. He / she should not discard data that can lead to unfavourable conclusions and interpretations for the sponsoring agency.
- The researcher should maintain strict confidentiality about the information obtained from the respondents. No information about the personal details of the respondents should be revealed in any of the records, reports or to other individuals without the respondents' permission.
- The researcher should not make use of hidden cameras, microphones, tape-recorders or observers without the respondents' permission. Similarly, private correspondence should not be used without the concerned respondent's permission.

- In an experimental study, when volunteers are used as subjects, the researcher should explain the procedures completely (eg. the experiment will go on for six months) along with the risks involved and the demands that he / she would make upon the participants of the study (such as the subjects will be required to stay back for one hour after school hours etc.). If possible, the subjects should be informed about the purpose of the experiment / research. While dealing with school children (minors) or mentally challenged students, parents or guardians consent should be obtained. This phenomenon is known as informed consent.
- The researcher should accept the fact that the subjects have the freedom to decline to participate or to withdraw from the experiment.
- In order to ensure the subjects' inclusion and continuation in the experiment, the researcher should never try to make undue efforts giving favourable treatment after the experiment, more (additional marks) in a school subject, money and so on.
- In an experimental research which may have a temporary or permanent effect on the subjects, the researcher must take all precautions to protect the subjects from mental and physical harm, danger and stress.
- The researcher should make his / her data available to peers for scrutiny.
- The respondents / subjects / participants should be provided with the reasons for the experimental procedures as well as the findings of the study if they so demand.

- The researcher should give due credit to all those who have helped him / her in the research procedure, tool construction, data collection, data analysis or preparation of the research report.
- If at all the researcher has made some promise to the participants, it must be honoured and fulfilled.

6. Reliability, Validity and Generalizability

Before we look in detail at Research Methods, there are three issues that we need to be mindful of 6 issues that should be uppermost in a researcher's mind as they design and conduct their research.

Reliability refers to the quality of the methods used. It is a synonym of dependability, consistency and replicability over time and over groups of respondents. It is concerned with accuracy and precision. For research to be reliable it must demonstrate that if it were to be carried out on a similar group of respondents in a similar context then similar results would be found. Reliability is a precondition or sine qua non of validity.

Validity is about the quality of data. It is important here to remember that high quality data depends on the accuracy or reliability of the methods used. It is very easy to slip into invalidity as it can enter at every stage of the research from design to data gathering rendering the research invalid or heavily biased. The researcher can take steps to ensure that as far as possible invalidity has been minimized in all areas of the research. For instance at the design stage, through choosing an appropriate timescale and appropriate methodology, and at the stage of data gathering by trying to avoid drop out amongst respondents and minimizing reactivity effects (respondents behaving differently when subjected to scrutiny or being placed in new situations). At the data analysis and data

reporting stage one of the main ways of enhancing validity is by avoiding selective use of data.

As the name suggests the **generalizability** of our research refers to how generalized the claims we can make about what our research explores or uncovers. If, for example, our research highlights the importance of reward as a motivator in ensuring good classroom discipline, then to what extent can that claim be applied in general to all classrooms? For the researcher it often means enhancing the potential for generalization by maximizing the range of a sample's characteristics in exploring a particular issue or phenomenon, i.e. to ensure that as many different cases as possible are included in our research.

Test

Choose the most appropriate answer. One answer is allowed only.

1. The main purpose of research in education is to _____
 - A. Increase social status of an individual
 - B. Increase job prospects of an individual
 - C. Help in the personal growth of an individual
 - D. Help the candidate become an eminent educationist

2. Sampling is advantageous as it _____
 - A. Saves time
 - B. Helps in capital-saving
 - C. Both (a) and (b)
 - D. Increases accuracy

- 3 . Random sampling is helpful as it is _____.
 - A. Reasonably accurate
 - B. Free from personal biases
 - C. An economical method of data collection
 - D. All the above

4. Research and Development become the index of development of country. Which of the following reasons are true with regards to this statement?
 - A. Because R&D targets the human development
 - B. Because R&D can improve the standard of living of the people in a country
 - C. Because R&D reflect the true economic and social conditions prevailing in a country
 - D. All the above

- 5 . The data of research is _____
 - A. Qualitative only
 - B. Quantitative only
 - C. Both (a) and (b)
 - D. Neither (a) nor (b)

- 6 . Which of the following is NOT the characteristic of a research?
 - A. Research is systematic
 - B. Research is not passive
 - C. Research is not a process
 - D. Research is problem oriented

7. Which of the following statement is correct?

- A. Discoveries are researches
- B. Researches lead to discovery
- C. Invention and Research are related
- D. None of the above

8. Which of the following statement is correct?

- A. objectives should be pin-pointed
- B. another word for problem is variable
- C. objectives can be written in statement or question form
- D. all the above

9. Which of the following options are the main tasks of research in modern society?

- A. to discover new things
- B. to keep pace with the advancement in knowledge
- C. to systematically examine and critically analyse the investigations/sources with objectivity
- D. all of the above

10. One of the aims of the scientific method in research is to:

- A. confirm triangulation
- B. introduce new variables
- C. improve data interpretation
- D. eliminate spurious relations

11. Which of the following is not the Method of Research?

- A. Survey
- B. Historical
- C. Observation
- D. Philosophical

12. Research ethics do not include

- A. Integrity
- B. Honesty
- C. Objectivity
- D. Subjectivity

Key Answer

1 . The main purpose of research in education is to _____

Answer: D

2. Sampling is advantageous as it _____

Answer: C

3 . Random sampling is helpful as it is _____.

Answer: D

4. Research and Development become the index of development of country. Which of the following reasons are true with regards to this statement?

Answer: D

5 . The data of research is _____

Answer: C

6 . Which of the following is NOT the characteristic of a research?

Answer: C

7. Which of the following statement is correct?

Answer: B

8. Which of the following statement is correct?

Answer: A

9. Which of the following options are the main tasks of research in modern society?

Answer: D

10. One of the aims of the scientific method in research is to:

Answer: D

11. Which of the following is not the Method of Research?

Answer: C

12. Research ethics do not include

Answer: D

13. The first step of research is:

Answer: D

14. A research problem is feasible only when:

Answer: D

15. Authenticity of a research finding is its:

Answer: B

16. Which one of the following is a research tool?

Answer: D

17. How can the objectivity of the research be enhanced?

Answer: D

18 . Research is

Answer: A

19. In the process of conducting research ÷Formulation of Hypothesisö is followed by

Answer: B

20. A hypothesis is a

Answer: D

GLOSSARY

- **Applied / Decisional Research:** Applied research is done on the basis of pure or fundamental research to solve specific, practical questions; for policy formulation, administration and understanding of a phenomenon.
- **Bibliography:** A **bibliography** is a list of all of the sources you have used (whether referenced or not) in the process of researching your work.
- **Budgetary limitation:** Funds available guide us to decide the size, variation and quantum of samples. This fact can even lead to the use of a non-probability sample.
- **Budgeted:** Sample design must be practical and be within the limits of funds available for the research study.
- **Cluster sampling:** With cluster sampling, every member of the population is assigned to one, and only one, group. Each group is called a cluster. A sample of clusters is chosen, using a probability method (often simple random sampling). Only individuals within sampled clusters are surveyed.
- **Co relational design research:** This seeks to discover if two variables are associated or related in some way, using statistical analysis, while observing the variable. E.g. If the heat is reduced or increased during cooking how does the food react to it.
- **Conceptual research** is associated to some theoretical idea(s) or presupposition and is generally used by philosophers and thinkers to

develop new concepts or to get a better understanding of an existing concept in practice.

- **Confidentiality:** Sharing information about a respondent with others for purposes other than research is unethical. Identification of study population to put the findings into context may be important but then it has to be assured that the information provided by respondents remains anonymous.
- **Consideration of interest:** In determining the sample design, one must consider the question of the specific population structure which is of interest. E.g. we may calculate the number of walk in guests from total arrivals at a hotel on daily basis to understand the proportion and then to leave an optimum number of unreserved rooms every day for such guest.
- **Convenience Sampling:** A convenience sample consists of people who are easily approachable and can be reached out to in shorter time. Data collection is the process of gathering and measuring information on targeted variables in an established systematic fashion, which then enables one to answer relevant questions and evaluate outcomes. Data collection is a component of research in all fields of study including physical and social sciences, humanities, and business. It is a component of research in all fields of study including physical and social sciences, humanities, and business.
- **Descriptive design research:** As the name implies, it is intended to describe the present status of an issue or a problem which is analyzed based on the available data and so does not require hypothesis to begin with.

- **Descriptive Research:** This attempts to explain a situation, problem, phenomenon, service or programme, or provides information viz. living condition of a community, or describes attitudes towards an issue but this is done systematically. It is used to answer questions of who, what, when, where, and how associated with a particular research question or problem.
- **Developing a Conceptual Framework:** The researcher has to conceptualize, identify and select a broad discipline before short listing the final aspects to be studied. Then it is to find out which of these aspects generate the maximum interest and lead one to work with enthusiasm and perseverance.
- **Direct Approach:** The researcher asks direct questions about behaviors and thoughts. e.g. Why don't you eat at MacDonald?
- **Empirical research** draws together the data based on experience or observation alone, often without due regard for system and theory.
- **Empirical:** The processes adopted should be tested for the accuracy and each step should be coherent in progression. This means that any conclusions drawn are based upon firm data gathered from information collected from real life experiences or observations.
- **Error Free:** Sample design should reduce the probability of errors. The minimum numbers of errors in any sample ensure correct data obtained and analyzed.
- **Experimental design research:** This is a method used to establish a cause and effect relationship between two variables or among a group of variables. The independent variable is manipulated to observe the effect

on the depended variable. E.g. The change in response to between groups of foreigners treated to welcome drinks and freshener tissues and the one that is simply welcomed and allocated rooms in a hurry due to peak hours of check in and check out.

- **Explanatory:** is the **research** whose primary purpose is to explain why events occur, to build, elaborate, extend or test a theory. It is more concerned with showcasing, explaining and presenting what we already have.
- **Exploratory Research:** Exploration has been the human kind's passion since the time immemorial. Looking out for new things, new destinations, new food, and new cultures has been the basis of most tourist and travel journeys.
- **Generalised:** The researcher usually divides the identified population into smaller samples depending on the resource availability at the time of research being conducted. This sample is understood to be the appropriate representative of the identified population therefore the findings should also be applicable to and representative of the entire population.
- **Generalization of Results:** Sample should be such that the results of the sample study can be applied, in general, for the universe with a reasonable level of confidence.
- **Government / Official Records:** The orders passed by government and the decisions given in various cases by courts

- **Hypothesis:** A hypothesis is an informed and educated prediction or explanation about something. Part of the research process involves testing the hypothesis, and then examining the results of these tests as they relate to both the hypothesis and the world around you.
- **Inappropriate research methodology:** Any instrument or process that may be unsuitable or have negative effect on a study should be avoided. E.g. Asking respondents questions which lead to findings convenient to the researcher only.
- **Incentives:** The data collected does not need to be exchanged for a price as this deters or de-motivates the respondents to participate in a research study. Offering incentives, gifts, etc. for seeking information is unethical and equivalent to bribing.
- **Indirect Approach:** The researcher might ask: What kind of people eats at MacDonalds?
- **Intercept interviewing:** It is an integral part of tourism research. It allows researcher to reach known people in a shorter durations but at the same time it reaches out to respondents whose details are not known. The interviewer has to make an effort to gain attention and cooperation from respondents to assure apt responses. The interviews can be conducted at different locations like residences, offices, public spaces, shopping destinations etc. The interviewer uses own judgement to identify the respondents depending on convenience and may also offer some compensations if the interaction is prolonged.

- **Measurement Scales:** The greater the refinement in the unit of measurement of a variable, the greater the confidence, other things being equal, one can place in the findings.
- **Media:** Documentation done on various issues, live coverage, panel discussions etc.
- **Misrepresentation of facts:** To report the findings in a way that changes or slants them to serve your own or someone else's interest is unethical.
- **Misuse of data:** The data collected has to be used only for the purpose it is collected for not for making unethical usage. E.g. if the data of users is shared by a banking institution with an advertising company it leads to invasion of privacy and rights of the bank's clients.
- **Multistage Sampling:** In this method of sampling, we select a sample by using combinations of more than one sampling method.
- **No Bias:** Sample design should be able to control systematic bias.
- **Non-probability sampling:** Non-probability sampling is a sampling technique where the samples are gathered in a process that does not give all the individuals in the population equal chances of being selected.
- **Objective:** The objectives provide an accurate description of the specific actions you will take in order to reach the aim. An objective is measurable and operational. It tells specific things you will accomplish in your project.

- **People:** A group of individuals may be studied to understand how they behave, how they respond to a particular situation or what responses are generated when they are influenced from within or outside the group.
- **Permission or consent:** It is important for respondents to be free and under no pressure to participate in a study being conducted. The information that is sought should be first assessed to be ethical. The respondent should be able to give an informed consent. This will lead to honesty on part of the respondent and the researcher. We should inform the respondents about the type of data or information being sought, the purpose of such study, and how the respondent can get involved in the study.
- **Personal Interviewing:** It is very flexible and can also be used to collect large amounts of information. Skilled interviewers are able to keep the respondent attentive and clarify difficult questions in case of a doubt. They can guide interviews, explore issues, and probe as the situation demands. Personal interview can be used in any type of questionnaire and can be conducted fairly quickly.
- **Prejudice:** Any deliberate attempt to hide the findings of the study or highlight something disproportionately to its true existence leads to a bias or prejudice. E.g. During year end appraisal if only the shortcomings are highlighted the candidate may not be evaluated honestly. **Primary Data:** Primary data means original data that has been collected specially for the purpose in mind. It means someone collected the data from the original source first hand. Data collected this way is called primary data. The people who gather primary data may be an authorized organization, investigator, enumerator or they may be just someone with a clipboard.

Those who gather primary data may have knowledge of the study and may be motivated to make the study a success. These people are acting as a witness so primary data is only considered as reliable as the people who gathered it.

- **Primary Literature:** Primary sources means original study, based on direct observation, use of statistical records, interviews, or experimental methods, of actual practices or the actual impact of practices or policies. They are authored by researchers, contain original research data, and are usually published in a peer-reviewed journal. Primary literature may also include conference papers, pre-prints, or preliminary reports.
- **Probability Sampling Methods:** The main types of probability sampling methods are simple random sampling, stratified sampling, cluster sampling, multistage sampling, and systematic random sampling.
- **Proportional:** Sample design must result in a truly representative sample. This means that the sample selected should be exactly or almost similar to the population it represents in terms of data and characteristics.
- **Provision or deprivation of a treatment:** This may be understood as conducting an experiment without having the confidence whether it would be fruitful or otherwise for a study population. But at the same time on the other hand a constructive result may lead to wonderful results and benefits. E.g. developing a new food product for health benefits.
- **Pure / Basic / Fundamental Research:** As the term suggests a research activity taken up to look into some aspects of a problem or an issue for the first time is termed as basic or pure.

- **Qualitative research**, on the other hand, is concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind. E.g. studying the stress levels and reasons for variable performances of staff in different shifts in the same department of a hotel.
- **Quantitative research** is based on the measurement of quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity. E.g. Studying the number of enquiries received for room bookings through different modes like internet, emails, calls, letters, or different sources like travel and tours operators, companies and government organizations etc.
- **Quasi-experimental design research**: As the name suggests such an experiment is designed replicating the true experimental design, except that it does not use randomized sample groups. Also, it is used when a typical research design is not practicable.
- **Reliability**: refers to the quality of a measurement procedure that provides repeatability and accuracy. This is understood by the example of preparing the bill of purchase using a software which has inbuilt details of taxes and charges levied, the formulas to be used and a format in which it would be printed. This ensures that all the bills shall have values calculated as per standard set.

- **Research Design:** Research Design is important as it guides the researcher to identify the correct methods of data collection and analysis, conditions in which the activity of research shall be carried out and approximation of the funds to be utilized for it; maintaining its connectivity to the purpose of research. A *good research design* is characterized by its flexibility, effectiveness and suitability etc.
- **Research:** Research is a process to discover new knowledge to find answers to a question. The word research has two parts re (again) and search (find) which denote that we are taking up an activity to look into an aspect once again or we want to look for some new information about something.
- **Resources:** Literature such as books, journals, news articles, periodicals etc. may facilitate the researcher to identify a relevant problem based on the area of interest.
- **Safety of respondents:** During the course of collecting information the respondents should not be subjected to unnecessary harassment, anxiety, or putting them through experiments including hazards, discomfort, demeaning or dehumanizing procedures etc.
- **Sampling procedure:** Finally, the researcher must decide the type of sample he will use i.e., he must decide about the technique to be used in selecting the items for the sample. In fact, this technique or procedure stands for the sample design itself. An ideal design is the one that for a given sample size and for a given cost, has a smaller sampling error.

- **Sampling unit:** The sampling unit can be anything that exists within the population of interest. An assessment has to be taken with reference to a sampling unit before selecting sample. **Secondary Data:** Refers to data which is collected by someone who is someone other than the user. Common sources of secondary data for social science include censuses, information collected by government departments, organizational records and data that was originally collected for other research purposes. Secondary data analysis can save time that would otherwise be spent collecting data and, particularly in the case of quantitative data, can provide larger and higher-quality databases that would be unfeasible for any individual researcher to collect on their own. In addition, analysts of social and economic change consider secondary data essential, since it is impossible to conduct a new survey that can adequately capture past change and/or developments. However, secondary data analysis can be less useful in marketing research, as data may be outdated or inaccurate.
- **Secondary Literature:** Secondary literature consists of interpretations and evaluations that are derived from or refer to the primary source literature. Examples include review articles (such as meta-analysis and systematic reviews) and reference works. Professionals within each discipline take the primary literature and synthesize, generalize, and integrate new research. A secondary source of information is one that was created by someone who *did not* have first-hand experience or did not participate in the events or conditions being researched. They are generally accounts written after the fact with the benefit of hindsight.
- **Sensitive Information:** Certain types of information can be regarded as sensitive or confidential by some people thus asking for such information may upset or embarrass a respondent. E.g. questions on drug use,

pilferage, income, age, marital status etc. are invasive. Researcher has to be careful about the sensitivities of the participants. Any such information may be requested provided the respondent is informed and explained the purpose beforehand.

- **Size:** The sample size should be justified, not be excessively large nor it should be too small. Preferably the sample size should be optimal which fulfills the requirements of efficiency, representativeness, reliability and flexibility and representative of the population to obtain dependable outcomes. Population variance, population size, parameters of interest, and budgetary constraints are some of the factors that impact the sample size.
- **Source list:** It is also known as sampling frame from which sample is to be drawn. It contains the names of all items of a finite universe. If source list is not available, researcher has to prepare it. Such a list should be comprehensive, correct, reliable and appropriate. It is extremely important for the source list to be as representative of the population as possible.
- **Stratified sampling:** With stratified sampling, the population is divided into groups, based on some characteristic. Then, within each group, a probability sample (often a simple random sample) is selected. In stratified sampling, the groups are called strata.
- **Structured Surveys:** Using formal lists of questions asked to all respondents in an identical set.
- **Systematic Random Sampling:** This begins with creation of a list of each member of the population. From the list, we randomly select the first sample element from the first k elements on the population list.

Thereafter, we select every k th element on the list. Type of universe: The accuracy of the results in any study depends on how clearly the universe or population of interest is defined. The universe can be finite or infinite, depending on the number of items it contains.

- **Tertiary Literature:** Tertiary literature consists of a distillation and collection of primary and secondary sources such as textbooks, encyclopedia articles, and guidebooks or handbooks.
- **The interval scale:** An interval scale has all the characteristics of an ordinal scale. In addition, it uses a unit of measurement with an arbitrary starting and terminating points.
- **The nominal or classificatory scale:** A nominal scale enables the classification of individuals, objects or responses into subgroups based on a common/shared property or characteristic. A variable measured on a nominal scale may have one, two or more subcategories depending upon the extent of variation.
- **The ordinal or ranking scale:** Besides categorizing individuals, objects, responses or a property into subgroups on the basis of common characteristic, it ranks the subgroups in a certain order.
- **The ratio scale:** A ratio scale has all the properties of nominal, ordinal and interval scales plus its own property: the zero point of a ratio scale is fixed, which means it has a fixed starting point. Since the difference between intervals is always measured from a zero point, this scale can be used for mathematical operations. The measurement of variables like

income, age, height and weight are examples of this scale. A person who is 40 year old is twice as old as one who is 20 year old.

- **Unstructured Surveys:** The interviewer probes the respondents and guides the interview according to their answers. E.g. Debates on political issues on Television Channels.
- **Validity** means that correct procedures have been applied to find answers to a question. If a large plot of land has to be measured the results should be same whether we use a meter scale or a measuring tape once we put the values obtained; in the **formula** being used to calculate the area.
- **Variable:** An image, perception or concept that can be measured; hence capable of taking on different values- is called a variable. A variable is also defined as anything that has a quantity or quality that varies.
- **Voluntary Sampling:** This constitutes of people who have keen interest in the topic of survey being conducted and are themselves getting involved to contribute as respondents.

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Further Reading

Researching for Hospitality and Tourism Management

<https://www.uou.ac.in/sites/default/files/slm/BHM-503T.pdf>

A good research report has the following functions: (**Bhim Chimoriya**-March 09, 2017)

1. To provide the information regarding the findings of research work i.e. methods, data analysis, conclusion and so on in the systematic, scientific and accepted way.
2. To elicit crucial facts for solution derived and decision making.
3. To prove the worth and legitimacy of assigned research job.
4. To provide the judgement tools for the judgement of quality and talent of researcher within and outside the academia.
5. To communicate the research findings professionally.
6. To pertain the credibility of the research.
7. To develop appreciation of standards, consolidate arguments and identify the knowledge gaps.

Technical Report: In the technical report the main emphasis is on the methods employed, assumptions made in the course of the study and the detailed presentation of the findings including their limitations and supporting data. E.g, the project reports when a hotel is being conceptualised.

Formal or Informal Reports: A formal report has a carefully drafted structure, clear objectives, is organized and has sufficient details to let the reader understand the concepts. These are written using non personal elements whereas an informal report can be direct, short with casual language e.g. an inter-office communication via a notice or memorandum.

Popular Report: The highlights of this report are simplicity and attractiveness. The simplification is done by clear writing, minimization of technical, particularly mathematical, details and liberal use of charts and diagrams. Attractive layout along with large print, many subheadings, even an occasional figurine is another characteristic feature of the popular report.

Informational or Analytical Reports: Informational reports (annual reports, monthly financial reports, and reports about personnel) carry objective information from one area of an organization to another. Analytical reports (scientific research, feasibility reports, and real-estate appraisals) present attempts to solve problems.

Proposal Report: The proposal is a variation of problem-solving reports. A proposal is a document prepared to describe how one organization can meet the needs of another. Most governmental agencies advertise their needs by issuing requests for proposal or RFPs. The RFP specifies a need and potential suppliers prepare proposal reports telling how they can meet that need.

Vertical or Lateral Reports: Any reports that move upward or downward the hierarchies are referred to as vertical reports; such reports contribute to management control. Lateral reports, on the other hand, assist in coordination in the organization. A report traveling between units of the same organization level (production and finance departments) is lateral.

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Internal or External Reports: Internal reports are circulated within the organization e.g. the reports circulated in the morning meeting of managers at a hotel. External reports, such as annual reports of companies, are prepared for distribution outside the organization e.g. a report showing the growth, popularity of a hotel brand in comparison to others.

Periodic Reports: The reports generated on scheduled intervals for guiding the management to exercise better control. The format is unusually pre-printed and system generated so that they are uniform in nature.

Functional Reports: This classification includes accounting reports, marketing reports, financial reports, and a variety of other reports that take their designation from the ultimate use of the report. Almost all reports could be included in most of these categories. And a single report could be included in several classifications.

- i. Preprinted Form: These are like fill in the blank** reports, relatively short (five or fewer pages) and deal with routine information, mostly numerical information.
- ii. Letter:** Shorter reports that are aimed to develop an understanding in the people outside the organization. These reports include all the

3. Acknowledgements: In this section the researcher may acknowledge Institution Head, Faculty Guides, research participants, friends etc.
4. Introduction This section introduces the research setting out aims and objectives. It includes a rationale for the research.
5. Chapter I Theoretical Framework and Review of Related Literature
6. Chapter II Research Design
7. Chapter III Data Analysis and Interpretation
8. Chapter IV Summary and Conclusion
9. Suggestions/ Recommendations for Further Research
10. References/ Bibliography
11. Appendices
12. Appendix I Questionnaire for Employees
13. Appendix II Questionnaire for Managers
14. List of Tables: This section includes title and page number of all tables.

Table No.	Title	Page No.
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15. Details about respondents (Demographic, Economical, Geographical, etc. relevant to justify the data collected for study).

16. List of Figures: This section contains title and page number of all graphs, pie charts etc.

Figure No.

Title

Page No.