



## Research Methodology

Research methodology involves the systematic procedures by which the researcher starts from the initial identification of the problem to its final conclusions. The role of the methodology is to carry on the research work in a scientific, and valid manner. The method of research provides the tools and techniques by which the research problem is attacked. The methodology consists of procedures and techniques for conducting a study. Research procedures are of little value unless they are used properly. The tools and techniques will not get the work done. The proper use of research method must be learned by the researcher

Research methodology involves such general activities as identifying problems, review of the literature, formulating hypotheses, procedure for testing hypotheses, measurement, data collection analysis of data, interpreting results and drawing conclusions. Thus, research methodology consists of all general and specific activities of research. Mastery of the research methodology invariably enhances understanding of the research activities. Thus, it seems that research design and methodology have the same meaning, i.e., mapping strategy of research (Singh, 2006, p.79).

### Question 25. Distinction Between Research Methods And Research Methodology?

**Answer :**

Research Methods	Research Methodology
<p>Research methods are the various procedures, schemes, algorithms, etc. used in research. All the methods used by a researcher during a research study are termed as research methods. They are essentially planned, scientific and value-neutral. They include theoretical procedures, experimental studies, numerical schemes, statistical approaches, etc. Research methods help us collect samples, data and find a solution to a problem. Particularly, scientific research methods call for explanations based on collected facts, measurements and observations and not on reasoning alone. They accept only those explanations which can be verified by experiments.</p>	<p>Research methodology is a systematic way to solve a problem. It is a science of studying how research is to be carried out. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology. It is also defined as the study of methods by which knowledge is gained. Its aim is to give the work plan of research.</p>

## Meaning of Research

Research refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. It is an art of scientific investigation. The Advanced Learner's Dictionary of Current English (1952, p.1069) lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge." Redman and Mory (1923, p.10) define research as a "systematized

effort to gain new knowledge.” Some people consider research as a movement, a movement from **the known to the unknown**. It is actually a voyage of discovery. Research is an academic activity and as such the term should be used in a technical sense.

According to Clifford Woody (as cited in Kothari, 2004, p.1) 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.

Slesinger and Stephenson (as cited in the Encyclopaedia of Social Sciences, 1930.) defined research as “the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art.”

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 solutions to a problem is research*.

The term ‘research’ refers to *the systematic method consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analyzing the facts and reaching certain conclusions either in the form of solutions(s) towards the concerned problem or in certain generalizations for some theoretical formulation*.

Research is defined as a careful consideration of study regarding a particular concern or a problem using scientific methods. According to the American sociologist Earl Robert Babbie, “Research is a systematic inquiry to describe, explain, predict and control the observed phenomenon. Research involves inductive and deductive methods.”

Inductive research methods are used to analyze the observed phenomenon; **they** are associated with **qualitative** research; whereas, deductive methods are used to verify the observed phenomenon. And they are more commonly associated with **quantitative** research. Research simply seeks the answer of certain questions which have not been answered so far and the answers depend upon human efforts. It may be illustrated by taking an example of the moon. Some years ago a man did not know what exactly the moon is? Was this problem which had no solution? Man could only make some assumptions about it, but the man now this time by his efforts, he went to the moon brought the soil of the moon and studied it. The man is now able to give concrete answers of the problem what is the moon? But the question arises, “Is the answer of the question in examination also research”? The answer is ‘no’, because the answers of these questions are available. They are available in text-books, class-notes, etc. Research answers only those questions of which the answers are not available in literature i.e., in human knowledge.

Thus, we can say research seeks the answer only of those questions of which the answers can be given on the basis of available facilities (Singh, 2006, p.1).

According to some researchers (as cited in Singh, 2006, pp.1–4)

### **Rusk**

Research is a point of view, an attitude of inquiry or a frame of mind. It asks questions which have hitherto not been asked, and it seeks to answer them by following a fairly definite procedure. It is not a mere theorizing, but rather an attempt to elicit facts and to face them once they have been assembled. Research is likewise not an attempt to bolster up pre-conceived opinions, and it implies a readiness to accept the conclusions to which an inquiry leads, no matter how unwelcome they may prove. When successful, research adds to the scientific knowledge of the subject.

### **George J. Mouly**

The systematic and scholarly application of the scientific method interpreted in its broader sense, to the solution of social studiesal problems; conversely, any systematic study designed to promote the development of social studies as a science can be considered research.

### **Francis G. Cornell**

To 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 behavior, an activity in which people engage. By this definition all intelligent human behavior involves some research. In social studies, teachers, administrators, or others engage in 'Research' when they systematically and purposefully assemble information about schools, school children, the social matrix in which a school or school system is determined, the characteristic of the learner or the interaction between the school and pupil.

### **Clifford Woody of the University of Michigan**

Research is a careful inquiry or examination in seeking facts or principles; a diligent investigation to ascertain something, according to Webster's New International Dictionary. This definition makes clear the fact that research is not merely a search for truth, but a prolonged, intensive, purposeful search. In the last analysis, research 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 deductions and reaching conclusions; and at last, carefully testing the conclusions to determine whether they fit the formulating hypotheses.

### **Crawford**

Research is simply a systematic and refined technique of thinking, employing specialized tools, instruments, and procedures in order to obtain a more adequate solution of a problem than would be possible under ordinary means. It starts with a problem, collects data or facts, analysis these critically and reaches decisions based on the actual evidence. It evolves original work instead of mere exercise of personal. It evolves from a genuine desire to know rather than a desire to prove something. It is quantitative, seeking to know not only what but how much, and measurement is; therefore, a central feature of it.

### **Francies Rummel**

Research is an endeavor to discover, develop and verify knowledge. It is an intellectual process that has developed over hundreds of years, ever changing in purpose and form and always searching for truth.

**Cook** has given a very comprehensive and functional definition of the term research

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

He has emphasized the following characteristics of research in his definition:

1. It is an honest and exhaustive process.
2. The facts are studied with understanding.
3. The facts are discovered in the light of the problem. Research is problem-centred.
4. The findings are valid and verifiable.
5. Research work should contribute new knowledge in that field.

### **Monroe**

Research may be defined as a method of studying problems whose solutions are to be derived partly or wholly from facts. The facts dealt with in research may be statements of opinion, historical facts, those contained in records and reports, the results of tests, answers to questionnaires, experimental data of any sort, and so forth. The final purpose of research is to ascertain principles and develop procedures for use in the field of social studies; therefore, it should conclude by formulating principles or procedures. The mere collection and tabulation of facts is not research, though it may be preliminary to it on eve a part thereof.

## **Hutchins**

Research in the sense of the development, elaboration, and refinement of principles, together with the collection and use of empirical materials to aid in these processes, is one of the highest activities of a university and one in which all its professors should be engaged.

## **McGrath and Watson**

Research is a process which has utility to the extent that class of inquiry employed as the research activity vehicle is capable of adding knowledge, of stimulating progress and helping society and man relate more efficiently and effectively to the problems that society and man perpetuate and create.

### **Characteristics of Research**

The following characteristics may be gathered from the definitions of 'Research'

1. It gathers new knowledge or data from primary or first-hand sources.
2. It places emphasis upon the discovery of general principles.
3. It is an exact systematic and accurate investigation.
4. It uses certain valid data gathering devices.
5. It is logical and objective.
6. The researcher resists the temptation to seek only the data that support his hypotheses.
7. The researcher eliminates personal feelings and preferences.
8. It endeavors to organize data in quantitative terms.
9. Research is patient and unhurried activity.
10. The researcher is willing to follow his procedures to the conclusions that may be unpopular and bring social disapproval.
11. Research is carefully recorded and reported.
12. Conclusions and generalizations are arrived at carefully and cautiously.

Other characteristics of research are listed below:

1. A systematic approach is followed in research. Rules and procedures are an integral part of research that set the objective of a research process. Researchers need to practice ethics and code of conduct while making observations or drawing conclusions.
2. Research is based on logical reasoning and involves both inductive and deductive methods.
3. The data or knowledge that is derived is in real time, actual observations in the natural settings.
4. There is an in-depth analysis of all the data collected from research so that there are no anomalies associated with it.

5. Research creates a path for generating new questions. More research opportunity can be generated from existing research.
6. Research is analytical in nature. It makes use of all the available data so that there is no ambiguity in inference.
7. Accuracy is one of the important character of research, the information that is obtained while conducting the research should be accurate and true to its nature. For example, research conducted in a controlled environment like a laboratory. Here accuracy is measured of instruments used, calibrations, and the final result of the experiment.

### **Objectives of Research**

The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, we may think of research objectives as falling into a number of the 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 formulative 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). (Kothari, 2004, p. 2)

Furthermore, research is conducted with a purpose to understand:

1. What do organizations or businesses really want to find out?
2. What are the processes that need to be followed to chase the idea?
3. What are the arguments that need to be built around a concept?
4. What is the evidence that will be required that people believe in the idea or concept?

## Types of Research

The basic types of research are:

### **Basic Research**

Basic research is mostly conducted to enhance knowledge. It covers fundamental aspects of research. The main motivation of this research is knowledge expansion. It is a non-commercial research and doesn't facilitate in creating or inventing anything. For example, an experiment is a good example of basic research.

### **Applied Research**

Applied research focuses on analyzing and solving real-life problems. This type of research refers to the study that helps solve practical problems using scientific methods. This research plays an important role in solving issues that impact the overall well-being of humans. For example, finding a specific cure for a disease.

### **Problem Oriented Research**

As the name suggests, problem-oriented research is conducted to understand the exact nature of the problem to find out relevant solutions. The term "problem" refers to having issues or two thoughts while making any decisions.

For e.g Revenue of a car company has decreased by 12% in the last year. The following could be the probable causes: There is no optimum production, poor quality of a product, no advertising, economic conditions etc.

### **Problem Solving Research**

This type of research is conducted by companies to understand and resolve their own problems. The problem-solving research uses applied research to find solutions to the existing problems. Research has threefold objectives: Theoretical, factual and application. These objectives are achieved by employing different methods and strategies of research. A research scholar should know the meaning of the term method and strategy of research. In short, the term research can be viewed in a process form, which will be explained next.

### **Levels of Conducting Research**

In actual practice, research is conducted at different levels and for different immediate purposes. The level at which a person operates in the field depends on the objectives he intends to accomplish.

Generally, research has two levels:

1. Basic level and
2. Applied level.

### Basic Level

Trevers (as cited in Singh, 2006, p.8) has defined basic level as basic research. It is designed to add an organized body of scientific knowledge and does not necessarily produce results of immediate practical value.

### Applied Level

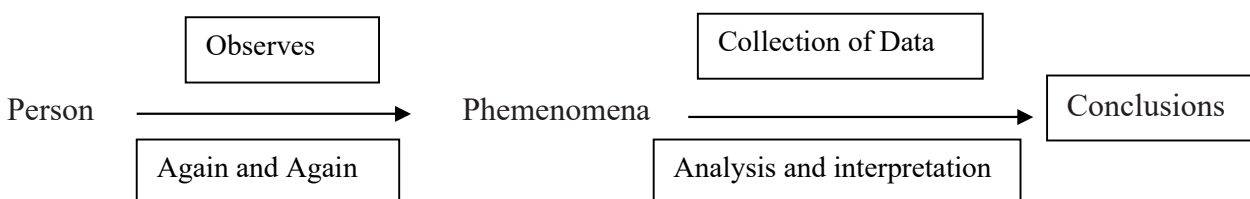
Applied research is undertaken to solve an immediate practical problem and the goal of adding to scientific knowledge is secondary. A common mistake is to assume that levels differ according to complexity and that basic research tends to be complex and applied research. Some applied research is quite complex and some basic research is rather simple (Singh, 2006, p.8).

## Research Process

The term 'Research' consists of two words:

Research = Re + Search

'Re' means again and again and 'Search' means to find out something, the following is the process:



Therefore, research means to observe the phenomena again and again from different dimensions. For example, there are many theories of learning due to the observation from different dimensions. Research is a process of which a person observes the phenomena again and again and collects the data and on the basis of data he draws some conclusions.

Research is oriented towards the discovery of the relationship that exists among phenomena of the world in which we live. The fundamental assumption is that a variant relationship exists between certain antecedents and certain consequents so that under a specific set of conditions a certain consequent can be expected to follow the introduction of a given antecedent (Singh, 2006, p.2).



## **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:

1. Desire to get a research degree with its consequential benefits;
2. Desire to face challenge in solving unsolved problems;
3. Desire to get intellectual joy of doing more creative work;
4. Desire to be of service to society; and
5. Desire to get respectability

However, this is not an exhaustive list of factors motivating people to undertake research studies. Many more factors, such as: directives of government, employment conditions; curiosity about new things; desire to understand causal relationships, social thinking and awakening, and the like may as well motivate people to perform research operation (Kothari, 2004, p.2).

## Method

### Meaning of Method

Method is a style of conducting a research work which is determined by the nature of the problem. Verma (as cited in Sengh, 2006, p.99) has defined the term method in the following manner-

“Method is only in the abstract as logical entities that we can distinguish between matter and methods, in reality, they form an organic whole and matter determines method analogously as objective determines means and content and spirit determine style and form in literature.”

He has presented a broad meaning of the term method. According to him matter is important for determining method. The common types of matter may be three types, hence all the methods can be classified under three heads;

- Theoretical problem – survey, experimental method.
- Factual problem – Historical, case study, and genetic methods.
- Application problem – Action Research.

Broudy (1963, as cited in Singh, 2006) stated that “Method refers to the formal structure of the sequence of acts commonly denoted by instruction. The term method covers both strategy and tactics of teaching and involves the choice of what is to be taught, and the order in which it is to be taught.”

Method is more general, it includes techniques also. The research techniques are ways of implementing a method. Different techniques may be employed within the same method.

Webster defined methodology as “the science of method or arrangement” which is not a particularly useful definition. Method is defined as “orderliness and regularity or habitual practice of them in action”. By placing stress on “arrangement”, orderliness, regularity and habitual practice, the methodologies derive their substance essentially from the classically ideal controlled experiments which permeates rightly or; otherwise, the literature of educational research. The methodology means with reference to research that it is a type of inquiry (Sengh, 2006, p.99).

### Definition of Strategy

The term research strategy has been defined in the following manner:

Research strategy is a generalized plan for a problem which includes structure, desired solution in terms objectives of research and an outline of planned devices necessary to implement the strategy. The research strategy is a part of a larger development scheme of research’ approach. (Sengh, 2006, p.99)

The term ‘strategy’ has been borrowed from military science. It refers to the objectives of research. The objectives of research work determine the strategy. A generalized plan for realizing

the objective is known as research strategy, which **is based on the objective of research**, while **research method is based on the nature of the research problem. The same method of research may be called as research strategy**, if it is determined by considering the objective of research. In the recent literature research strategy is now being used (Sengh, 2006, pp.99–100).

### Scientific Thinking

In social sciences, a research work is often oriented towards the solution of a problem or to seek an answer of a question. The first step of this process is to identify a problem. To do this, a researcher is required to use scientific thinking. But, what is scientific thinking?

Scientific thinking is usually defined as an inductive-deductive mode of thinking or reasoning. In this sense, induction is to move from particular to general; whereas, deduction is backward. It is to move from general to particular. Ultimately, in such a mode, a researcher is expected to explain the uniformities of nature by appealing to experiences.

The scientific thinking starts with facts and continually returns to facts to test and verify its hypotheses. It often aims to establish the relationships between the variables through evidences. The sources of these evidences are based on some methods. Examples of these methods are customs and traditions, authority, personal experiences, self-evident, proposition, and scientific inquiry (Singh, 2006, as cited in Hoadjli, 2016, pp.12–13).

### The Scientific Method

By this method, the researcher acquire knowledge through empirical investigation conducted according to laid down and well-defined rules and procedures for collecting, analyzing and evaluating information (also called data). The scientific method involves the application of the rules of science in the search for knowledge. Thus, they get to know because widely accepted scientific procedures lead us to know (Agbaje, A., & Alarape, p.6).

The scientific method is a general set of procedures or steps through which the systematic approach is developed. The scientific method and systematic approach are synonymous. It is a more specific research process. A series of steps are used in the scientific method of research.

### Steps of the Scientific Method

- **The initial step** of the scientific method that of observing some phenomenon represents an insight into some experience. The need to resolve the problem is felt and the individual prepares to do something about the need.
- **The second step** is to Identify the problem more precisely. It involves the formulation of hypotheses based on an observed phenomenon.
- **The third step** of the scientific method is to develop and apply a design for the solution of the problem and testing the hypotheses.

- **The fourth step** usually identified is a continuation of the third step - that continued testing hypotheses. Results are subject to further analyses and tests.
- **The final step** is that of drawing conclusions based on data and“ tests and integrating these conclusions with the existing body of knowledge (Sengh, 2006, p.100).

### **Characteristics The Scientific Method**

Characteristics of the method include the following:

- It produces/validates knowledge with reference to standards and procedures that are largely external to the individual, are more or less permanent, and are not affected by human thinking.
- It is a critical method.
- It is a systematic and controlled method.
- It is empirical, grounded in observation and experience.
- The scientific method allows for replication..
- The scientific method is self-correcting.
- Finally, the ultimate goal of the method is to seek explanation, rather than mere description. It seeks to answer the “why” question (Agbaje, A., & Alarape, p.7).

## Lecture Four: Classification of Methods

The purpose of research work is to examine the phenomena. It can be studied by employing either of research approach. There are two approaches of research:

### Longitudinal Approach

Which is concerned with complete information of the phenomenon from its genesis up to its fruit. This is the time sense approach. Longitudinal research is a type of correlational research that cases, longitudinal studies can last several decades.

### How Long is a Longitudinal Approach?

No set amount of time is required for a longitudinal study, so long as the participants are repeatedly observed. They can range from as short as a few weeks to as long as several decades. However, they usually last at least a year, oftentimes several.

### Benefits of Longitudinal Approach

For many types of research, longitudinal studies provide unique insight that might not be possible any other way. This method allows researchers to look at changes over time. Because of this, longitudinal methods are particularly useful when studying development and lifespan issues. Researchers can look at how certain things may change at different points in life and explore some of the involves looking at variables over an extended period of time. This type of study can take place over a period of weeks, months, or even years. In some reasons why these developmental shifts take place.

Longitudinal studies allow researchers to follow their subjects in real time. This means you can better establish the real sequence of events, allowing you insight into cause-and-effect relationships.

Longitudinal studies also allow repeated observations of the same individual over time. This means any changes in the outcome variable cannot be attributed to differences between individuals. Prospective longitudinal studies eliminate the risk of recall bias, or the inability to correctly recall past events.

### Drawbacks of Longitudinal Approach

As with other types of psychology research, longitudinal studies have strengths and weaknesses. There are some important advantages to conducting longitudinal research, but there are also a number of drawbacks that need to be considered.

Longitudinal studies can be expensive. It requires enormous amounts of time and are often quite expensive. Because of this, these studies often have only a small group of subjects, which makes it difficult to apply the results to a larger population.

Participants tend to drop out over time. Another problem is that participants sometimes drop out of the study, shrinking the sample size and decreasing the amount of data collected. This tendency is known as selective attrition. Participants might drop out for a number of reasons, like moving away from the area, illness, or simply losing the motivation to participate (Cherry, 2020).

### **Methods Employed in this Approach**

This approach employs three methods of research that will be explained later on:

- (a) Historical method,
- (b) Genetic method, and
- (c) Case study method.

These types will be explained thoroughly next lectures.

### **Cross-sectional Approach**

#### **Definition**

A cross-sectional study is a type of research design in which you collect data from many different individuals at a single point in time. In cross-sectional research, you observe variables without influencing them. It is concerned with the information of any aspect of the phenomenon in the existing situation. This approach employs the following three methods

- (a) Survey method,
- (b) Experimental method, and
- (c) Casual comparative method or Ex-post facts method(see details in the coming sections).

#### **When to use a cross-sectional design?**

When you want to examine the prevalence of some outcome at a certain moment in time, a cross-sectional study is the best choice. Sometimes a cross-sectional study is the best choice for practical reasons – for instance, if you only have the time or money to collect cross-sectional data, or if the only data you can find to answer your research question was gathered at a single point in time. As cross-sectional studies are cheaper and less time-consuming than many other types of study, they allow you to easily collect data that can be used as a basis for further research.

### **Advantages and disadvantages of cross-sectional studies**

Like any research design, cross-sectional studies have various benefits and drawbacks.

#### **Advantages**

1. Because you only collect data at a single point in time, cross-sectional studies are relatively cheap and less time-consuming than other types of research.
2. Cross-sectional studies allow you to collect data from a large pool of subjects and compare differences between groups.
3. Cross-sectional studies capture a specific moment in time. National censuses, for instance, provide a snapshot of conditions in that country at that time.

#### **Disadvantages**

1. It is difficult to establish cause-and-effect relationships using cross-sectional studies, since they only represent a one-time measurement of both the alleged cause and effect.
2. Since cross-sectional studies only study a single moment in time, they cannot be used to analyze behavior over a period of time or establish long-term trends.
3. The timing of the cross-sectional snapshot may be unrepresentative of behavior of the group as a whole. For instance, imagine you are looking at the impact of psychotherapy on an illness like depression. If the depressed individuals in your sample began therapy shortly before the data collection, then it might appear that therapy causes depression even if it is effective in the long term.

### **Methods Employed in this Approach**

George J. Mouly (as cited in Sengh, 2006 p.101) has classified research methods into three basic types: Survey, historical and experimental methods. The meanings and their further classification have been given in the following paras:

#### **Purpose of Descriptive Research**

The following are the main objectives of descriptive research:

- a. To identify present conditions and point to present needs.
- b. To study immediate status of a phenomenon.
- c. Facts findings.
- d. To examine the relationships of traits and characteristics (trends and patterns).

The descriptive survey is more realistic than experimental research. Descriptive research is oriented towards the descriptive of the present status of a given phenomenon.

#### **Basic Types of Descriptive Research Methods**

One of the goals of science is description (other goals include prediction and explanation). Descriptive research methods are pretty much as they sound they *describe* situations.

They do not make accurate predictions, and they do not determine cause and effect. There are three main types of descriptive methods: observational methods, case-study methods and survey methods. This article will briefly describe each of these methods, their advantages, and their drawbacks. This may help you better understand research findings, whether reported in the mainstream media, or when reading a research study on your own.

### **Observational Method**

With the observational method (sometimes referred to as field observation) animal and human behavior is closely observed. There are two main categories of the observational method – **naturalistic observation and laboratory observation.**

The biggest advantage of the naturalistic method of research is that researchers view participants in their natural environments. This leads to greater ecological validity than laboratory observation, proponents say.

Ecological validity refers to the extent to which research can be used in real-life situations. Proponents of laboratory observation often suggest that due to more control in the laboratory, the results found when using laboratory observation are more meaningful than those obtained with naturalistic observation.

Laboratory observations are usually less time-consuming and cheaper than naturalistic observations. Of course, both naturalistic and laboratory observations are important in regard to the advancement of scientific knowledge.

### **Case Study Method**

Case study research involves an in-depth study of an **individual or group of individuals.** Case studies often lead to testable hypotheses and allow us to study rare phenomena. Case studies **should not be used to determine cause and effect**, and they have limited use for making accurate predictions.

There are two serious problems with case studies: **expectancy effects and atypical individuals.** Expectancy effects include the experimenter's underlying biases that might affect the actions taken while conducting research. These biases can lead to misrepresenting participants' descriptions. Describing atypical individuals may lead to poor generalizations and detract from external validity.

### **Archival Research Method**

This type of descriptive research study as a method uses existing data or records to answer a research question. It involves **content and qualitative analysis** of research material. Archived data like the U.S. Census, economic and political surveys can be used to reach a research conclusion. For example, the data could also be used to determine how the number of women taking up the role of breadwinner in America has increased over the decades and reasons behind the statistical changes.



## Survey Method

In survey method research, participants answer questions administered through interviews or questionnaires. After participants answer the questions, researchers describe the responses given. In order for the survey to be both reliable and valid, it is important that the questions are constructed properly. Questions should be written so they are clear and easy to comprehend. Another consideration when designing questions is whether to include open-ended, closed-ended, partially open-ended, or rating-scale questions (for a detailed discussion refer to Jackson, 2009). Advantages and disadvantages can be found with each type:

Open-ended questions allow for a greater variety of responses from participants but are difficult to analyze statistically because the data must be coded or reduced in some manner. Closed-ended questions are easy to analyze statistically, but they seriously limit the responses that participants can give. Many researchers prefer to use a Likert-type scale because it's very easy to analyze statistically. (Jackson, 2009, p. 89)

In addition to the methods listed above some individuals also include qualitative (as a distinct method) and archival methods when discussing descriptive research methods. It is important to emphasize that descriptive research methods can only *describe* a set of observations or the data collected. It cannot draw conclusions from that data about which way the relationship goes — Does A cause B, or does B cause A?

Unfortunately, in many studies published today, researchers forget this fundamental limitation of their research and suggest their data can actually demonstrate or “suggest” causal relationships. Nothing could be further from the truth.

In short, a survey method is concerned with the present and attempts to determine the status of the phenomena under investigation. This method has been further classified into four categories: (a) Descriptive (b) Analytical (c) School survey and (d) Genetic.

(a) Descriptive survey is of three types:

- a1–Survey testing method,
- a2–Questionnaire survey method,
- a3–Interview survey method.

(b) Analytical survey is of five types:

- b1–Documentary frequency,
- b2–Observational survey,
- b3–Rating survey,
- b4–Critical incident,
- b5–Factor analysis.

(c) School survey and

(d) Genetic survey.

**(a) Descriptive and Historical research**

A clear distinction can be drawn between survey studies and historical studies on the basis of time, the latter deals with past, the former with present.

**(b) Descriptive and Experimental research**

Descriptive research as are oriented toward the determination of **the status** of a given phenomenon rather than toward the isolation of causative factors accounting for its existence. It is based on cross sectional samples, the sample should be representative of the population. Descriptive research involves **large sample** and experimental research includes **small sample**. Descriptive research investigates trend of characteristics of population. This is less scientific and sophisticated.

## Approaches of Research

### Qualitative Approach

Qualitative research approach is well thought out to be particularly suitable for gaining an in-depth understanding of the underlying reasons and motivations. It means that qualitative methods focus on the informant's perspective and opinions. It is harder, more time consuming and more demanding and stressful. Denzine and Lincoln (2005, p.3) described qualitative research as a study which involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them. That is to say, qualitative approach is related to the human problems and the data is gathered from the real world setting, and analyzed inductively which enables and allows the researcher to collect reliable and flexible data to help better understanding any topic under investigation.

### Quantitative Approach

Unlike the qualitative research, the central purpose of quantitative research is the quantification of data. In this line of thought, Creswell (1994, p.13) described the quantitative research as the kind of study that is: "explaining phenomena by collecting data that are analyzed mathematically based methods (in particular statistics)." It takes for granted a fixed and measurable reality and is concerned with finding out facts about social phenomena. In a similar context, Best and Khan (1998, pp.89-90) stated that "quantitative research consists of those studies in which the data concerned can be analyzed in terms of numbers." This means that the data is statistically shaped.

### Mixed-methods Approach

The real breakthrough in combining qualitative and quantitative research occurred in the 1970's. The mixed-method approach was first introduced with the adoption of the concept of 'triangulation' into social sciences.

In applied linguistics, over the period between 1995-2005 applied linguists called on for more engagement in the practice of a mixed-methods approach as the suitable research methodology wherein quantitative and qualitative methods are mixed since such a practice can offer possible solutions for the studied research problems.

### Main Characteristics of Mixed-methods Approach

In below, some characteristic features of the mixed-methods research are stated:

1. Expanding the understanding of a complex issue: A mixed-methods approach would broaden the scope of the investigation and enrich the researchers' ability to draw conclusions about the problem under study.

2. Corroborating findings through 'triangulation': The use of different data sources, investigators, theories, or research methods generates multiple perspectives on a phenomenon. Such an effective strategy ensures research validity.
3. Reaching multiple audiences: Because of the combination of the methods in mixed – methods research, the final results can be more palatable for certain audiences than outcomes of a monomethod study.

### **Strengths and Weaknesses of Mixed-method**

According to research methodologists, several arguments have been put forward about the value of mixed-methods research. This study can bring out the best of qualitative and quantitative researches. This is further argued by the potential that the strengths of one method can be utilised to overcome the weaknesses of another method used in the study. In addition, a mixed-methods research has a potential to produce evidence for the validity of research outcomes through the convergence and corroboration of the findings. Contrarily, some proponents view that one cannot help wondering whether there is really a principled approach to guiding the variety of combinations so that we do not end up with a deficient research approach (Dörnyei, 2007).

## Experimental Method

### Definition

It is oriented towards the discovery of basic relationship among phenomena as a means of predicting and eventually, controlling their occurrence. Experimental method is a scientific method. It is oriented to the future in the sense that the researcher is seeking to evaluate something new. It is a process of contributing to the already acquired fund of knowledge. Thus, the experimenter operates under the basic assumption that the research situation he wishes to evaluate has never existed and does not now exist. Situation, here, means in the sense of a program, curriculum, or method for organizing class, as well as a 'situation' created to test.

### Concept of Cause and Effect

The main focus and scientific study is to analyze the **functional relationship** of the variables. The functional relationship refers to the cause and effect relation between the variables. The cause and effect relationship can be studied by applying the 'Law of Single Variable'. A researcher wants to study the effectiveness of a new teaching strategy, i.e., programmed instruction. For this purpose two equivalent groups are selected, one group will be taught through **new strategy** or programmed instruction and another group with lecture method. Same content will be taught and same criterion test or achievement test will be administered on both groups. The performance of programmed instruction group is significantly higher than that of lecture method group. It may be concluded that programmed instruction strategy is **effective than** the lecture method, because the performance of experimental group is caused by the new strategy of teaching or programmed instruction treatment.

### Meaning and Definition of Variables

On the experimental study, the main functioning proceeds around the variables. To see the cause and effect is the main focus of this study and the further question "Of what" gives the word 'Variable'. To see the effect of these variables is the purpose of experimental study. "A variable is a property that takes on different value." A variable is any feature or aspect of an event, function or process that, by its presence and nature, affects some other event or process, which is being studied.

A variable, as its name indicates, is a value that does not stand constant when exposed to influence (Nunan, 1999). He went on to add that often, researchers look at the relationship a variable as a teaching method and another measuring variable such as scores on formal tests. It is agreed that any experimental research is conducted to explore the solid relationship between variables.

## **Types of Variables**

The variables can be classified in various ways, but three types of variables are employed in conducting an experiment in education:

1. Experimental Variable or Independent Variable (IDV).
2. Controlled Variable.
3. Criterion Variable or Dependent Variable (DV).

### **Experimental Variable**

An experiment is conducted to examine the effect of a variable or treatment which is known as an experimental variable. The main attention is given in the experiment to observe its effect. The programmed instruction strategy may be an experimental variable.

### **Controlled Variable**

The effectiveness is a relative term; therefore, the effectiveness of an experimental variable is examined by comparing with other variable which is known as controlled variable. The effectiveness of programmed instruction strategy is studied by comparing with the lecture or traditional method of teaching. **The lecture method is the controlled variable.** The control group subjects should not get the exposure of the experimental variable.

### **Criterion Variable or Dependent Variable**

The basis on which the effectiveness of the experimental variable is established or studied is known as the criterion variable. The achievement may be the criterion or dependent variable. The learning outcomes or achievement or change of behavior are usually the criterion variable in education or psychology. If we want to study the effectiveness of schedules of reinforcement, it will be examined in terms of student achievement through different schedules of reinforcement. The student achievement is the criterion variable.

### **Intervening Variable**

There are a number of abstract variables in educational experiment which intervene the effect of experimental variable on criterion variable. The learners' attitudes, motivation and learning process are the intervening variables. A researcher should be careful about intervening variables in conducting an experiment to obtain the true effect of the treatment.

### **Extraneous Variables**

Some of the extraneous variables that may hamper the experimental process and may threaten the study validity, which are difficult to control.

**History.** It refers to the time span between the pre and posttests. The longer the period between the first and second measurement of the dependent variable, the greater the effect of history on that variable. The changes that occur in the individual as a result of the passage of time are called 'maturation' and these may have an effect on the dependent variable too.

**Instrumentation.** It is defined by Christensen (1980, p.97) as “... it refers to changes that occur over time in the measurement of the dependent variable”, for example different human observers that are used in an experiment may threaten its validity. When we talk about instrumentation, we inevitably cite testing. Therefore, our tests must be valid and reliable.

First, a valid test is the one which measures what we intend it to measure. But devising a valid test is a matter of ‘expert judgment’; thus, it may be ‘subjective’ and ‘unreliable’ (Corder, 1973, p.357).

Second, in order to devise a reliable test, Robson (1973, pp. 117–118) suggested the use of a series of observations as a basis for the measure such as using the mean.

**Mortality.** It is concerned with the subjects who drop themselves out of the study for any reason, such as transfer to another institution or serious illness (Brown, 2004).

Subjects’ biases include the Hawthorne effect, the Halo effect and subject expectancy.

**The Hawthorne effect.** It is related to the fact that subjects change their behavior once they know that they are in an experimental setting. Therefore, the Hawthorne effect may cause the Halo effect.

**The Halo effect.** It happens “if subjects know they have been selected to try something new, this knowledge may motivate them to greater effort and; thus, increase their performances” (Tumey & Robb, 1971, p.121).

**Subject expectancy.** It is an effect related to subjects; it “occurs when the subjects think they have figured out what a study is about and try to ‘help’ the researcher to achieve the apparent aims” (Brown, 2004, p.34). As subjects may have expectancies about the experiment, so may the experimenter. When the investigator knows the control and the experimental groups, s/he may influence the latter group in a subtle and uncontrolled way to obtain superior scores. This effect can be neutralized in medical research by using the “*double-blind*” technique, when some subjects receive a drug and the others receive a “*placebo*”, i.e., a sugar pill, this is called the “**placebo effect.**” Neither the subjects nor the researcher would know which group is which. In such a way, both experimenter and subjects’ expectancies may be controlled. This cannot be done in language teaching and learning because of the complexity of treatments in such a setting.

Hence, it is evident that despite careful planning, all difficulties related to controls cannot be anticipated: subjects may not be affected by the way the researcher expects them: questionnaires may not elicit the kind of data anticipated; and instructions are sometimes unclear. Such experiences constitute a good evidence of the need for further research

### **Experimental Group**

An experiment is conducted on a sample or a group of subjects. The group, which is assigned to the experimental variable or treatment is known as an experimental group.

## **Controlled Group**

The effectiveness of experimental variable is examined by comparing with controlled variable. The group, which is allotted to controlled variable is termed as controlled group

### **Experimental Control**

The main important problem of an experiment is the experimental control. For an accurate conclusion, it is essential that all variables except experimental variable, should be controlled. It should only be in a functional situation. According to McGuigan: The word 'Control' implies that the experimenter has a certain power over the conditions of this experiment. He is able to manipulate variables in an effort to arrive at a sound conclusion.

### **Needs of Control**

1. For the internal validity of result.
2. To know the effect on situations by changing them.
3. To make scientific observation.
4. To make a prediction.

The control means to hold over the situations in this way that a change at any time can be brought about and could control the effect.

### **Steps of Experimental Method**

The steps of the experimental method are essentially those of the scientific method. For the sake of clarification, they may be listed as follows:

#### **Selecting and Delimiting the Problem**

The problems amenable to experimentation generally can, and should, be converted into a hypothesis that can be verified or refuted by the experimental data. The variables to be investigated should be defined in operational terms, for example, the scores on a test of acceptable validity.

#### **Reviewing the Literature. (see details next)**

#### **Preparing the Experimental Design**

While it should also include a clarification of such basic aspects of the design as the place and the duration of the experiment, this section should place primary emphasis on the questions of control, randomization, and replication. Because of the complexity of an experiment, it is generally advisable to conduct a pilot study in order to ensure the adequacy of the design.

#### **Defining the Population**

It is necessary to define the population precisely so that there can be no question about the population to which the conclusions are to apply.

#### **Carrying Out the Experiment**

It is necessary here to insist on close adherence to plans, especially as they relate to the factors of control, randomization and replication. The duration of the experiment should be such



that the variable under investigation is given sufficient time to promote changes that can be measured and to nullify the influence of such extraneous factors as a novelty.

### **Measuring the Outcomes**

Careful consideration must be given to the selection of the criterion on the basis of which the results are to be measured, for the fate of the experiment depends in no small measure on the fairness of the criterion used.

### **Analyzing and Interpreting the Outcomes**

The investigator is concerned with the operation of the factor under study. He must be especially sensitive to the possibility that the results of his study arose through the operation of uncontrolled extraneous factors. He must further exclude, at a given probability level, the possibility that his experimental findings are simply the results of chance. In no other area of educational research is the need for competence in statistical procedures so clearly indicated as in the analysis of experimental data as the basis of their valid interpretation. Of course, statistics cannot correct fulfill in the design or overcome inadequacies in the basic data. The investigator must recognize that statistical tools do not relieve the scientist of his responsibility for planning the study for controlling extraneous factors and for obtaining valid and precise measurements. It can also be argued that there is limited justification for high-powered statistical refinement in the early exploration of a problem area or in instances where the data involved are essentially crude and imprecise.

### **Drawing Up the Conclusions**

The conclusions of the study must be restricted to the population actually investigated and care must be taken not to over generalize the results. The results also pertain only to the conditions under which they were derived and since control may have distorted the natural situation care must be taken to restrict the conclusions to the conditions actually present in the experiment. The investigator must not forget that his conclusions are based on the concept of probability, but especially he must not fail to recognize the limitations underlying his conclusions and/or the special conditions that restrict their applicability.

### **Reporting the Result**

The study must be reported in sufficient detail so that the reader can make a judgement as to its adequacy.

### **Various Types of Errors**

Generally, in an experimental study, errors may be of two kinds:

(1) Chance error and (2) Systematic error.

### **Chance Error**

This error is due to the individual differences, e.g., if we are studying the superiority of programmed method over traditional methods, then the differences in intelligence, learning ability, socio-economic status, established habit of study, etc. may affect our study. In chance error *two categories* may be according to the sources of errors.

**Sampling Error.** The error is due to the differences within the sample chosen for study is known as sampling error, e.g., in the above study habit of study, intelligence etc.

**Measurement Error.** It is due to inability of measuring instruments to produce accurate results.

### **Systematic Error**

In spite of precautions taken, other factors than those involved in the study, may affect our experiment during study. It causes results to vary in a particular direction. Systematic error causes bias in study and it is far more likely to catch the researcher by surprise than does chance error, e.g., in the above study the differences in circumstances attending the administration of methods, poor or well ventilation of classroom, teacher's performance etc. A rather famous source of systematic error in research studies is the "Hawthorne effect".

Whenever a new method or treatment is studied the persons, using it, try to prove it better, no matter which is actually superior. Generally the researcher wants to prove his hypothesis this way or that way. This kind of effect cannot be controlled completely. Every researcher tries to control these errors through experimental designs.

### **Limitations**

The equated groups procedure has the following limitations:

- a. This method suffers from the difficulty of equating groups and controlling significant variables.
- b. These are several administrative problems for selecting subjects from schools.
- c. The sampling error cannot be minimized by this procedure. (Sengh, 2006, pp.135–172)

## Research Proposal

Research proposals and research reports are similar in many respects, the main difference being that a **research proposal** is generated *before* a study begins, while a **research report** is prepared *after* a study is completed.

A research proposal is nothing more than a written plan for conducting a research study. It is a generally accepted and commonly required prerequisite for carrying out a research investigation. It communicates a researcher's intentions, makes clear the purpose of the intended study and its justification, and provides a step-by-step plan for conducting the study. The research proposal identifies problems, states questions or hypotheses, identifies variables, and defines terms. The subjects to be included in the sample, the instrument(s) to be used, the research design chosen, the procedures to be followed, how the data will be analyzed—all are spelled out in some detail, and at least a partial review of previous related research is included.

A research proposal, then, is a written plan of a study. It spells out in detail what the researcher intends to do. It permits others to learn about the intended research and to offer suggestions for improving the study. It helps the researcher clarify what needs to be done and helps him or her avoid unintentional pitfalls or unknown problems. Such a written plan is highly desirable, since it allows interested others to evaluate the worth of a proposed study and to make suggestions for improvement.

### The Major Components that Make Up the Research Proposal

1. Background of the Study
2. Statement of the Problem
3. Aims of the Study
4. Research Questions
5. Hypothesis
6. Method (see previous lectures above)

These elements will be explained in master levels.

This section is done as a revision lecture, in which the students are asked to prepare a research proposal (RP) (as a QUIZ of S1). Also, they received practical explanations about the elements of (RP).

The topic investigated is about "Effective Supervision", it is done under the guidance of the teacher via workshops (four students each). The following are the main elements of a proposal briefly explained.

#### **Background**

It is important because it shows what previous researchers have discovered. It is usually quite long and primarily depends upon how much research has previously been done in the area you

are planning to investigate. If you are planning to explore a relatively new area, the literature review should cite similar areas of study or studies that lead up to the current research. Never say that your area is so new that no research exists. It is one of the key elements that proposal readers look at when deciding whether or not to approve a proposal.

### **Statement of the Problem**

The statement of the problem is the focal point of the research. It is just one sentence (with several paragraphs of elaboration). In this section, the researcher looks for something wrong or something that needs close attention...or existing methods that no longer seem to be working. After selecting a problem, it should be stated carefully, Kerling (cited in Singh, 2006) has identified three criteria of a good problem statement. These mainly concern:

1. A problem should be concerned with relation between two or more variables.
2. It should be stated 'clearly and unambiguously in the right form.
3. It should be amenable to testing (p.29).

While the problem statement itself is just one sentence, it is always accompanied by several paragraphs that elaborate on the problem.

1. Present persuasive arguments why the problem is important enough to study.
2. Include the opinions of others (politicians, futurists, other professionals).
3. Explain how the problem relates to business, social or political trends by presenting data that demonstrates the scope and depth of the problem.
4. Try to give dramatic and concrete illustrations of the problem.
5. After writing this section, identify the single sentence that is the problem statement.

### **Aims of the Study**

This section should:

1. state unambiguously and concisely the purpose of the research (and situating it in the broader context), and
2. outline the aims and key research questions (make sure that you relate the aims to the purpose above and to the research questions which follow on from this).

### **Research Questions**

It may be useful to present the research as a series of research questions to be examined by the thesis. An effective structure might be to use each question as a sub-heading to a paragraph or two of elaboration and detail on the "problem" or "issue" contained in each research question. Research questions ask what relationships exist between the different variables in the study.

## **Research Hypothesis(es)**

Research hypotheses are assumptions about the tentative solution of the research. These assumptions are derived on personal experience, review of the related literature, consultations/ focused interviews with the experts / professionals or combination of all.

## **Choice of the Method**

The methodology section describes the basic research plan. It usually begins with a few short introductory paragraphs that restate purpose and research questions.

## **Population Sample and Sampling**

The basic research paradigm is:

1. Define the population
2. Draw a representative sample from the population
3. Do the research on the sample
4. Infer your results from the sample back to the population

## **Significance of the Study**

This section creates a perspective for looking at the problem. It points out how your study relates to the larger issues and uses a persuasive rationale to justify the reason for your study. It makes the purpose worth pursuing. The significance of the study answers the questions: Why is your study important? To whom is it important? What benefit(s) will occur if your study is done?

## **Scope and Limitations**

All research studies also have limitations and a finite scope. Limitations are often imposed by time and budget constraints. Precisely list the limitations of the study. Describe the extent to which you believe the limitations degrade the quality of the research.

**Literature Review** (see next section).

## **Definition of Terms**

This section should provide a list of specialized terms, words, or concepts, and their meanings (e.g. Foreign borrowings, acronyms, specialized concepts, etc.).

## **References/Works Cited**

This section should provide a list of the sources or academic works that have been found and consulted up to the present. The researcher can use different styles (APA/ MLA, etc.) referencing conventions with what is recommended by supervisor(s).

## **Appendices**

This section should provide relevant documents which are best not seen in the main text (body of the thesis, dissertation, memoir, article, etc.) (because they affect readability). These may be source documents, pilot study data, interview questions, surveys, questionnaires instruments, etc.