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Lesson No.

- 1.1 : Social Research
- 1.2 : Scientific Method : Meaning and Characteristics
- 1.3 : Hypothesis
- 1.4 : Techniques of Data Collection : Observation
- 1.5 : Interview and Interview Schedule
- 1.6 : Questionnaire

Department website : www.pbidde.org

SOCIAL RESEARCH: MEANING, OBJECTIVES AND STEPS IN SOCIAL RESEARCH**STRUCTURE**

- 1.0 Objectives
- 1.1 Introduction about Research
- 1.2 Meaning and Definition of Social Research
- 1.3 Objectives of Social Research
- 1.4 Steps in Social Research
- 1.5 Summary
- 1.6 Key Concepts/Words
- 1.7 Exercise Questions
- 1.8 Short Questions
- 1.9 Reading List

1.0 Objectives

By the end of this chapter, the student shall be able to:

- To understand the meaning of research and social research.
- To explore the different objectives of social research.
- To know the different steps in social research.

1.1 Introduction about Research

Research means discovery of some hidden facts or laws. Research and its techniques are helpful in finding further knowledge about the subject. Through research only it has been possible to make progress. It is a part of man's nature. The important saying goes, 'necessity is the mother of invention' and invention is the result of research. So long as necessity exists, the research shall be there. As is put by P.V. Young, "Curiosity is an intrinsic trait of human mind and a compelling drive in the exploration of man's surroundings." It is a natural instinct in man to

know about the unknown world surrounding him. Due to his efforts to explore the physical world, he develops various physical sciences. Similarly, he daily observes various social activities of man which are very complex, varied and abstract in nature. He employs different methods to analyse the nature of social phenomena. Social research is the name of the exercise undertaken to analyse the nature of social phenomena. In the past, man had applied many traditional methods to unveil the secrets of the social world. But in modern times, the application of the scientific method has become imperative for investigating social phenomena.

Research aims at discovering the truth. Research is undertaken to discover answer to questions by applying scientific methods. Research may be defined as a careful critical inquiry or examination in seeking facts or principles with the discovery of new facts, old conclusions or theories may be either rejected or modified. Research is necessary to examine the extent of validity of the old conclusions or to find out some new facts and generalizations in connection with the existing one. Thus its purpose is to give new directions and new insight to the existing problems.

The word 'Re-search' is a combination of two English words 'Re' which means repeated and 'search' which means discover. So research means to verify the old facts and at the same time to discover new facts. So, in simpler words, research means to find out those unknown facts working behind social phenomena which lead to the discovery of many uniform laws underlying human behaviour.

1.2 Meaning and Definition of Social Research

A social research encompasses scientific investigations conducted in the field of social sciences and also in behavioural sciences. Social research is a very broad category within which there are many sub classes. Social research involves application of scientific methods for the understanding, studying and analyzing of social life in order to modify or act or verify the existing knowledge as a system.

Some of the definitions of the social research are as follows:

According to **P.V. Young**, "We may define social research as the systematic method of discovering new facts or verifying old facts, their sequences, inter-relationships, casual explanation and natural laws which govern them."

According to **E.S. Bogardus**, "Social Research is the investigation of the underlying processes operative in the lives of persons who are in association."

According to **Moser**, "Social Research means systematised investigation to gain new knowledge about social phenomena and social problems."

According to **W.S. Monero**, "Research may be defined as a method of studying problems whose solutions are to be deprived partly or wholly from facts."

According to **Whitney**, "Social research includes a study of human group relationships."

Apart from these definitions, Marry, Stephenson, Red Mann and others have also defined social research as an effort to acquire new knowledge. In fact, research is an organised effort to acquire new knowledge. It is based on the past experience and past knowledge. Since sociology is assuming a scientific base, research has become a part of study, but it is not an easy task to predict social behaviour because the human nature is ever changing.

On the basis of these definitions, it becomes quite apparent that the main purpose of research is to discover new facts and verify the validity of the old facts. In the context of the new emerging social situation, it becomes imperative to test the validity of the old theories. In brief, for discovering those uniform laws which are governing and organizing human relations, social research has become imperative. Social research is connected with the social life. The two cannot be separated. Social research is in fact a part of the scientific study or scientific approach. The social research investigates and verifies facts about social life and formulates laws in this regard. After the laws have been formulated, investigation is carried out and inter-relationship between various facts and laws is established. Through these steps we are able to collect data and knowledge about society. It has no direct relationship with the solution of the social problem. It provides scientific knowledge about these problems and helps the researcher to find out solution. In brief the primary goal of research is to explore and gain an understanding of human behaviour.

1.3 Objectives of Social Research

The main aim of social research is the comprehensive analysis of the social reality to discover new laws and to find out the causes of different social problems emerging in social life from time to time. It is a scientific approach of adding to the knowledge about society and social phenomena. It is guided by certain objectives enumerated as below. Some sociologists have given two main objectives of social research:

(a) Theoretical

(b) Applied

(a) Theoretical objectives of social research:

1. **Development of Knowledge:** Man is always curious to explore his surroundings. This curiosity leads him to acquire true knowledge, to understand the various laws that govern his social life. Social research is an organised and scientific effort to acquire further knowledge about the social phenomena and social facts. Social research is not an object itself. Thus the primary object of social research is to get true and intimate knowledge of human society and its functioning, to know and understand the laws that are operating behind various social activities of man. Therefore, the academic purpose of social research is the acquisition of knowledge and the thirst for knowledge have been responsible for vast variety of research work even when no material incentive was present.
2. **Verification of old facts:** In society, new conditions are always emerging which necessitate the verification of old facts and the discovery of new ones.
3. **Formation of different concepts:** On the basis of scientific research, different concepts are formed and meaningfully defined. Concepts like culture, cultural diffusion, cultural conflict, acculturation etc. have been developed on the basis of facts formed by social research.
4. **Scientific study of social life:** Social research is an attempt to acquire scientific knowledge about the social phenomena. The researcher makes study of the collective processes, social change, social structure, social processes etc. Apart from it, he makes study of human being and collects data about various

aspects of social life and formulates laws in this regard. Once laws have been formulated, he tries to establish the inter-relationship between these facts. All these steps are intended at adding to the knowledge about social phenomena.

5. **Classification of facts:** Every scientist has certain aims before him. These aims are guided by personal ambitions and use of the scientist. But in no case he can keep himself away from the object of clarification of facts. This is what P.V. Young has observed: "Social research aims to clarify facts in a given universe of discourse to find the specific determined sequences and inter-relationships of facts and their social settings to develop a series of clear cut concepts and to examine the old concepts which are to define social life."
- (b) **Applied objectives of social research:** Another objective of social research is to understand human behaviour so that different measures can be adopted to organize and control various aspects of it. As is put by P.V. Young, "The primary goal of research –immediate or distant-is to understand social life and thereby gain a greater measure of control over social behaviour." Social research is based on the empirical study of fundamental human traits and tries to find out the basic causes of different problems which human society is facing. The following may be described as the applied objectives of social research:
 1. **To find the causes of social problems:** An applied objective of social research is to find out the root causes of different problems which a society is facing. For example it has been found that in spite of police, jails and other agencies of social control, the rate of crime has increased. In order to find out a permanent solution of such problems, detailed study of human behaviour is imperative. More and more social research is being directed to this purpose of finding the causes of social problems. All this requires a perfect understanding of human society and its various activities.
 2. **To remove tensions:** Another objective of applied research is to eradicate different kinds of tensions from the society. By analyzing the causes of different problems, we can resolve them. Therefore, the purpose of the social research is to find a remedy for all social evils prevailing in the society.

3. **Helpful in social planning:** Applied research supplies knowledge of the reality on which social planning can be based. It should be made clear here that applied research is not directly concerned with social planning but its aim is to analyse the reality on which successful social planning may be based.
4. **To bring out various alternatives:** Social research tries to bring out various alternatives for problem solving or conflict resolution. Thereafter, the best possible alternative is selected.
5. **Sources of social change and social control:** Social research helps to acquire more and more knowledge. By widening the horizon of knowledge, a better understanding of human society is possible. This may be applied to give a desired direction to social change and to control social phenomena.
6. **Welfare of humanity:** The knowledge that we acquire is intended at bringing about welfare of the humanity. No scientist or researcher makes study only for the sake of study. He has to direct his study to some higher aim which invariably is 'Welfare of Humanity'. According to Kaufmann, "To promote the welfare of humanity by the results of investigation may be the ultimate aim of one scientist. Another may set as his goal the achievement of material security and social prestige for himself: A third may find scientific enquiry 'an end itself' in the sense that satisfaction he derives from his scientific work is a reason enough for his engaging in it. In these cases scientific activity appears as a means to the attainment of ends that are not defined exclusively in terms of the scientific process."
7. **Social control and prediction:** Through social research we can make study of the social phenomena, events, and the factors that govern and guide them. Apart from that we present an analysis of the social life and the laws governing them in the scientific manner. Through study, new laws that are result of the scientific study are formed. Apart from all these, under social research we study social relations and their dynamics. This study is helpful in social control and prediction of social behaviour. Paul Lazarsfeld and Morris Rosenberg have pointed out, "The ultimate object of many research undertakings is to make it

possible, to predict the behaviour of particular type of individuals under specified conditions.”

Goode and Hatt has given the following objectives of social research:

1. The main objective is to find out new facts on the basis of which new theories are formulated and the old theories are verified.
2. With the widening of the horizon of knowledge, it becomes imperative that the meaning of different concepts must be made clear with reference to the new emerging situations in which they are used.
3. By applied research, correlation among different theories is established. For example, with the help of research, it has been established that in cities, crime rate is higher as compared to the villages. Then different factors such as economic, psychological or various characteristics of the urban society may be considered to be the casual factors of the rising rate of crime.
4. Applied research seeks to examine the validity of the existing theory. When new theories emerge, it becomes essential to verify old theories. Those theories are discarded which can not be validated or according to the situation, some amendments may be done as is suggested by social research.

1.4 Steps in Social Research

According to *Auguste Comte*, who is considered the 'Father' of sociology, like physical phenomena, no social event happens accidentally. There are definite laws which govern its operation. So, to study such phenomena, a systematic approach has to be applied. Similar ideas are advocated by *Karl Pearson*. In his words, "There is no shortcut to truth, no way to gain knowledge of the universe except through the gateway of scientific method."

Prof. Young has given the following steps of the scientific method:

- (a) Formation of hypothesis.
- (b) Observation and collection of facts.
- (c) Classification and tabulation of facts.
- (d) Generalisation.
- (e) Formation of theory.

Not only in the social research, but in the other branches of research, whether they be connected with natural-sciences or social sciences, certain steps have to be taken on scientific lines. These steps consist of a number of closely related activities. So independent are these activities that the first step of a research largely determines the nature of the last. If systematic steps have not been taken into account, serious difficulties may arise. They can be avoided only when each step has been adopted in the research process. Although, according to the nature of the problem, the scientific procedure to be adopted may differ, but, generally, the scientific method of study consists of the following steps. These steps are:

1. **Selection of the problem-** Before we proceed to find out difference in anything new, we first of all select a problem. we go to study things in regard to that problem and add knowledge. The problem selected has to be relevant to the study that we make. In brief, the investigator needs to formulate a specific problem which can be investigated by scientific procedures. The success of a study depends on the thoughtful selection of a problem. The problem should be realistic and of contemporary nature; only then its scientific analysis is possible. Any problem which exists, in the imagination of the scientist cannot be analysed scientifically. After the selection of the problem, a specific title may be given to set the limits of the study. In case, no title is given, the study will be so vague that practically, it becomes difficult to study it. While selecting the problem, the following points have to be taken into consideration:

- (a) Is any work already done on the problem under study? If yes, then before starting the study, its complete knowledge must be acquired.
- (b) What are the objectives of the research? They can be many or for a single objective, research can be conducted.
- (c) Is it possible to conduct experimentation on the problem under study?
- (d) What will be the expected trend of public opinion about the research problem? Will public opinion be positive or negative?

In brief, after taking into account the above stated points, the research problem should be selected.

2. **Formulation of the Research Problem.** *R.L. Ackafr* in his book 'The Design of Social Research' has considered the following steps imperative for the formation of a research problem:

I. Purpose of Research. There are three main objectives of research: (a) Pure research, (b) Applied research, (c) Action research. After fixing the purpose of research, it becomes easier to conduct the research, because the goal is set.

II. Units of Research. All those units, which can be a group or an individual, who are directly or indirectly associated with the research must be clearly marked.

III. Alternative Means. Every research problem has many alternatives. The researcher must specify those alternatives which are directly concerned with the objectives of the research.

IV. Conditions to which the Problem is Related. While framing a research problem, one must take into consideration the relevant social and geographical environment because a change in these conditions is going to affect the form and nature of the problem.

V. Description of the concepts and Variables. All Those concepts and variables which he is going to use must be well defined. A detailed description of them must be given at this stage.

3. **Study of research literature-** Mere selection of the problem would not lead us to any place. What is needed is the collection of data. For proper understanding of the problem we have to survey the informations and the literature in regard to that problem. Through this survey, we are able to collect information about the problem.
4. **Definition of the problem-** Once we have collected informations about the problem and surveyed it, we are in a position to tell others what the problem actually is. This is the step which is known as the definition of the problem.

5. **Analysis and classification of elements of the problem-** Once the problem has been defined, we know the elements that form it. If we are able to know about various elements of the problem, we shall be able to know about it in detail. This detailed knowledge helps us to proceed further and carry on research.

6. **Promulgation of research design-** For scientific research it is necessary to prepare a promulgated research design. Once the design has been prepared in advance, we shall be able to carry on the work systematically and easily. There are certain drawbacks in the preparation of the research design but once design has been prepared, it is easy to test the hypothesis, analyse data and take others steps.

7. **Selection of the Research Area.** The third step of scientific method is the selection of the area where research is to be conducted. The following points must be taken into consideration while selecting the research area:

- (a) Distance.
- (b) Mode of conveyance.
- (c) Size of population.
- (d) Geographical conditions.
- (e) Availability of the relevant units.

The research area may be selected on the following basis:

I. **Geographical basis.** It can be a city, village, a country or any other locality. For comparative analysis, tow units are selected.

II. **Administrative basis.** It can be any administrative unit. A municipality area, a village, a block, a district etc.

III. **Historical basis.** If research is concerned with the study of different ages, the relevant units present in different historical times are taken into consideration.

IV. **Socio-cultural basis.** According to the nature of the research problem, a specific unit of socio-cultural nature is selected for study. It can be a family, caste, religion, race or any other unit of socio-cultural nature.

V. Economic basis. If the problem is associated with economic life, then on economic basis, units are defined, for example-Rich, Middle and Poor class.

8. Universe and the Sampling Unit. After fixing up the basis of research, a scientist must define the relevant area from where he is going to select his sample. For example, if he wants to study the family system of a village, then, all the families present in the village are his universe is that whole from where the sample for conducting research is to be taken. in this case, the family is his sampling unit. After fixing up the sampling unit, the sample is selected and proper care is taken that it must represent the whole.

9. Formulation of Hypothesis: Before conducting research, a scientist must have some idea about the path which he is to take and the goal which he is to achieve. To achieve this goal, he must form a hypothesis. It is based on estimation or imagination and if we fail to achieve the set goal, then we may change our hypothesis. Our research is to be based on hypothesis. It is an idea about the direction in which a scientist is to proceed, however, vague it may be. Research cannot be conducted without a hypothesis. A hypothesis is a theory, the validity of which is yet to be tested. If is verified, then the hypothesis is established as a theory. So, a hypothesis is a mental construct which is yet to be verified. Some of its definitions are as follows:

I. *Lundberg*, " A hypothesis is tentative generalization, the validity of which remains to be tested. In its most elementary stage, the hypothesis may be any hunch, guess, imaginative idea, which becomes the basis for action or investigation."

II *Goode and Hatt*, "It is a proposition which can be put to test to determine validity."

III According to Webster, "A hypothesis is a proposition, condition or principle which is assumed, perhaps without belief in order to draw out its logical consequences and by this method to test its accord with facts which are known or may be determined."

From the above definitions, it becomes clear that a hypothesis is different from a theory. *William H. George* has made it clear when he states that, "Hypothesis is an elaborate theory,"

Sources of Hypothesis. Goode and Hatt have given the following sources of hypothesis:

- I. **Culture.** The nature of local culture generally forms an important basis of hypothesis. For example, spiritualism is the fundamental basis of Hindu culture.
- II. **Scientific Theories.** Scientific theories give rise to many hypotheses. On the knowledge of theories, generalizations are made which become the basis of hypothesis.
- III. **Analogy.** When similarities between two units are discerned, then it may become the basis of hypothesis. For example, on the basis of the theory of organic evolution, it has been imagined that like an organism, society also evolves and this hypothesis gives rise to the theory of social evolution.
- IV. **Personal Experiences.** According to Goode and Hatt, many a time, personal experiences become the basis of a hypothesis. For example, all of us have seen the falling of an apple but it strikes to Issac Newton only that it may be due to the force of gravitation.

Characteristics of a Hypothesis: The following are the main characteristics of a workable hypothesis:

- (i) **Clear and specific.** A hypothesis must not be vague. Every aspect of it must be clearly defined. For example, humanity is a very wide and vague term and which aspect of it is to be studied must be made clear in the hypothesis. As is put by *P.V. Young*, "The use of hypothesis prevents blind search and indiscriminate gathering of masses of data which may later prove irrelevant to the problem under study."
- (ii) **Simple language and conceptual Clarity.** A hypothesis should be expressed in simple language so that, its meaning must be made

specifically clear. Actually, a hypothesis is a mental product and when the scientist puts it in words, he may not be able to explain it correctly. For this purpose, two things are to be taken into consideration. Firstly, words used must be in the same sense as commonly used by the people. Secondly, if any new concept or term is used, its meaning must be made clear.

- (iii) **Applicability of the modern technique of social research to study the hypothesis.** A hypothesis must be of such a nature as can be studied by applying any of the available techniques. If no method is applicable, then the study of such a hypothesis becomes impossible. But there are many such instances when society faces a serious problem and techniques to study it are discovered later on. The Marxian theory of dialectical materialism and Durkheim's theory of suicide are such examples. But it does not mean that a hypothesis can be purely imaginative, the study of which may become impossible. On the contrary, a hypothesis has to be based on reality which can be subjected to scientific enquiry.

From the above description, it becomes clear that a hypothesis should be based on reality which can be studied by contemporary scientific techniques.

Forms of Hypotheses

- (i) **Hypotheses studying the existence of empirical uniformity.** This type of hypotheses are formed to study the general trends present in human behaviour. They tend to study the common ways of behaviour.
- (ii) **Hypotheses that study the existence of logical relationship.** In this form of hypotheses, logical relationships between empirical uniformities are established.
- (iii) **Hypotheses which are concerned with the relationship of different variables.** These hypotheses are formulated to study the cause-effect relationship among different factors. For example- there

are many causes of poverty and this type of hypotheses tends to analyse them and correlate them.

Importance of a hypothesis: A hypothesis is the basis of scientific research after verifying the validity of which, scientific theory is made. It gives specific direction to scientific enquiry and leads it to a definite goal. In the absence of any hypothesis, we are sure to be caught in the wilderness and shall never achieve our goal. Its main points of importance are as follows:

- (i) **It provides proper direction to scientific enquiry.** It makes the enquiry more specific and clear. The goal is set and it provides those lines of action which are to be followed. Without a hypothesis, a scientist will be like a sailor who is sailing in a rudderless boat and he may be caught in the wilderness. So, a hypothesis gives the point of enquiry and defines that specific path which is to be adopted to reach a specific destination.
- (ii) **It defines the point of enquiry.** A hypothesis makes the work of the scientist very easy. It defines the goal and gives guidance in which direction a scientist is to proceed to reach his pre-set goal. He may have to follow one method and abandon the other to reach his destination but ultimately, he will be able to reach his destination.

(iii) **It limits the area of research.** A hypothesis defines the area of research and makes scientific enquiry practically possible. Otherwise, social facts are scattered so widely that a scientist may spend the whole of his life in exploring them. By defining the area of enquiry, a hypothesis make scientific enquiry viable.

(iv) **Selection of relevant and pertinent facts.** Without, hypothesis, when the scientific enquiry has no set goal, a scientist may fail to decide which facts are to be collected and which are to be abandoned. He may end up in collecting heaps of facts the classification and tabulation of which may become difficult. These facts can be of such a varied nature that generalisation becomes impossible. By the formulation of a hypothesis, all these problems are overruled. A scientist knows the relevant facts which are pertinent to his study. **P.V. Young** has rightly stated in this direction, "The use of hypothesis prevents blind research and indiscriminate

gathering of masses of data which may later prove irrelevant to the problem under study."

(v) Hypothesis is the basis of scientific theory. According to *Goode and Hatt*, "Without hypothesis, the research is unfocussed, a random empirical wandering. The results cannot be stated as facts with clear meaning. Hypothesis is a necessary link between theory and investigations, which led to discovery, and addition to knowledge." Hypothesis helps to collect relevant facts which are the basis of scientific theory. So, hypothesis is the fundamental basis of scientific enquiry which helps in formation of a theory.

Demerits of hypothesis: Hypothesis has following demerits:

- (i) Many a time, a scientist has so much faith in the validity of his hypothesis that in place of verifying it, he starts twisting the facts according to it, thus mistaking it for a theory.
- (ii) The scientist observes the facts from his own individual point of view. There is every possibility that he may explain them from that point of view which support his hypothesis and he may discard the points of dispute. This may lead to subjective interpretation of the facts.

To overcome these drawbacks, a scientist must observe the facts impartially and always keep this point in view that the main aim of research is not to establish the validity of his hypothesis but to verify the validity of it.

10. Observation and collection of data. After the formation of hypothesis, the next step of scientific enquiry is the collection of data. In social research, different methods such as observation, questionnaire, interview survey method or case study method may be employed to collect the facts. The nature of the problem decides which method of enquiry is to be employed. For instance, if the emotions of the units are to be studied, then the interview method may be applied and in case the units are scattered over a wider area, then the questionnaire is the best method of study. Different ways of life may be studied by observation. In brief, a scientist must select that method of enquiry which helps him to collect valid relevant facts.

11. Classification and Tabulation of data. After the collection of data, these are to be classified into different categories according to the nature of the units: The whole

data are divided into different categories on the basis of the differences present in different units. Thus classification means arranging the data in different classes or groups according to their similarities or dissimilarities. In the mass of data, by classification, an order is created. After classification, the data are placed in the form of tables in order to facilitate generalization. Tables make the data more precise and organised and it becomes easier to make a comparative study.

12. Analysis and interpretation of data- Once data have been systematised, classified and tabulated, we proceed to analyse and interpret it. On the basis of the collection and systematisation, we are able to know which data belongs to which field and what are the basic requirements of a particular data and what are its characteristics. These things can be found out through analysis and interpretation.

13. Verification of the problem and hypothesis- Once, the analysis and interpretation of data have taken place, we formulate certain hypothesis. The hypothesis has to be put to test so that we may know the results that are put forward, which are correct. Without verification of the hypothesis, it is not possible to arrive at any correct result. Once the hypothesis has withstood the test of verification, certain generalisations can be drawn.

14. Generalisation. After the data have been collected and placed in tables, then generalizations are made to draw the inferences. Broad conclusions are drawn on the basis of the generalizations. Once hypothesis has been proved to be correct as a result of verification, certain general principles can be laid down and prepared. These general principles are based on the results of the analysis and verification of the data scientifically tabulated, systematised and classified. These generalisations are the principles which prove that under certain circumstances certain results takes place.

Two method are employed for generalization:

(1) Logical method and (2) Statistical method.

(a) Logical method. Johan Stuart Mill has given the logical method for generalisation as given ahead:

(i) Method of Agreement. This method can be applied in positive as well as in negative cases. Symbolically, it may be given as follows

In a positive case:

A + B + C	produce x
C + D + E	produce x

Since C is the common element in both the categories, it can be accepted that C is the cause of x.

In a negative case:

	A + B + C	produce x
non	C + D + E	produce non x.

We can draw the conclusion that C is the cause of x. As in the negative case, the absence of C causes absence of x.

(ii) Method of Difference. In this method, both positive and negative methods of agreement are jointly used. It can be given as follows:

A + B + C	produce x
A + B + non C	produce non x

Therefore C is the cause of x.

To take an example, suppose the rate of employment and growth of industries are directly related. With the increase in the growth of industries, the rate of employment increases in the society. In the absence of industries, the rate of employment decreases. So, it can be concluded that industrialisation is the cause of the growth of employment in the society.

(iii) Joint Method. This method is a combination of the methods of agreement and difference. Symbolically, it may be explained as follows:

Method of agreement:

A + B + C	produce x
C + D + E	produce X

Since 'C' is common in both the categories, it can be the cause of x.

Method of difference:

A + B + non C	produce non x
non C + D + E	produce non x.

Since C is absent in both the categories, C is the cause of X.

(iv) Method of Residues. This method was first of all used by Sir John Herschel. According to this method, if on the basis of previous knowledge, it is known that a part of the phenomena under specific circumstances is causally connected, then the rest of the phenomena is also thought to have cause-effect relationship. This method was used by many scientists. For example, Pasteur used this method to test the effect of vaccination in preventing small pox. He vaccinated 25 sheep and found that those sheep which were vaccinated survived while the other perished thus proving the preventive value of vaccine against the disease of small pox.

(b) Statistical Method. For the application of this method, information collected must be of quantitative nature on the basis of which averages, mode, mean and median etc. may be calculated.

15. Inductive and Deductive Method (Formation of Theory). After the collection of data, generalisation is made by two methods-inductive and deductive and a theory is established. By the method of induction, generalisation is made on the basis of information collected from individual units. By this method laws are made on the basis of particular cases and thus applying them to the whole. For instance, we observe that Ram dies and Sham also dies and from these specific cases, a scientist can draw the conclusion that everybody dies or man is mortal.

In the deductive method, general information is verified by applying it to specific cases. For example, when a scientist gets the idea that everyone is to die. In order to verify it, he studies specific cases and establishes a universal theory that every living being is to die.

The method of deduction and induction are interdependent. A hypothesis is formulated on the basis of the method of induction. And then, with the application of deduction, after verifying the information collected by the inductive method, a universal theory is formed.

16. Preparation of the Report. The last step of the scientific method is the preparation of report. The following points are to be taken into account while preparing the final report:

- (a) The report should be written in simple words. Different concepts or words must be used in the same sense as they are used in common practice.
- (b) Facts should be represented logically and in a proper sequence. They should not be based on the imagination of the scientist.
- (c) Facts of similar nature must not be repeated.
- (d) Headings, tables and other pictures must be exhibited properly and at proper places.
- (e) The source of the information must be given, so that, if any researcher wants, he can check the validity of the given facts.
- (f) If the scientist wants to give some suggestions, then they must pertain to the subject under study and must be of practical nature.
- (g) Difficulties faced during research must be mentioned in detail.
- (h) In the report, such suggestions can be given as can be helpful for the scientists in conducting research in future.

The following points may be given while writing the final report:

- (a) Introduction,
- (b) Description of the nature of the problem,
- (c) Aims and objectives of the research,
- (d) Research methods applied for conducting the research,
- (e) Analysis of facts,
- (f) Conclusion,
- (g) Suggestion pertaining to the research.

17. Preparation of bibliography- In the research, use of library and survey of literature is an important step. For correct study and survey, it is necessary to prepare a list of the books consulted or that may be consulted. Bibliography will help us to acquire correct knowledge of the problem.

CHECK YOUR KNOWLEDGE

1. Describe briefly the objectives of social research?

2. Elaborate different steps in social research?

1.5 Summary

Research means discovery of some hidden facts or laws. Research aims at discovering the truth. Research is undertaken to discover answer to questions by applying scientific methods. Research may be defined as a careful critical inquiry or examination in seeking facts or principles with the discovery of new facts, old conclusions or theories may be either rejected or modified. Research is necessary to examine the extent of validity of the old conclusions or to find out some new facts and generalizations in connection with the existing one. Thus its purpose is to give new directions and new insight to the existing problems.

The word 'Re-search' is a combination of two English words 'Re' which means repeated and 'search' which means discover. So research means to verify the old facts and at the same time to discover new facts. So, in simpler words, research means to find out those unknown facts working behind social phenomena which lead to the discovery of many uniform laws underlying human behaviour.

A social research encompasses scientific investigations conducted in the field of social sciences and also in behavioural sciences. Social research is a very broad category within which there are many sub classes. Social research involves application of scientific methods for the understanding, studying and analyzing of social life in order to modify or act or verify the existing knowledge as a system.

The main aim of social research is the comprehensive analysis of the social reality to discover new laws and to find out the causes of different social problems emerging in social life from time to time. It is a scientific approach of adding to the

knowledge about society and social phenomena. It is guided by certain objectives enumerated as below.

Prof. Young has given the following steps of the scientific method:

- (a) Formation of hypothesis.
- (b) Observation and collection of facts.
- (c) Classification and tabulation of facts.
- (d) Generalisation.
- (e) Formation of theory.

Not only in the social research, but in the other branches of research, whether they be connected with natural-sciences or social sciences, certain steps have to be taken on scientific lines. These steps consist of a number of closely related activities. So independent are these activities that the first step of a research largely determines the nature of the last. If systematic steps have not been taken into account, serious difficulties may arise. They can be avoided only when each step has been adopted in the research process. Although, according to the nature of the problem, the scientific procedure to be adopted may differ, but, generally, the scientific method of study follows certain steps.

1.6 Key Concepts/Words

Research: Research means discovery of some hidden facts or laws. Research aims at discovering the truth. Research is undertaken to discover answer to questions by applying scientific methods. Research may be defined as a careful critical inquiry or examination in seeking facts or principles with the discovery of new facts, old conclusions or theories may be either rejected or modified. Research is necessary to examine the extent of validity of the old conclusions or to find out some new facts and generalizations in connection with the existing one. Thus its purpose is to give new directions and new insight to the existing problems.

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Social Research: A social research encompasses scientific investigations conducted in the field of social sciences and also in behavioural sciences. Social research is a very broad category within which there are many sub classes. Social research involves application of scientific methods for the understanding, studying and analyzing of social life in order to modify or act or verify the existing knowledge as a system.

Hypothesis: Before conducting research, a scientist must have some idea about the path which he is to take and the goal which he is to achieve. To achieve this goal, he must form a hypothesis. It is based on estimation or imagination and if we fail to achieve the set goal, then we may change our hypothesis. Our research is to be based on hypothesis. It is an idea about the direction in which a scientist is to proceed, however, vague it may be. Research cannot be conducted without a hypothesis. A hypothesis is a theory, the validity of which is yet to be tested. If is verified, then the hypothesis is established as a theory. So, a hypothesis is a mental construct which is yet to be verified.

Collection of data: After the formation of hypothesis, the next step of scientific enquiry is the collection of data. In social research, different methods such as observation, questionnaire, interview survey method or case study method may be employed to collect the facts. The nature of the problem decides which method of enquiry is to be employed. For instance, if the emotions of the units are to be studied, then the interview method may be applied and in case the units are scattered over a wider area, then the questionnaire is the best method of study. Different ways of life may be studied by observation. In brief, a scientist must select that method of enquiry which helps him to collect valid relevant facts.

Classification and Tabulation of data: After the collection of data, these are to be classified into different categories according to the nature of the units: The whole data are divided into different categories on the basis of the differences present in different units. Thus classification means arranging the data in different classes or groups according to their similarities or dissimilarities. In the mass of data, by classification, an order is created. After classification, the data are placed in the

form of tables in order to facilitate generalization. Tables make the data more precise and organised and it becomes easier to make a comparative study.

Generalisation: After the data have been collected and placed in tables, then generalizations are made to draw the inferences. Broad conclusions are drawn on the basis of the generalizations. Once hypothesis has been proved to be correct as a result of verification, certain general principles can be laid down and prepared. These general principles are based on the results of the analysis and verification of the data scientifically tabulated, systematised and classified. These generalisations are the principles which prove that under certain circumstances certain results takes place.

Two method are employed for generalization:

- (1) Logical method and (2) Statistical method.

Inductive and Deductive Method (Formation of Theory): After the collection of data, generalisation is made by two methods-inductive and deductive and a theory is established. By the method of induction, generalisation is made on the basis of information collected from individual units. By this method laws are made on the basis of particular cases and thus applying them to the whole. For instance, we observe that Ram dies and Sham also dies and from these specific cases, a scientist can draw the conclusion that everybody dies or man is mortal.

In the deductive method, general information is verified by applying it to specific cases. For example, when a scientist gets the idea that everyone is to die. In order to verify it, he studies specific cases and establishes a universal theory that every living being is to die. The method of deduction and induction are interdependent. A hypothesis is formulated on the basis of the method of induction. And then, with the application of deduction, after verifying the information collected by the inductive method, a universal theory is formed.

Bibliography: In the research, use of library and survey of literature is n important step. For correct study and survey, it is necessary to prepare a list of the books consulted or that may be consulted. Bibliography will help us to acquire correct knowledge of the problem.

1.7 Exercise Questions

1. Define social research and discuss its objectives?
2. Highlight different steps in social research.

1.8 Short Questions

1. Research
2. Social Research
3. Objectives of Social Research
4. Generalisations
5. Hypothesis
6. Inductive and Deductive method
7. Preparation of report

1.9 Reading List

- Goode, W.J. and Hatt, P.K. *Methods in Social Research*, New York: McGraw Hill Company, 1981
- Young, P.V. *Scientific Social Surveys and Research*, New Delhi: Prentice Hall of India, 1969
- Selltiz, C, Jahoda, M, Morton, D and Cook, S.W. *Research Methods in Social Relations*, New York : Holt, Rinchart and Winston, 1959

SCIENTIFIC METHOD

Defining the Scientific Method :

The scientific method is a logically stepped process used for investigating and acquiring or expanding our understanding. I threw around some odd terminology, so let us take a look at what it means. 'Logically stepped' is a fancy way of saying there is a step-by-step process from beginning to end, and the steps make sense when you put them together. You start at one, go through six and voila - you have the truth. Starting at step two, three or six means you will more than likely come to an incorrect truth, and your findings will be erroneous.

Stages of the Scientific Method

Some of you may be familiar with the scientific method, so this should act as a good reminder of the basics and provide additional information on how Sociological and psychological research is conducted. If you are unfamiliar with the method, or it has been a long time, don't worry, as I will put enough information and detail in the following descriptions of the steps to explain what's going on.

Step 1: Ask a question.

You can't research something and learn about it if you don't have a question to answer. Where you draw your question from can be anywhere, such as personal observations of the natural world, professional literature or previous experiments.

We will look at a famous experiment, so you can do some additional research if you so choose. In the early 1960s, Yale psychologist Stanley Milgram posed the question, 'What could a person in authority make another person do?' He was inspired by the Jewish Holocaust and the soldiers of the concentration camps. Could a person in authority order another person to kill someone?

Step 2: Background research.

There is no reason to reinvent the wheel. Looking into background research and consulting with peers helps inform you of what has been done before, how it has been done, what gaps there are in the literature and what still needs to be done.

Stanley Milgram drew from many sources on obedience and following instructions. He asked his peers, 'How many people would kill a person if instructed to do so?'

His peers estimated that less than 1% of the population would follow the authorities' orders and kill someone. He also looked historically, since Milgram was inspired by the Nazi concentration camps.

Step 3: Form a hypothesis.

A hypothesis is a type of prediction, an if-then statement. This is where you have an idea of which part of the question will be tested, how it will be tested and what you expect the results to be. In addition, this is where you begin to design your experiment, because your experiment is supposed to test the accuracy of your hypothesis.

One of Milgram's hypotheses stated, 'If a person is instructed by an authority figure, such as a psychologist in a lab, then they will follow the instructions even if the instructions might lead to harming another individual.' I say 'one of the hypotheses' because there were several variants to the original design, but we don't need to focus on them. Milgram's hypothesis is an if-then statement (IF a person with authority instructs another individual to harm someone, THEN they will do it), predicting what he believes will happen in the experiment.

Step 4: Test the hypothesis and collect data.

At this step, you conduct your study and test whether your hypothesis is correct. This can take many forms, from simple observations to elaborate experiments that span years.

Milgram's experiment required three people. They would arrive at about the same time and the experimenter would designate the second person as a teacher and the third as the learner. The learner was placed in a chair in room A and hooked up to electrodes. The learner would also explain that he had a prior heart condition, but the experimenter in the lab coat would say the shocks are not dangerous.

The teacher would then be seated in front of a large box with switches ranging from 15 volts to over 400 XXX dangerous. The teacher would then read word pairs, and the learner would try to repeat them back, and if he was incorrect, he would receive a shock and the teacher would hear a loud BZZ. Every incorrect word pair would increase the shock.

The trick was, the experimenter and the learner were in on the experiment. The learner would intentionally get words wrong and only pretend to be shocked. At a certain point, the learner would complain of his heart condition. At a later point, he would stop responding. All the while the experimenter would stand behind the teacher and say things like, 'The experiment requires you to continue,' and 'I will take full responsibility for what happens,' if the teacher ever faltered or hesitated.

Scientific Method: Steps

The steps of research by the scientific method can be summarized like this:

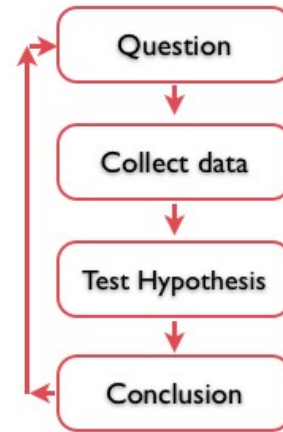
1. Formulate a Question

Define the Question

Review the Literature

Create a Hypothesis

Research starts with a question or assumption you have on a real world phenomenon. Narrow it down to a research question that defines what you want to figure out and review the research and literature already done on that subject. With an understanding of your subject and a well defined question you form an hypothesis that will be tested against an opposite assumption called the null hypothesis.

**2. Collect Data**

Preparation: Make Hypothesis Testable (Operationalization)

Preparation: Design the Study

Conduct the Experiment or Observation

Operationalize the hypothesis to be both testable and falsifiable. Then design a study and construct a test or experiment to collect data. Be aware of validity when choosing variables, especially when studying people. You might not be measuring what you think you are measuring. Qualitative studies tends to have more open questions and hypotheses while quantitative research have an experimental approach focusing more on counting and classifying observations.

3. Test Hypothesis

Organize the Data

Analyse the Results

Check if the Results Support your Hypothesis

Organize the data and analyze it to see if it supports or rejects your hypothesis. The exact type of test used depends upon many things, including the field, the type of data and sample size, among other things. The vast majority of scientific research is ultimately tested by statistical methods, all giving a degree of confidence in the results.

4. Conclusion

When looking at your results it is important to be open for other possible explanations. Could the results you got be generalized to the real world? Maybe other variables explain the question better than the ones you chose for your hypothesis? Remember to consider experimental errors and problems with validity and reliability in your conclusion. If your assumption on what you studied was right and your hypothesis was supported by the test, you could consider if it fits in a bigger picture with other research that together could form a theory. If the hypothesis failed you could try to tweak it or make a new hypothesis, corrected with your newly analysed results and test again. Often the conclusion will lead you on to further hypotheses about the phenomenon that suggest a direction for more research by yourself or other scientists.

"Science is a verb"

"Homeopaths gets on my nerves with the old; - 'well, science doesn't know everything' ... Science knows it doesn't know everything ... or it'd stop." Dara O'Briain

You might have come across the expression «science is a verb». This expression is an answer to the misconception of some people that science is merely accumulation of static knowledge. But what we consider to be knowledge is under constant review and sometimes it changes. Science as a method of research make all theories subject to change with discovery of new evidence. New evidence create new explanations of phenomena, or substantiate the old theories and make us increasingly sure of their soundness.

Why use the Scientific Method?

The scientific method is a standard on how to do research that aims to discover new knowledge. Research in the broadest sense of the word includes any gathering of data, information and facts for the advancement of knowledge, but doing science restricts the research to a method that is focused on getting accurate and, most often, narrow conclusions.

Having done research by the scientific method makes it transparent and explorable. All published results from this method is reviewed by scientists against other findings or explanations to see if it is valid, or retested to see if the results were reliable. This is why publishing and review of research is such a big deal for scientists.

What are the Characteristic of Scientific Methods?

The scientific method is the system used by scientists to explore data, generate and test hypotheses, develop new theories and confirm or reject earlier results. Although the exact methods used in the different sciences vary (for example, physicists and psychologists work in very different ways), they share some fundamental attributes that may be called characteristics of the scientific method:

CHARACTERISTICS OF THE SCIENTIFIC METHOD

1. Empirical

The scientific method is empirical. That is, it relies on direct observation of the world, and disdains hypotheses that run counter to observable fact. This contrasts with methods that rely on pure reason (including that proposed by Plato) and with methods that rely on emotional or other subjective factors.

2. Replicable

Scientific experiments are replicable. That is, if another person duplicates the experiment, he or she will get the same results. Scientists are supposed to publish enough of their method so that another person, with appropriate training, could replicate the results. This contrasts with methods that rely on experiences that are unique to a particular individual or a small group of individuals.

3. Provisional

Results obtained through the scientific method are provisional; they are (or ought to be) open to question and debate. If new data arise that contradict a theory, that theory must be modified. For example, the phlogiston theory of fire and combustion was rejected when evidence against it arose.

4. Objective

The scientific method is objective. It relies on facts and on the world as it is, rather than on beliefs, wishes or desires. Scientists attempt (with varying degrees of success) to remove their biases when making observations.

5. Systematic

Strictly speaking, the scientific method is systematic; that is, it relies on carefully planned studies rather than on random or haphazard observation. Nevertheless, science can begin from some random observation. **Characteristic Features of Scientific Methods**

From the above discussion it can be said that the procedure line of action and other details are indefinite and not fixed in scientific methods. Some experts consider it as an important reason that why these methods have not attained status of independent and distinctive methods of teaching and learning science in themselves. But still, there are certain features which are found in scientific

methods, and which play important role in making such methods scientific. Some of the important features inherent in scientific methods are as follows:

6. Objective:

In their approach, scientific methods are found to be quite objective. Such methods do not rely on any kind of biases and prejudices, but they are based on the foundation of scientific facts and proofs.

Verifiable: Scientific methods give more importance or consideration to the proper verification of the facts. Conclusions are drawn on the basis of only such facts for which there are valid and proper proofs available. In case of non availability of such valid proofs, no beliefs or opinions will be used as basis of conclusions.

7. Definite:

Although some experts are of the view that scientific methods are indefinite in nature, but still there is content of definiteness in the processes which are being employed in such methods. It is as a result of this feature of scientific methods that conclusions drawn from such methods are found to be more reliable and valid and are consider to be free from all kinds of biases and truthlessness.

8. Predictable:

An important feature of outcomes or conclusions drawn from the use of such methods is that they cannot be used to guide in the present time, but on their basis, future predictions can be made by the observer. Through the properly generalised results of the scientific method, one can predict in the present that what will happen in a given situation under the known circumstances to particular object or phenomena in the future. It is because of this reason that such methods are widely used by scientists and researchers.

9. General:

The conclusions drawn from making use of scientific methods consist of marked featured of generality in them. This statement has two implications. First, that inductive method is being used in making generalisations out of the particular happenings or events. Secondly, principles established through scientific methods are universal in nature by which they can be applied generally in other situations of similar kinds.

10. Modifiable:

An important feature of results or conclusions drawn from making use of scientific methods are that they cannot be considered as final at any time. The main reason of this is that they are non- static in nature. Such conclusions are open to continuous verification and further studies. On the basis of informations

obtained through new innovations and experiments, the information or fact what is considered to be true today can prove to be wrong tomorrow or in the near future.

Thus, there is content of non-rigidity in the process adopted for discovering facts. Not only this, these methods do not stand in the ways of bringing desired modifications and changes in the scientific laws and principles which were being established earlier.

From the features of scientific methods discussed above, one can conclude that all of them are also found in science. It is because of this reason that sometimes people consider science and scientific methods as interchangeable terms. However, in reality, both these concepts are complementary to each other.

Whatever progress is taking place in the scientific pursuit is all due to the adoption of various scientific methods. While on the other hand, scientific methods help human beings to understand the facts and principles of science and to apply them in their practical life, as a result of which our life has become very comfortable and smooth in comparison to earlier times.

Before discussing about the steps which are generally taken while making use of scientific methods, it is first necessary to discuss the significance of scientific methods. Today, such methods are used in all kinds of studies made in different branches of science.

These methods are considered to be important and desirable as they lay emphasis on systematic and careful study of the situation or object. Through such methods, it becomes possible to collect different kinds of informations and scientific facts by proper observation, experimentation and testing procedures.

As said that in scientific methods, data are being classified and then interpretations are made from them, as a result of which observer gets the chance to properly analyse the object or situation. With this, chances to get more accurate kind of results get increased. Not only this, results or conclusions drawn by making use of such methods can be verified further, as a result of which more sound and logical scientific principles and laws can be framed.

Not only this, teachers gain some special kind of advantages by making use of such methods in teaching process, some of which are as follows:

- i. Through these methods, students get huge opportunities to play active roles in teaching process. Usually they gain important knowledge through their own experiences as a result of which importance of teacher gets diminished to some extent and students become self-dependent. Such kind of condition helps in developing an appropriate kind of atmosphere in the classroom where students can gain science knowledge successfully and effectively.

- ii. Through scientific methods, students learn to identify and formulate scientific problems properly and in well organised manner.
- iii. Through scientific methods, students get trained in making use of techniques of information processing.
- iv. Through scientific methods, power of reflective thinking and reasoning among the students get developed with the help of which they begin to take decisions on logical and rational grounds.
- v. Through scientific methods, quality of intellectual honesty got developed among the students and they become able to analyse all the pros and cons of situation before taking any kind of decision.
- vi. Through scientific methods, students learn to establish relationship and patterns amongst various things and concepts.
- vii. Through scientific methods, students become efficient to discover new means to find out truth existing beneath the surface of the matter.

Advantages and disadvantages of scientific method

No concept can be understood properly without proper analysing its all aspects. As use of scientific methods consists of some advantages, there are some disadvantages also which are inherent in these methods, mentions of some of which are as follows:

For using these methods, it is necessary to make proper planning, for which a lot of time is required. Thus, these methods are considered as time consuming by large number of experts.

Although these methods help in drawing logical and rational conclusions to considerable extent, but it is not possible to impart education of such a complex subject as science through them. They cannot be considered as full fledged methods of learning science because of which it becomes necessary to make use of other methods of teaching also along with them.

Generally, for proper implementation of such methods, there should be proper provision of facilities and materials, which is found to be unsatisfactory in majority of schools in our nation. Not only this, our school teachers do not possess much knowledge of these methods, as a result of which, they fail to implement them successfully in their classes.

Such methods cannot be used for all the students but they are suitable only for the bright and creative students. It becomes difficult for the teacher to make use of these methods in classroom as students of varying mental capacities take education in classroom and it is not possible for the teacher to employ these

methods only on the bright students separately as usually they face problem of lack of time.

Importance of Scientific Research

Scientific research helps us understand the world around us.

Scientific research helps us understand the world around us. Research helps people understand how things work and why certain things look or act the way they do. In addition to satisfying curiosity, research can also help save or prolong human life. Scientific research contributes to knowledge about how our bodies work, diet and nutrition, preventing and treating disease and safety considerations. It also leads to inventions of conveniences such as cell phones and microwaves.

What is Scientific Research?

Scientific research consists of inquiries, observations and experiments. It attempts to use these to answer questions about what causes various phenomena. It is important to note that scientific research does not provide absolute answers to questions, but instead gives probable answers based on evidence gathered and current knowledge. New information can lead to the rejection of ideas previously believed to be true.

Guidelines For Scientific Research

In order for research to be considered scientific, it must be conducted in accordance with the scientific method. This method creates conditions under which it is most likely that conclusions are drawn based on evidence rather than conjecture, superstition or common knowledge.

The scientific method begins with proposing a question to be answered. The question must be testable--that is, scientists should be able to answer it by studying data, conducting experiments and interpreting results. It also should not suggest a particular answer.

After proposing a question, scientists review prior research on the topic to learn what other scientists have done and believe. This stops them from wasting time repeating research that has already been done.

As a result of this research, the scientist creates a hypothesis, or possible answer to the question. A hypothesis must be falsifiable; the scientist should be able to provide examples of evidence that would disprove the hypothesis.

The scientist then conducts an experiment to test the hypothesis. Most experiments require two groups or objects to be treated the same except for one respect. By changing one variable, the scientist hopes to hone in on what is causing something to occur.

Once the experiment is complete, researchers analyze the results using statistical calculations and draw conclusions. They then let others in the scientific community know about their experiment and conclusions, usually by publishing papers. Other researchers then try the same experiment to see if they get the same results. This helps determine whether the conclusion drawn was valid. If researchers do not get the same results, they examine the way the original experiment was conducted and make a new hypothesis about why the results were different.

Significant Achievements In History

People have been trying to understand how the world works since ancient times. Many ancient Greeks were scientific researchers, asking questions and using their observations to try to answer questions. One of the most significant was Hippocrates, who was the first scientist to hypothesize that diseases had natural causes and that brain injuries could affect the body.

There were no large-scale scientific research projects until the mid 1600s. During this period, scientists began researching diverse topics such as the volume of gas and what types of organisms cause disease. It is during this period that Newton hypothesized about the existence of gravity and the laws of motion.

Scientific research during the late 1800s and early 1900s led to the invention of the airplane and motor car, as well as increasing our understanding of what causes disease.

Scientific Research Today

Today, scientists are researching important questions related to our lives. For example, researchers have been hypothesizing about the cause and cure of AIDS since its emergence in the early 1980s; while there is no cure available today, research has led to the development of medication that can prolong the lives of AIDS sufferers. Researchers in other areas are working on questions such as how to slow down environmental decay, whether other planets contain life or are suitable for human habitation, or how to use technology to create more energy-efficient automobiles.

Question or Hypothesis: The first stage of scientific research is to formulate a question about the area or subject matter in which the research will be performed. The question can start very large, but must eventually be narrowed into a hypothesis, which is a prediction about what the results of the experiment will achieve. The key is to have a very specific question and hypothesis, but also one that is testable, as there can be no experimentation if the assertion cannot be proven.

Experiment Design: One of the most creative and also most difficult aspects of the scientific research process is experiment design. Most experiments can be

performed in a variety of manners, some potentially more successful than others. Many experiments do not have a clear-cut manner in which they should be performed; therefore, the experiment design is one of the central keys to success. Variables are used throughout scientific experiments in various ways. "Independent" variables alter throughout the course of the experiment. "Dependent" variables change in response to the constant. "Constant" variables stay the same throughout the course of the experiment. Each variable is merely statistical data that focus on gaining key points of information from the experiment, in an attempt to prove the change or alteration predicted in the hypothesis. The sample size must also be large enough to warrant the results as valid and statistically significant.

Observation and Analysis: Observing or performing the experiment is typically the easier and more monotonous job of the scientific research process, as usually it requires repeating a process as dictated by the experimental design. The key to analysis is to quantify the variables taken from observing the experiment and make them into understandable statistics. The results should show trends that are statistically significant, which can then be measured against the initial hypothesis.

Conclusion: The last part of the scientific method includes taking the results of the data and analysis, comparing them with the hypothesis, and simply determining whether it was correct or incorrect. Conclusions often lead to further research. Normally the results are written in a research-paper format and often peer-reviewed against other members of the scientific community.

Characteristic Features of Scientific Methods, Conclusions and Discussion:

From the above discussion it can be said that the procedure line of action and other details are indefinite and not fixed in scientific methods. Some experts consider it as an important reason that why these methods have not attained status of independent and distinctive methods of teaching and learning science in themselves. But still, there are certain features which are found in scientific methods, and which play important role in making such methods scientific. Some of the important features inherent in scientific methods are as follows:

Objective: In their approach, scientific methods are found to be quite objective. Such methods do not rely on any kind of biases and prejudices, but they are based on the foundation of scientific facts and proofs.

Verifiable: Scientific methods give more importance or consideration to the proper verification of the facts. Conclusions are drawn on the basis of only such facts for which there are valid and proper proofs available. In case of non availability of such valid proofs, no beliefs or opinions will be used as basis of conclusions.

Definite: Although some experts are of the view that scientific methods are indefinite in nature, but still there is content of definiteness in the processes which are being employed in such methods. It is as a result of this feature of scientific

methods that conclusions drawn from such methods are found to be more reliable and valid and are considered to be free from all kinds of biases and truthlessness.

Predictable: An important feature of outcomes or conclusions drawn from the use of such methods is that they cannot be used to guide in the present time, but on their basis, future predictions can be made by the observer. Through the properly generalised results of the scientific method, one can predict in the present that what will happen in a given situation under the known circumstances to particular object or phenomena in the future. It is because of this reason that such methods are widely used by scientists and researchers.

General : The conclusions drawn from making use of scientific methods consist of marked features of generality in them. This statement has two implications. First, that inductive method is being used in making generalisations out of the particular happenings or events. Secondly, principles established through scientific methods are universal in nature by which they can be applied generally in other situations of similar kinds.

Modifiable: An important feature of results or conclusions drawn from making use of scientific methods are that they cannot be considered as final at any time. The main reason of this is that they are non-static in nature. Such conclusions are open to continuous verification and further studies. On the basis of information obtained through new innovations and experiments, the information or fact what is considered to be true today can prove to be wrong tomorrow or in the near future. Thus, there is content of non-rigidity in the process adopted for discovering facts. Not only this, these methods do not stand in the way of bringing desired modifications and changes in the scientific laws and principles which were being established earlier.

From the features of scientific methods discussed above, one can conclude that all of them are also found in science. It is because of this reason that sometimes people consider science and scientific methods as interchangeable terms. However, in reality, both these concepts are complementary to each other.

Whatever progress is taking place in the scientific pursuit is all due to the adoption of various scientific methods. While on the other hand, scientific methods help human beings to understand the facts and principles of science and to apply them in their practical life, as a result of which our life has become very comfortable and smooth in comparison to earlier times.

Before discussing about the steps which are generally taken while making use of scientific methods, it is first necessary to discuss the significance of scientific methods. Today, such methods are used in all kinds of studies made in different branches of science. These methods are considered to be important and desirable as they lay emphasis on systematic and careful study of the situation or object. Through such methods, it becomes possible to collect different kinds of

informations and scientific facts by proper observation, experimentation and testing procedures.

Scientific inquiry

The goal of a scientific inquiry is to obtain knowledge in the form of testable explanations that can predict the results of future experiments. This allows scientists to gain an understanding of reality, and later use that understanding to intervene in its causal mechanisms (such as to cure disease). The better an explanation is at making predictions, the more useful it is, and the more likely it is to be correct. The most successful explanations, which explain and make accurate predictions in a wide range of circumstances, are called scientific theories.

Most experimental results do not result in large changes in human understanding; improvements in theoretical scientific understanding is usually the result of a gradual synthesis of the results of different experiments, by various researchers, across different domains of science. Scientific models vary in the extent to which they have been experimentally tested and for how long, and in their acceptance in the scientific community. In general, explanations become accepted by a scientific community as evidence in favor is presented, and as presumptions that are inconsistent with the evidence are falsified.

Properties of scientific inquiry

Muybridge's photographs of *The Horse in Motion*, 1878, were used to answer the question whether all four feet of a galloping horse are ever off the ground at the same time. This demonstrates a use of photography in science.

Scientific knowledge is closely tied to empirical findings, and always remains subject to falsification if new experimental observation incompatible with it is found. That is, no theory can ever be considered completely certain, since new evidence falsifying it might be discovered. If such evidence is found, a new theory may be proposed, or (more commonly) it is found that minor modifications to the previous theory are sufficient to explain the new evidence. The strength of a theory is related to how long it has persisted without falsification of its core principles.

Confirmed theories are also subject to subsumption by more accurate theories. For example, thousands of years of scientific observations of the planets were explained almost perfectly by Newton's laws. However, these laws were then determined to be special cases of a more general theory (relativity), which explained both the (previously unexplained) exceptions to Newton's laws as well as predicting and explaining other observations such as the deflection of light by gravity. Thus independent, unconnected, scientific observations can be connected to each other, unified by principles of increasing explanatory power.

Since every new theory must explain even more than the previous one, any successor theory capable of subsuming it must meet an even higher standard,

explaining both the larger, unified body of observations explained by the previous theory and unifying that with even more observations. In other words, as scientific knowledge becomes more accurate with time, it becomes increasingly harder to produce a more successful theory, simply because of the great success of the theories that already exist. For example, the theory of evolution explains the diversity of life on Earth, how species adapt to their environments, and many other patterns observed in the natural world; its most recent major modification was unification with genetics to form the modern evolutionary synthesis. In subsequent modifications, it has also subsumed aspects of many other fields such as biochemistry and molecular biology.

Beliefs and biases

Scientific methodology directs that hypotheses be tested in controlled conditions which can be reproduced by others. The scientific community's pursuit of experimental control and reproducibility diminishes the effects of cognitive biases. For example, pre-existing beliefs can alter the interpretation of results, as in confirmation bias; this is a heuristic that leads a person with a particular belief to see things as reinforcing their belief, even if another observer might disagree (in other words, people tend to observe what they expect to observe).

A historical example is the conjecture that the legs of a galloping horse are splayed at the point when none of the horse's legs touches the ground, to the point of this image being included in paintings by its supporters. However, the first stop-action pictures of a horse's gallop by Eadweard Muybridge showed this to be false, and that the legs are instead gathered together. Another important human bias that plays a role is a preference for new, surprising statements (see appeal to novelty), which can result in a search for evidence that the new is true.

In contrast to the requirement for scientific knowledge to correspond to reality, beliefs based on myth or stories can be believed and acted upon irrespective of truth, often taking advantage of the narrative fallacy that when narrative is constructed its elements become easier to believe. Myths intended to be taken as true must have their elements assumed a priori, while science requires testing and validation a posteriori before ideas are accepted.

Elements of the scientific method

There are different ways of outlining the basic method used for scientific inquiry. The scientific community and philosophers of science generally agree on the following classification of method components. These methodological elements and organization of procedures tend to be more characteristic of natural sciences than social sciences. Nonetheless, the cycle of formulating hypotheses, testing and analyzing the results, and formulating new hypotheses, will resemble the cycle described below.

Four essential elements of the scientific method are iterations, recursions, interleavings, or orderings of the following:

Characterizations (observations, definitions, and measurements of the subject of inquiry)

Hypotheses (theoretical, hypothetical explanations of observations and measurements of the subject)

Predictions (reasoning including logical deduction from the hypothesis or theory)

Experiments (tests of all of the above)

Each element of the scientific method is subject to peer review for possible mistakes. These activities do not describe all that scientists do (see below) but apply mostly to experimental sciences (e.g., physics, chemistry, and biology). The elements above are often taught in the educational system as "the scientific method".

The scientific method is not a single recipe: it requires intelligence, imagination, and creativity. In this sense, it is not a mindless set of standards and procedures to follow, but is rather an ongoing cycle, constantly developing more useful, accurate and comprehensive models and methods. For example, when Einstein developed the Special and General Theories of Relativity, he did not in any way refute or discount Newton's Principia. On the contrary, if the astronomically large, the vanishingly small, and the extremely fast are removed from Einstein's theories – all phenomena Newton could not have observed – Newton's equations are what remain. Einstein's theories are expansions and refinements of Newton's theories and, thus, increase our confidence in Newton's work.

A linearized, pragmatic scheme of the four points above is sometimes offered as a guideline for proceeding:

Define a question

Gather information and resources (observe)

Form an explanatory hypothesis

Test the hypothesis by performing an experiment and collecting data in a reproducible manner

Analyze the data

Interpret the data and draw conclusions that serve as a starting point for new hypothesis

Publish results

Retest (frequently done by other scientists)

The iterative cycle inherent in this step-by-step method goes from point 3 to 6 back to 3 again. While this schema outlines a typical hypothesis/testing method, it should also be noted that a number of philosophers, historians and sociologists of science (perhaps most notably Paul Feyerabend) claim that such descriptions of scientific method have little relation to the ways science is actually practiced.

The "operational" paradigm combines the concepts of operational definition, instrumentalism, and utility: The essential elements of scientific method are operations, observations, models, and a utility function for evaluating models.

Operation – Some action done to the system being investigated

Observation – What happens when the operation is done to the system

Model – A fact, hypothesis, theory, or the phenomenon itself at a certain moment

Utility Function – A measure of the usefulness of the model to explain, predict, and control, and of the cost of use of it. One of the elements of any scientific utility function is the refutability of the model. Another is its simplicity, on the Principle of Parsimony more commonly known as Occam's Razor.

Characterizations

The scientific method depends upon increasingly sophisticated characterizations of the subjects of investigation. (The subjects can also be called unsolved problems or the unknowns.) For example, Benjamin Franklin conjectured, correctly, that St. Elmo's fire was electrical in nature, but it has taken a long series of experiments and theoretical changes to establish this. While seeking the pertinent properties of the subjects, careful thought may also entail some definitions and observations; the observations often demand careful measurements and/or counting.

The systematic, careful collection of measurements or counts of relevant quantities is often the critical difference between pseudo-sciences, such as alchemy, and science, such as chemistry or biology. Scientific measurements are usually tabulated, graphed, or mapped, and statistical manipulations, such as correlation and regression, performed on them. The measurements might be made in a controlled setting, such as a laboratory, or made on more or less inaccessible or unmanipulatable objects such as stars or human populations. The measurements often require specialized scientific instruments such as thermometers, spectrosopes, particle accelerators, or voltmeters, and the progress of a scientific field is usually intimately tied to their invention and improvement.

Uncertainty

Measurements in scientific work are also usually accompanied by estimates of their uncertainty. The uncertainty is often estimated by making repeated measurements

of the desired quantity. Uncertainties may also be calculated by consideration of the uncertainties of the individual underlying quantities used. Counts of things, such as the number of people in a nation at a particular time, may also have an uncertainty due to data collection limitations. Or counts may represent a sample of desired quantities, with an uncertainty that depends upon the sampling method used and the number of samples taken.

Definition

Measurements demand the use of operational definitions of relevant quantities. That is, a scientific quantity is described or defined by how it is measured, as opposed to some more vague, inexact or "idealized" definition. For example, electrical current, measured in amperes, may be operationally defined in terms of the mass of silver deposited in a certain time on an electrode in an electrochemical device that is described in some detail. The operational definition of a thing often relies on comparisons with standards: the operational definition of "mass" ultimately relies on the use of an artifact, such as a particular kilogram of platinum-iridium kept in a laboratory in France.

The scientific definition of a term sometimes differs substantially from its natural language usage. For example, mass and weight overlap in meaning in common discourse, but have distinct meanings in mechanics. Scientific quantities are often characterized by their units of measure which can later be described in terms of conventional physical units when communicating the work.

New theories are sometimes developed after realizing certain terms have not previously been sufficiently clearly defined. For example, Albert Einstein's first paper on relativity begins by defining simultaneity and the means for determining length. These ideas were skipped over by Isaac Newton with, "I do not define time, space, place and motion, as being well known to all." Einstein's paper then demonstrates that they (viz., absolute time and length independent of motion) were approximations. Francis Crick cautions us that when characterizing a subject, however, it can be premature to define something when it remains ill-understood. In Crick's study of consciousness, he actually found it easier to study awareness in the visual system, rather than to study free will, for example. His cautionary example was the gene; the gene was much more poorly understood before Watson and Crick's pioneering discovery of the structure of DNA; it would have been counterproductive to spend much time on the definition of the gene, before them.

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QUESTIONS

Question 1. What do you mean understand by Scientific Method? Discuss its importance in Scientific Research

Question 2. What do you mean by Scientific Methods? Discuss the Characteristic Features of Scientific Methods

Question 3. Discuss the Advantages and disadvantages of scientific method

Question 4. Define Scientific Methods, What are the various CHARACTERISTICS OF THE SCIENTIFIC METHOD

Question 5. Discuss various Stages of the Scientific Method

HYPOTHESIS**Structure**

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Types of Hypothesis
 - 3.2.1 Working Hypothesis
 - 3.2.2 Formal Hypothesis
 - 3.2.3 Null Hypothesis
- 3.3 Cautions in Formulating Hypothesis
- 3.4 Common Mistakes in Formulating Hypothesis
- 3.5 Hypothesis Testing
- 3.6 Exercise Questions
- 3.7 References

3.0 OBJECTIVES :

After going through this lesson you will be able to

- * define the meaning of Hypothesis
- * explain its various types
- * give details of cautions in formulating Hypothesis
- * point out various common mistakes in Formulating Hypothesis.

3.1 INTRODUCTION :

Hypothesis is a conditional statement about plausible relationships between the independent variable and the dependent variable. If the statement is causal, independent variable is the cause and the dependent variable is the effect. In a hypothesis, a change in the values of the independent variable should lead to a change in the values of the dependent variable. Let us understand it by examples. Suppose we want to find out the relationship between education and voting behaviour. Here the independent variable is 'education' and the dependent variable is 'voting behaviour'. A researcher can formulate following hypotheses: (i) Comparing individuals, an educated person is more likely to vote than an uneducated person, (ii) Comparing individuals, an uneducated person is less likely to vote than an educated person, (iii) Education is not associated with the voting behaviour of an individual. All three statements seek to explore the possible relationships between education and the voting pattern of an individual. We see that the value of dependent variable is conditional to the value of independent variable. If the value changes from 'uneducated' to 'educated', the value of dependent variables also changes from 'less likely to vote' to 'more likely to vote'.

As we start our research process, we begin with a research question in our mind for which we try to find out possible explanations. With our previous knowledge

or based on the existing literature, we do gather some idea about the possible causes of a particular phenomenon. For instance, we know that 'voting behaviour' of an individual is affected by a number of factors, such as, the level of income, the level of education, caste, religion, region, gender, ideology and so on. All these are independent variables in this example. We can formulate hypothesis correlating any one of these independent variables with the dependent variable. But we cannot test all the possible correlations in just one hypothesis. Collating several independent variables in just one hypothesis makes it complex and it becomes difficult to measure the exact value of each variable. In the following chart, we have demarcated independent variables with the dependent variable and formulated a few hypotheses based on them. Keep in mind, we are trying to formulate hypothesis taking into account various factors that determine the voting behaviour of a person.

Independent Variables	Dependent Variable
Level of income	Voting behaviour
Level of education	
Caste	
Gender	
Ideology	
<u>Examples of Hypotheses:</u>	
H1: People with low income in Punjab are more likely to vote in an election than people with high income there.	
H2: Males in Punjab are more likely to participate in voting in an election than females there.	
H3: Ideological affiliation of a person is positively related to his/her participation in voting in an election.	

3.2 TYPES OF HYPOTHESIS :

3.2.1 Working Hypothesis : Such hypotheses are preliminary in nature. They are educated guesses that are subject to revision. They may deal with direct facts or relationships between concepts. These hypotheses guide qualitative research such as field or case studies. They help us formulate formal hypothesis as we progress in our research.

3.2.2 Formal Hypotheses : These hypotheses deal with relationships between the independent and the dependent variables. They are written in formal terms. Sometimes they are written in the form of "If A then B" statement. Our discussion in this chapter is primarily about formal hypotheses. Most of the academic journals use formal hypotheses. Sometimes scholars distinguish between conceptual and operational hypothesis. Conceptual hypothesis is abstract and appears like a proposition. Operational hypotheses are directly related to

empirical data that can be measured with validity and reliability. Operational hypothesis is preferred to conceptual hypothesis because it can be measured with reliability and accuracy.

3.2.3 Null Hypothesis/ Alternative Hypothesis: We want to establish a relationship between two variables in our research. We can formally test the hypothesis by putting forward two hypotheses. One explains our argument and other describes all the other possible outcomes. We say that variable X and variable Y are related. The other possible outcome would be that variable X and variable Y are *not* related. The hypothesis that is supported by you is known as the *alternative* hypothesis. The hypothesis that describes the remaining possible outcomes is generally referred to as the null hypothesis. Formal notation for alternative hypothesis is H_A or H_1 and for the *null* hypothesis is H_0 . It is possible that in some cases you may expect no difference or change as the independent variable changes. In this case, you are endorsing the null hypothesis.

Example of the null hypothesis

H_0 : As a result of the Commonwealth Games in Delhi in 2010, there will be no change in the price of real estates in Delhi

Example of the alternative hypothesis

H_A : As a result of the Commonwealth Games in Delhi in 2010, there will be a significant increase in the price of real estates in Delhi.

Examples of Formal Hypotheses

To avoid any confusion it is better to write a hypothesis in a formal way. We could have written "fertilizer leads to higher productivity". But this could be a conclusion. One way to avoid such confusion is to write it in a formal way:

1. If fertilizer is related to higher productivity, then an increase in the use of fertilizer on a particular soil will lead to an increase in the productivity of wheat.
2. "Measures of a country's ethnic or religious diversity should be associated with a higher risk of civil war". (James Fearon and David Laitin, *American Political Science Review*, February 2003)
3. "Countries with an ethnic majority and a significant ethnic minority are at a greater risk of civil war". (James Fearon and David Laitin, *American Political Science Review*, February 2003)
4. "It is my hypothesis that the fundamental source of conflict in this new world will not be primarily ideological or primarily economic. The great divisions among humankind and the dominating source of conflict will be cultural. Nation states will remain the most powerful actors in world affairs, but the principal conflicts of global politics will occur between nations and groups of different civilizations. The clash of civilizations will dominate global politics. The fault lines between civilizations will be the battle lines of the future." (Huntington, *Foreign Affairs*, 1993)
5. Suicide rate would vary by religion (Protestants, Catholics, Jews); by marital status (single or married); by military status (military or civilian); and by economic condition (boom, bust or stability). (Durkheim)

3.3 CAUTIONS IN FORMULATING HYPOTHESIS :

- 1) It should clearly specify the relationship between the independent and the dependent variable
- 2) It should be concise and specific. A vague and complex hypothesis can be difficult to prove or disprove
- 3) It should be testable and falsifiable
- 4) It should be based on the wisdom of that discipline. If you are formulating a sociological hypothesis, then it should be based on sociological facts and context. You can question the established hypothesis of the subject but it should not appear out of context.
- 5) Hypothesis is not formulated in the form of a question. That becomes a research question.
- 6) Hypothesis should be formulated in a way so that it can be put to empirical tests. We cannot choose a variable which cannot be verified with available tools and techniques. In other words, we should pick up variables which can be measured qualitatively or quantitatively. We should avoid broad concepts (e.g. institutionalization leads to good governance), opinions (e.g. An apple a day keeps doctor away), value judgments (e.g. Students who study in English medium perform better than the students who study in Hindi medium or Islam is more aggressive than other religion), metaphysical concepts (movement of stars guide the behavior of people on earth) or normative statements (older people should play more important role than the younger ones in decision making). Such statements cannot qualify for a hypothesis because they cannot be empirically tested.
- 7) The correlation between the independent and the dependent variable should not be circular. This is a typical tautological problem which should be avoided. For instance, development of a society leads to modernization of people. In this example, we cannot really say whether development leads to modernization or modernization leads to the development of a society. This is a circular argument. Moreover, these concepts are vague, and therefore, this will not qualify for a good hypothesis.

3.4 COMMON MISTAKES IN FORMULATING HYPOTHESIS :

There are a few common mistakes that students make while formulating hypothesis.

- * First, they correlate two concepts rather than variables. Often, they will write, institutionalization leads to good governance. Here, both institutionalization and good governance are vague. Different people will understand these concepts differently. It is better to break these concepts into variables which can be measured easily. For instance, it would be better, if we say, separation of legislative with the executive leads to better implementation of the policy.
- * Second, often the causal relationship between the independent and the dependent variables is missing in the hypothesis. For instance, some people are more likely to vote in an election than the other people. In this example, variables are not causally related. However, there could be hypotheses which are comparative but not necessarily causal.

- * Third, there is a lack of precision. For instance, social capital leads to higher political participation. In this example, social capital is vague. Different people understand this concept differently.
- * Fourth, comparison unit is missing. For instance, urban people vote at high rates. It is a weak hypothesis because it does not specify as to urban people vote at high rates compared to whom.

Check your Progress

1. Define Hypothesis.

2. Working Hypothesis

3. Null Hypothesis

3.5 HYPOTHESIS TESTING :

Once you have formulated hypothesis in your research you need to build the research design and collect the data. Your hypothesis will guide you in collecting the data because you need such data which will prove or disprove your hypothesis. Once you have collected the data, you need to analyse them for hypothesis testing. If your data is quantifiable, there are several statistical techniques which are used to test the hypothesis. Some of the common test statistics are: confidence interval, z-test, t-test, chi-square and p-value significance test. You will study these tests separately.

Steps of Hypothesis Testing :

(a) Write Null and Alternative Hypothesis

Null Hypothesis/ H_0 : The accepted explanation, no change or difference. This is what we're trying to disprove. For instance, *as a result of the commonwealth games in India in 2010, there will be no change in the price of real estates in Delhi.*

Alternative Hypothesis/ H_A : What the researcher thinks might be a better explanation than the null. For instance, *as a result of the commonwealth games in Delhi in 2010, there will be a significant increase in the price of real estates in Delhi.*

(b) Test

The basic aim of the hypothesis testing is to reject H_0 in favor of H_A . We do this with the help of test statistic (confidence interval, z-test, t-test, chi-square and p-value significance test) and critical value. The outcome may falls within the rejection region and we reject H_0 . c.

(c) Choices

Reject H_0 .

Fail to reject H_0 .

(d) Types of possible Errors

Type I:/ Reject H_0 when H_0 is really true.

Type II:/ Fail to reject H_0 when H_0 is really false.

Such errors are possible because the real world is uncertain. One cannot say with certainty whether H_0 is true or false. But we have to take a decision in this uncertainty and thus, there is a chance of committing errors. There are two types of errors which might occur Type I and Type II. Wonnacott and Wonnacott in their book *Introductory Statistics* (1990) uses the famous legal analogy to explain this: "in a murder trial a judge is being asked to decide whether H_0 , the hypothesis that the accused is innocent and the alternative hypothesis H_A , that he is guilty. A Type I error is committed if an innocent man is condemned, while a Type II error occurs if a guilty man is set free." Such problems occur because in all the tests of statistics there are some chances of error. Generally, we set up the statistic level at .05 which means that there are 5 percent chances of error.

3.6 EXERCISE QUESTIONS :

1. What is hypothesis? Formulate two hypotheses using two variables that are education and employment.
2. What is the difference between the null hypothesis and alternative hypothesis?
3. Explain various steps of hypothesis testing.
4. Taking 'exposure of kids to violent films' as the independent variable and 'aggressive behaviour of kids in school' as the dependent variable formulate two hypotheses.
5. What is the difference between Type I error and Type II error? Give an example.

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OBSERVATION

What is Observation?

Origins and History

Observation is a fundamental way of finding out about the world around us. As human beings, we are very well equipped to pick up detailed information about our environment through our senses. However, as a method of data collection for research purposes, observation is more than just looking or listening. Research, simply defined, is “systematic enquiry made public” (Stenhouse, 1975). Firstly, in order to become systematic, observation must in some way be selective. We are constantly bombarded by huge amounts of sensory information. Human beings are good at selectively attending to what is perceived as most useful to us. Observation harnesses this ability; systematic observation entails careful planning of what we want to observe. Secondly, in order to make observation ‘public’, what we see or hear has to be recorded in some way to allow the information to be analysed and interpreted.

The origins of observation as a research technique coincide with the early development of science itself. In the natural sciences, for example, early progress was made primarily through very careful, systematic observation and recording of descriptions of phenomena in the natural world. The work of Charles Darwin would be a good example of the way in which careful observation provided the evidence which enabled him to build his theory of evolution in *The Origin of Species*. Observation in contemporary educational and social research deals with highly complex social phenomena and provides major challenges for the researcher.

The Role and Purpose of Observation

Quantitative Research

The term 'systematic' observation is usually associated with observation undertaken from the perspective of **quantitative research** where the purpose is to provide reliable, quantifiable data. This usually involves the use of some kind of **formal, structured observation** instrument or schedule. The observation method being used will clearly identify: the variables to be observed, perhaps by means of some kind of behavioural checklist; who or what will be observed; how the observation is to be conducted; and when and where the observations will take place.

Qualitative Research

Observation can provide rich qualitative data, sometimes described as 'thick description' (Geertz, 1973), for example, where the relevant phenomena have been carefully observed and detailed field notes have been recorded. Typically, the researcher would not approach the observation with pre-determined categories or questions in mind. Because of this openness, observation in qualitative research is often referred to as unstructured.

Structured observation is more likely to be carried out by those operating from a 'positivist' perspective, or who at least believe it is possible to clearly define and quantify behaviours. Unstructured observation is more likely to be carried out by those operating from an 'interpretive' or 'critical' perspective where the focus is on understanding the meanings participants, in the contexts observed, attribute to events and actions. Positivist and critical researchers are likely to be operating from a 'realist' perspective, namely that there is a 'real world' with 'real impact' on people's lives and this can best be studied by looking at social settings directly.

Many of the issues studied in this unit apply both to quantitative and qualitative approaches but we shall consider them separately.

Ethical Considerations

Observation poses potential ethical problems for researchers. The assumption of participation in research being on the basis of fully informed consent is challenged where there is a need for the observation to be unobtrusive and hence legitimate concern on the part of the researcher over the observer effect, i.e. where the behaviour under consideration will change when those being observed are aware of the presence of the observer. This is precisely the kind of situation which calls for the involvement of an ethics committee to weigh up the desirability of the research to go ahead against the interests of participants being fully informed of the research taking place. Another potential ethical issue arises with observational research as it does with any kind of research, namely, the duty of the researcher to protect participants from any harm. This, for example, would make an observational study of school bullying unethical. If a child were observed bullying another, there would be a responsibility on the part of the researcher to intervene in the situation to prevent any harm.

Types of Observation

1. Casual and Scientific observation –

An observation can be sometimes casual in nature or sometimes it may act scientifically. An observation with a casual approach involves observing the right thing at the right place and also at the right time by a matter of chance or

by luck whereas a scientific observation involves the use of the tools of the measurement, but a very important point to be kept in mind here is that all the observations are not scientific in nature.

2. Natural Observation –

Natural observation involves observing the behaviour in a normal setting and in this type of observation, no efforts are made to bring any type of change in the behavior of the observed. Improvement in the collection of the information and improvement in the environment of making an observation can be done with the help of natural observations.

3. Subjective and Objective observation –

All the observations consist of the two main components, the subject and the object. The subject refers to the observer whereas the object refers to the activity or any type of operation that is being observed. Subjective observation involves the observation of the one's own immediate experience whereas the observations involving observer as an entity apart from the thing being observed, are referred to as the objective observation. Objective observation is also called as the retrospection.

4. Direct and Indirect observation –

With the help of the direct method of observation, one comes to know how the observer is physically present in which type of situation is he present and then this type of observation monitors what takes place. Indirect method of observation involves studies of mechanical recording or the recording by some of the other means like photographic or electronic. Direct observation is relatively more straight forward as compared to the indirect observation.

5. Participant and Non Participant observation –

Participation by the observers with the various types of operations of the group under study refers to the participant type of observation. In participant observation, the degree of the participation is largely affected by the nature of the study and it also depends on the type of the situation and also on its demands. But in the non participant type of observation, no participation of the observer in the activities of the group takes place and also there occurs no relationship between the researcher and the group.

6. Structured and Unstructured observation –

Structured observation works according to a plan and involves specific information of the units that are to be observed and also about the information that is to be recorded. The operations that are to be observed and the various features that are to be noted or recorded are decided well in advance. Such observations involve the use of especial instruments for the purpose of data collection that are also structured in nature. But in the case of the unstructured observation, its basics are diametrically against the structured observation. In such observation, observer has the freedom to note down what he or she feels is correct and relevant to the point of study and also this approach of observation is very suitable in the case of exploratory research.

7. Controlled and Non Controlled observation:

Controlled observations are the observations made under the influence of some of the external forces and such observations rarely lead to improvement in the precision of the research results. But these observations can be very effective in the working if these are made to work in the coordination with mechanical synchronizing devices, film recording etc. Non controlled observations are made in the natural environment and reverse to the controlled observation these observations involve no influence or guidance of any type of external force.

OBSERVATION

The detailed Introduction:

Data collection is one of the crucial stages in social research. Unlike in pure research, tools of data collection have to be constructed in social research. Some of the important tools of data collection are observation, interview, Questionnaire & schedule.

Our Knowledge about the universe begins with observation, practically all human beings are involved in observation. We observe things that happen around us. While on street, in market, at home, at the work place we are constantly involved in observation. But all these cannot be called scientific observations. Observation becomes scientific only when the following characteristics prevail.

CHARACTERISTICS OF OBSERVATION

- 1) It is goal oriented. It must serve a formulated research purpose.
- 2) It must be planned systematically. The stages & substages involved should be clearly designed & stated.
- 3) It should be recorded by the researcher.

4) It must be linked to general theoretical assumption. Therefore, observations can be defined as:

- i) "Systematic Viewing coupled with the consideration of the seen phenomenon.
- ii) "Accurate watching & noting of phenomenon as they occur in nature with regard to cause & effect or mutual relations." (Oxford concise dictionary)

As rightly stated by M.H. Gopal; (An introduction to Research produce in social science) observation is "Seeing with purpose". It is looking closely & purposively at the situation as whole & at the same time in the results without completely losing oneself in the situation.

Components Of Observation:-

Observation is a process which consists of three important aspects:

- 1) Sensation,
- 2) Attention,
- 3) Perception.

1. Sensation stands for a sensory image. The image that our sense organs enable us to achieve. This is a more or less objective or natural stage. The facts present are reported or noticed.

2. Attention means the investigator's ability to pursue the subject under study. The phenomenon under study is studied for a span of time to check out on the validity of sensory report. Success of this stage is largely determined by the investigator's ability to pursue the subject under study.

3. Perception is qualitatively different than the first two stages. It comprises of the interpretation of the sensory report. It is a discretionary stage where facts are „recognized“ understood in a given meaning to be appreciated scientifically.

Observation as a scientific tool of data collection therefore, is not a very simple or easy process. In fact, it is extremely demanding. To use fruitfully, the researcher has to be thoroughly conversant with the problem under study, he has to be trained as well as experienced in field of social research.

Difficulties In The Process Of Observation:-

Herbert Spencer (1820-1903), the English sociologist has mentioned the principle difficulties in the process of observation in his book „study of sociology“ Spencer commented, that many social phenomenon are not directly perceptible.

Many are geographically dispersed. Often researcher involved has put in special efforts to establish facts by putting together many details which are naturally spread out in space & time [E.g. Communal unrest, Discrimination against women] It is a challenging task. Spencer has also given a due mention to the barriers to correct observation in his book, because of the vary nature of this technique of data collection, it has several inbuilt shortcoming which the researcher has to consciously overcome in achieve fruitful results.

Problems Involved In Obserbation Are: -

1) Inadequacies of sense organs – Generally, we tend to regard our sense organs as completely reliable. But it reality our sense organs operate in a highly variable, selective & erratic manner psychological research has proved that what man perceives an particular occasion depends greatly on his state of mind & body at the given point of time. E.g. – A particular painting may appear to be attractive & good to a person who is in a pleasant mood. The same painting will probably look repelling to the same person is a different kind of mental set up.

2) Observation & Inference :-Observation & inference are two sides of the same coin. We infer on the basis of what we observe When observed things are given meaning to within given frame of reference, in relation to the context one is said to be inferring without any frame of reference, in relation to the context one is said to be inferring without any frame to start with, new experience are isolated unidentifiable and meaningless. Therefore, the two are very much connected.

Nevertheless to treat the two are very much connected Nevertheless to treat the two are being the same would be a scientific error. The researcher engages in observation has to consciously distinguish between the two.

3) Observer & Observed :- Social science research involves human observer & human subjects. Both „Human“, Interactions on their relationship cannot be denied. This can prove to be serious hindrance to objective data collection. Therefore, the researcher involved has to be careful & cautions. Special efforts should be mad to curtail the impact of inevitable interactions on the proposed research.

Measures To Ensure Scientific Observation :

It would be an error to say that impartial observation is impossible. The effectiveness & accuracy of the observing method can be certainly be increased by using certain additional aids:

1) Besides the researcher"s observation records, other methods of recording the event under observation like vide camera, tape recorder, still camera should be utilized.

2) In the book of „Research methods in Social Relations, Jahoda selltiz Deutsch & Cook hare suggested the use of checklist

a) Recording of the phenomena or the events should be made in terms of the detailed descriptions of the participants. E.g. – Age, sex, occupation, other personal details.

b) Researcher should note down the environment the setting with in which the event is being observed. It should include various details like e.g.- appropriate norms practiced, types of behavior encouraged etc. This would enable the researcher to attribute correct meaning to the event under observation.

c) Purpose or objective for which participants are gathered together should be clearly noted.

d) To understand & appreciate the phenomenon under observation fully, the exact nature of social behavior, the type of actions & interactions from person to person should be also noted.

e) Besides other details, duration of the event or frequency of certain event should be noted to understand whether it is a regular phenomenon or a rate one.

However, it may not be possible to use the checklist in a circumstance for different reasons, nevertheless special care must be taken to collect lot of information about the phenomenon under observation in order to give correct meaning to it.

3) The technique of observation is a difficulties challenging one because of its very nature. The tool of interview involves verbal interaction; the tool of questionnaire consists of written responses whereas observation operates at a more subtle level. Selection & appointment of experienced observer increaser the possibility of more accurate observation. Observer“s efficiency can be increased by training & special education. Trained & experienced researchers can certainly bring in lot of success in the process of observation.

4) Recent trend in social research is to have two or more people observe the same event. Different observers should make their records independently. When two or more observers are doing their job of recording the same problem they have opportunities to compare their findings & check the bids involved.

Potential Of The Technique Of Observation :

Observation is an important method of social research. It is very much used by the social researcher because it suits the study of the social phenomena. The

techniques occupies a place of importance in social research some of its merits are:-

- 1) Simplest- method of study:** The tool of observation is popular because of its simplicity & accuracy since in this method, researcher himself is active in collecting data, he can pursue generalization with greater conviction & can be sure about the results. It is more simple as compared to other methods. This is not to say that it is completely nontechnical. But if compared with other techniques of data collection, observation is less demanding.
- 2) It is possible to record behavior as it occurs.** Many other research techniques depend entirely on people's retrospective or anticipatory ability to report their own behavior. These reports are by & large given when the respondent is somewhat removed from stress & strains of the then situations. Therefore, the respondent can always put up a front or rationalize his behavior later.
- 3) Several aspects of human behavior are taken as part & parcel of a given individual's personality.** Such items of behaviour therefore escape a conscious detection & resist translation into words. Techniques of interview & questionnaire do not cover these subtle aspects.
- 4) Observation as a technique is independent of people's willingness to report.** Respondents sometimes have not time or are unwilling to be interviewed or tested. The tool of observation, comparatively speaking is less demanding of active cooperation on the part of the subjects & therefore can be widely used.
- 5) There are certain categories of respondents like animals, Infants, mentally disturbed people, etc.** Which cannot be studied with the help of interview or questionnaire. Respondents who are not capable of giving a verbal or written version of their experiences are best studied with the help of the technique of observation.

Types Of Observation: Discussion In Detail:-

The investigator, whatever be the purpose of his study, should answer four broad questions before setting out to observe:- a) What should be observed? b) How the observation should be recorded. c) How to ensure accuracy of observation. d) What kind of relationship should be obtained between the observers & observed. Depending on these answers, the investigator should choose upon the type of observation he would like to go for broadly speaking, observations are of following types:- a) Participant observation b) Non – participant observation. c) Controlled observation. d) Uncontrolled observation.

A) Participant Observation:-

In this method, the observer himself participates in the activities of the group which he is studying. Because of the participation of the observer this is known as participant observation. It is not necessary for the observer to identify himself with the group or actively take part in all the acts. But he has to be physically present

while the members of the group perform their activities. Generally, participant observation is kind of uncontrolled observation, in which the researcher may or may not reveal his identity.

This method allows observation of the individual's behavior in the most natural condition secondly, the researcher has access to a body of information which would not have been easily obtained by observer as an outsider. Researcher has the privilege of being part of the group. He gets to share the feelings, emotions & behavior of the group. He gets to share the feelings, emotions & behavior of the group members (subjects) & thus records it more accurately. He is able to see not only the actions or behavior of the people but is also able to know why & under what give situation subjects act or behave in a given manner. Because the context within which things occur is dearer indeed observation of this type is much more meaningful. Participant observation also allows the researcher to check the truth of statements made by the members of the group.

Participant observation though is an effective method of data collection, it has its own limitations with greater degree of participation, the observer is likely to develop close relationship with other members of the group. This can kill investigator's ability in the group to the extent that he may forget observe certain relevant aspects of human behavior. Affiliation with the group can also make the researcher bias or partial towards a particular subgroup therefore hampering scientific accuracy. In a participant observation, researcher is forced to occupy a particular position. This limits the scope of the observer to study the phenomenon fully moreover, if the researcher comes to occupy a strategic position in a group, he generally end up bringing about changes in group dynamics therefore bullying the purpose of data collection. Greatest difficulty in participant observation method is in recording the observed facts. If he records at the spot, he kills the neutrality of the situation. If he records later on, he may forget many things. If he is working in disguise, he has to be very careful about his own activities. Several sociologists & anthropologists have used this method to collect data. Merton's study of hobos, Serfaty's study of the psychology of social norms, Land's two surveys of middle town, John Dillard's studies in the southern states, Warner's & Hunt's study of Yankee city are some famous examples.

b) Non- Participant Observation:-

This method is characterized by a relative lack of the participation by the observer in the life of the group that he is observing. The researcher stands at a distance & observes the behavior of the group members often the observed persons are aware of the investigation going on. It is often used in small group research situation. A pure non-participant observation is difficult. There are no standard set of relationships or role patterns for the non member whose is always prevented but never participating.

In a non-participant observation observer maintains a purely impartial status. He is only a silent observer & thus is in a position to record each & every detail with bias. He can maintained a detached view & keep himself a loot from petty quarrels among the group. Similarly there is no fear of researcher influencing the behavior patens of the subjects in this method. Scope of this method is relatively wider because the observer is not expected to occupy any particular positioning the bier achy in order to observer phenomena like in a participant observation. He therefore gets to observe the whole group at a given point of time. Nevertheless, this type of observation also has its share of limitations. Being a non-participant observer the researcher involved observes only those activities that are visible or apparen. Since he has no opportunity to interact with the subjects he may fail to appreciate the significance of a particular event fully or psychology of the individual involved. Because of the lack of complete context, in correct or even biased inter predation may occur. People generally feel more suspicious of a person who stands at a distance as a supervisor than a person who intermingles with them as an associate. The whole group may either feel uncomfortable or too conscious to behave in a normal manner when under observation. In this method, researcher may collect all sort of data & all visible facts, thinking it is important. The potential to discern between important & unimportant or relevant & irrelevant is not present on the part of a researcher because of his restricted role as the observer.

On the whole, a non-participant type of observation is quite popular in social science. Roe this Berger & Dickson functioned on passive members of work groups within an industrial plant for their study on „Management & the works“ Warner & Lunt suggested using this method. E.g. – sacred & secular rituals, factories, retail ships, etc. Nevertheless, it is important to note that in social sciences there is no pure participant or pure non-participant observation. Because both participant observation & non-participant observation suffer from limitations. Good & Hatt opt for a third approach, namely quasi participant observation. This is used in certain situations.

According to this approach, the observer takes part in many activities of the group so as to avoid the awkwardness of complete non-participation, while taking on the role of observer or interviewer for others. This pattern was followed by be play in the working class families & by Lynds in their study of Middletown.

c) Controlled Observation:-

When the process of observation occurs under guided conditions, it is called controlled observations. The rain purpose of these types of observation is to check any bias due to faulty perception, in accurate data & influence of outside factors on a particular incident. Control exercised in this type of observation is of two types:-

- a) Control over the phenomena.
- b) Control over the observation

a) Control over the phenomena is exercised by putting the phenomenon to laboratory type of test. Generally third type of test is very difficult in case of social phenomena but attempts have been made in this direction such experiment have been particularly tried in case of the study of behavior of children & infants. Subjects are kept in a room where various kinds of stimuli are provided & reaction of subjects to there stimuli is observed. Famous experiment of this type is the Hawthorne experiment that was conducted to study a correlation between work conditions & productivity levels of workers.

b) Control over the observation is exercised when it is impossible to obtain control over the phenomenon. The main purpose is to control & guide researcher"s perception about the experiment in order to do away with faulty approach or bias. Following kinds of control devise are generally used for this type of observation.

- 1) Detailed observation plan.
- 2) Use of schedules.
- 3) Use of mechanical appliances.
- 4) Use of socio metric scales.
- 5) Use of hypothesis.
- 6) Team observations.
- 7) Use of control groups.

Though this tool of controlled observation is quite scientifically planned & therefore yields objective result if administered correctly it"s scope is limited. Not all phenomena"s render them selves to controlled observation. Several ethical considerations also are important in this context. According to some experts, it is incurred to manipulate human behavior solely for research purpose.

d) Uncontrolled Observation :-

When observation takes place in natural surrounding"s & activities are performed in their usual course without any influence or guidance from any external force it is known as uncontrolled observation. Thus in this case, the observer visits the place of occurrence of phenomenon in order to observe he does not take part in any of the activities. Most of the social phenomena are observed & studied in this fashion. Scope of this method is certainly wider. Most of the social situations cannot be put through a laboratory type of study. Moreover, the best result regarding social & cultural setting. E.g. Study of folklores, customs, slum conditions, etc. Some social researchers have criticised the method of uncontrolled observation. Many feel that uncontrolled observation is very unreliable. Researcher can generalize on the basis of stray incidents without verifying them. Various

servers may observe the same thing differently & draw different conclusions. To conclude, observation is one of the imp. methods of data collection. It's utility cannot be undetermined due to any of the other methods of data collection.

Limitations Of Observation :-

1) As mentioned earlier, observation has to be carefully recorded by the researcher. It is often impossible to anticipate the occurrence of an event precisely enough to be able to be present to observe it. Moreover, the observer has to be mentally prepared interfering with the observational task.

2) The technique of observation cannot be utilized in certain cases because of the duration of events, e.g. – life histories, evolution of an institution, etc. Therefore the efficacy of this technique is limited.

3) Certain personal event do not lend themselves to the technique of observation. Private behavior, sexual behavior, family conflicts cannot be studies with the help of the technique of observation.

4) All researchers can't be, good observers. Being human, an observer cannot be completely objective in a situation observation is a difficult technique The researcher, to be a good observer should be thoroughly conversant with the problem

under investigation should be properly trained & should be able to detach himself from the situation in order to record it scientifically. 5) All the events are not observable. In several cases facts are naturally in places & time facts have to be put together in order to make things/events meaning full. It is not possible to do it effectively with the help of the technique of observation.

SUMMARY:-

The technique of observation stands for a systematic viewing coupled with the consideration of the seen phenomenon. This technique includes a stages of sensation attention & perception in it there are four types of observation in scientific research : Participant observation where the researcher actively participates in the functioning of the group under study, non-participant observation; where the researcher acts like a silent observer, controlled observation; where the researcher tries to control either the phenomenon or the method of observation & uncontrolled observation where the researcher merely observation the functioning the group without playing any significant role in it observation is considered to be one of the best methods of data collection.

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QUESTIONS :-

- 1) What do you mean by observation? Discuss its types.
- 2) Explain ethnography.
- 3) Discuss participant and non-participant observation.

INTERVIEW AND INTERVIEW SCHEDULE

Introduction and Meaning

Social Research has one fundamental advantage over physical research in the sense that the researcher can talk to his subject to know his feeling and reactions. He need not very entirely on his own senses and perceptions as in the technique of observation but can take active help from the subject also. This fundamental advantage is put to its fullest use in case of interview.

DEFINITION

“Interview consists of dialogue on verbal responses between two persons on between several persons. (Lindman) “Interview is a technique of field work which is used to watch the behaviour of individuals to second statements, to observe the concrete results of social on group interaction. (Pauline Young) According to Young, therefore interview may be regarded as a systematic method by which a person enters more or less imaginatively into the life of a comparative stranger. It is move like a tape recorder in which past incidences, feelings and reactions of the subjects and played back to the living present to be listened to by the interview with a scientific approach.

PURPOSE OF INTERVIEW:

The purpose of this technique of data collection is two fold:-

- a) To secure certain information from the subject, which is known only to himself and cannot be gathered from any other source.
- b) To study scientifically the verbal behaviour of the subject under given circumstances. For the first purpose the interviewer tells the topic to the subject and the subject narrates his feeling and reactions pertaining to it.

The interviewer listens to these narratives and tries to find how far they fit in the hypothesis framed by him. For the second purpose the interest of the researcher is more centered in the attitude and expressions of the subject than the actual facts. Hence in this case the researcher acts more like a social psychologist

than as a sociologist. His attention is more focussed at the reactions and the changes in the moods and gestures of the subject which he is narrating a particular incident. Both these purposes generally go hand in hand in any social research.

As Lundberg rightly remarks "The researcher is interested in the objective data secured from the interview such as income no. of children their ages etc. and also in the personality of the informant – his attitude, prejudices, likes and dislikes as revealed by his verbal behaviour including the subtle gestures that accompany it, such as facial expression, tone and voice and so forth" Special emphasis may, however be given to any of the aspects. In a Social interview nonverbal communication is generally observed as an aid to judge the validity of the statements of the subject.

TYPES OF INTERVIEW

Different types of interviews have been classified differently by different people. Classifications are done on the basis of various criteria.

1) Some of the important classifications are –

a) Individual interview – i.e. One interview with one interviewee

b) Group interview – i.e. One interviewer with many interviewee on panel of interviewers with group of interviewee.

2) Classification on the basis of information gathered a) Intensive interview. b) Simple interview.

3) Sometimes interviews can be classified on the basis of the functions they perform/purpose they serve. a) Diagnostic interviews. b) Psychiatric interviews c) Recruitment interviews.

4) But whatever the typology broadly speaking there are five types of interviews as given by Pauline Young.

a) Structured interviews :- These are also called controlled guided or direct interviews. These interviews involve a set of predetermined question format which is strictly followed. Structural interviews mostly involve the use of fixed, close-ended questions. Sequence of questions, language used is also not changed by the interviewer. The interviewer only has the liberty to further explain the question or repeat the question if the subject has not understood it.

b) Un structured interviews :- These are also called uncontrolled, unguided or non-direct interviews. There is not predetermined question format in this type of interview. The researcher is given certain broad topics upon which the information is to be collected it is held in the form of free discussions. This kind of interview is characterized by a far too greater flexibility of approach to questioning the respondents. Respondents are encouraged to relate freely their experiences. Such interviews permit a free flowing account of the personal and social contexts of beliefs and feelings. The interviewer involved is allowed much greater freedom to ask supplementary questions to change the sequence of questions or even offer explanations and classifications.

c) Focussed interview :-

These interviews are of semi standardized type Main purpose is to focus attention of the given experience of the respondent and its effect. The interviewer knows in advance the relevant aspects of the issue he has to cover. He has more or less a complete freedom to decide the manner and the sequence in which the questions should be asked. The interviewer has complete freedom to explore reasons and motives, to probe further etc. In such interviews, although the respondent is free to express completely his own line of thoughts. The direction of the interview is mainly in the hands of the interviewer. The focussed interviews have been used effectively in the development of hypothesis. The researcher tries to focus respondents attention the particular aspects of the problems and tries to know his experiences, attitudes, emotion and responses regarding the concrete under study.

d) Depth interviews : This type of interviews are also semistandardize in nature. Depth interviews are often mistaken for focused interviews. Where the purpose of focused interviews is to focus attention on a particular phenomenon or a situation and to collect all possible information concerning it. Depth. interviews has a purpose of going deep into a person life to find out his motives, ideas opinion and attitudes for this type of interview the researcher has to be skilled and trained. He enjoys the freedom of altering the question and further explaining them or changing the order of it. This type of interview is often used in studying psychiatric problems.

e) Repeated interviews :- Interviews are repeated when these are utilized to note that gradual influence of some social or psychological process. When the process is long-term and of evolutionary nature the data is collected in a chronological manner when repeat interviews serve the purpose. Repeat interviews are generally a very costly affair. A prolonged second has to be maintained to study the change in a continue sequence. Generally a permanent organisation is set up for the purpose. To make such a process successful, the number of cases under the study has to be limited. The cases must also be localised in particular place. To conclude, though this typology is valued in social research it should be mentioned here that these types should not be looked at as watertight compartments. These are cross-classifications and thus one used in combination several times.

INTERVIEW TECHNIQUE:

As good and flat put it, interviewing is fundamentally a process of social interaction its primary purpose may be research but this is its purposes for the investigator for the respondent. Its foundation and meaning may differ. Whatever the purpose the fact remains that the process of interviewing is basically a process of social inter action.

This process in the technique of interview is further complicated by the fact that the interview also has sight the interviewer and interviewee both human beings implies that the interviewer most not only attempt to conscious of the real meaning off the answer given by the interviewee but he must also be aware on the fact of their respondent is turn in turn guessing at the movies of the interviewer reacting basically not the interviewer but to the image that he has given of him.

Preparation stage : Since the interviewer plays a keyrole in this process, he must interview be keen and alert to what he is bringing to the interview situation. It is appearance, his facial and manual gestures, his information, his fears and anxieties, his knowledges and cleverness. All these affects the interviewee. Thus the interviewer involved has to be experienced and skilled. Once the interviewer receives a list of specific respondents whom be must interview personally, the very first task of his to contact them either on phone or through any other channel and fix up an appointment along with other details. The interviewer must identify

himself and his institution and also the purpose of the interview must be discussed beforehand if possible. Sometimes, interviewee first contact is not with the interviewee but with a member of the family, friend or assistant. In such cases, the interviewer must also respect and understand these people because these are the members who influence the decision of the interviewee.

BEGINNING OF THE INTERVIEW AND RAPPORT BUILDING: The interview is not simply a conversation, it is rather a pseudo conversation. In order to be successful, it must have all the warmth and affection, mutual confidence and respect with the clarity and guidelines of scientific research. The interviewer must introduce himself as though beginning a conversation in a friendly manner but the additional element of professional competences should be always be maintained. Same type of conversational statement is after useful in establishing friendly relations with the respondent. A simple statement that conveys the idea that the interviewer is not superior person, but a professional doing his job may help to start the interview on a warm basis.

Rapport building is one of the important requirements in this process. A state of rapport exists between the interviewer and respondent when the latter has accepted the research goals of the interviewer and actively seeks to help him in obtaining necessary information. The interviewer must convince the interviewee of the authenticity and

reliability of the research and secrecy and confidentiality of the information as he imports.

CARRYING THE INTERVIEW FORWARD: The process of continuing the interview varies depending upon the type of interview “carrying the interview forward” has different meanings in diff. types of interviews. This process of carrying the interview forward is greatly helped writing the questions in a fashion which most closely approximates a conversation. The interviewer must be ready not with the lost of exact questions but questions draft or possible topics on which he would like to dwell upon. Certain introductory comments or appropriate transitional phrases help to build rapport. Once the informal environment has been created the silence or gaps that occur in between need no longer be filled quickly by hurried question.

The answer to the silence may sometime nearly an interested look or sympathetic half smile to indicate that the comment is being digested. While continuing the interview; the interviewer must avoid the temptation to express his own views, even if given the opportunity. Nevertheless, the interviewer cannot be efficient if he tries to by obey a passive listener. He must be critical and intelligent listener.

Probe Question Stage : The most significant or crucial questions in the schedule must be presented with great care. Sometimes answer given do not provide with satisfactory information such situations requires further questioning attempt to „probe more deeply into the meaning of the response given. There are various types of probe :- 1) First type of probe is required where the subject has failed to answer the questions concretely. 2) Second type of probe is required where the interviewee is not able to answer the xperquestions. When the respondent simply does not have the information, of course the probe will be of no use. But studies say that the respondent gives a „don't known answer because he is unable to think of the answer immediately or is afraid to attempt an answer or ha not understood the question. In all such cases, weapon of probe question serves the purpose.

3) Third type of probe is called „Antagonistic probe Though creating a friendly atmosphere while interviewing is necessity for better results; it is not the basic purpose. In situations where the respondent is found to be giving false information, antagonistic probe is the weapon that the interviewer must use. This weapons takes many forms. Sometimes this may take form of „why question or phrases like „That's very interesting or just a gesture to indicate that you want to hear something more about it.

Recording the Interview :- Increasingly now social research is a group research and the interview and tabularator are two persons. Then the work of recording the interview becomes important. Additional bits of information from the interviewer helps the experts to drive at a complete picture of the phenomenon under study. So far as possible the exact words of the respondent should be recorded. They should not be edited for grammar or meaning. Such Things indicated the ethics or culture of the subject. As an additional aid to complete reporting, the interviewer may taken

it a practice to go directly from the interview to a computer or a typewriter or desk in order to write out the details while the information is still fresh in his mind. Delay of any proportion may quickly distort or blur the details.

Closing the interviews :- In this techniques of social research because of face to face interaction with the respondent the researcher very often gets involved in a situation or in the intensive interview, if fairly deep and troubled matters are touched upon, the respondent may feel grateful and may be unwilling to let the interviewer leave. In such situations, the common experience for the interviewer is to find dosing of interview more difficult than the opening. For the usual type of interview; a simple „Thank You Very Much“ with a friendly smile is an adequate good-bye. However in qualitative interview, the interviewer must select his occasion of departure more carefully. The departure should not be abrupt though it can be deliberate and open. It is important to communicate to the respondent that the interviewer is happy and satisfied with his co-operation. This stage should always be accompanied by an expression of the tanks in recognition of respondent's generosity in time and attention

CRITICAL EVALUATION OF THE INTERVIEW

Interview as a technique of social research is quite popular. It is used extensively in different types of surveys.

Advantages of interviews :-

- 1) It is a face to face interaction between the researcher and the respondent. Because the data collection in this process is directly based upon respondent's narration, it is possible for a researcher to collect primary information successfully. Primary information is is more or less reliable.
- 2) Data collection through this technique is based upon verbal (words and phrases) as well as non-verbal (gestures, facial expression, body language etc) indicators. Since it is based on a combination of facts, data are more scientific and accurate.
- 3) Scope of the technique of interview is quite wide. It is quite wide. It is only through this technique that the events that are not open to observation can be studied and analysed. E.g. Family problems, Abstract factors like attitudes,

feelings, emotions, perceptions can also be studied with the help of the technique of interview.

LIMITATIONS OF INTERVIEWS

- 1) In the technique of observation, the researcher notes down what he gets to study. Therefore, he records things as they are on the other hand in the technique of interview, interviewee is more or less removed from the situation he talking about. Therefore, there is a total reliance on his memory. He narrates what he recalls. Moreover, he narrates what he chooses to recall. An interviewee can put up a front or offer justification
- 2) Scope of the technique of interview is limited. Because this technique demands active assistance on the part of the respondent situations where respondent is unwilling to cooperate or is too busy do not cater to the technique of interview.
- 3) There is a lot subjectively involved in the process of interviewing. The researcher there fore has to be skilled and experience. Only a trained researcher can carry out this process of interviewing successfully.

About Interview as mentioned in Wikipedia, the free encyclopedia of internet

An interview is a conversation between two or more people where [questions](#) are asked by the interviewer to elicit facts or statements from the interviewee. Interviews are a standard part of [journalism](#) and [media](#) reporting, but are also employed in many other situations, including [qualitative research](#).

Interviews in journalism

In [journalism](#), interviews are one of the most important methods used to collect information, and present views to readers, listeners or viewers.

Interview as a method for qualitative research

The [qualitative research](#) interview seeks to describe and the meanings of central themes in the life world of the subjects. The main task in interviewing is to understand the meaning of what the interviewees say.

Interviewing, when considered as a method for conducting qualitative research, is a technique used to understand the experiences of others. Interviewing as qualitative research: A guide for researchers in education and the social sciences.

Characteristics of qualitative research interviews(in Wikipedia, the free encyclopedia)

1. Interviews are completed by the interviewer based on what the interviewee says.
2. Interviews are a far more personal form of research than questionnaires.
3. In the personal interview, the interviewer works directly with the interviewee.
4. Unlike with mail surveys, the interviewer has the opportunity to probe or ask follow up questions.
5. Interviews are generally easier for the interviewee, especially if what is sought are opinions and/or impressions.
6. Interviews are time consuming and they are resource intensive.
7. The interviewer is considered a part of the measurement instrument and interviewer has to be well trained in how to respond to any contingency.
8. Interview provide an opportunity of face to face interaction between two persons;hence it reduces conflicts

Technique Journalists interviewing [acosplayer](#), When choosing to interview as a method for conducting qualitative research, it is important to be tactful and sensitive in your approach. Interviewer and researcher, Irving Seidman, devotes an entire chapter of his book, Interviewing as Qualitative Research, to the import of proper interviewing technique and interviewer etiquette. Some of the fundamentals of his technique are summarized below:

Listening: According to Seidman, this is both the hardest as well as the most important skill in interviewing. Furthermore, interviewers must be prepared to listen on three different levels: they must listen to what the participant is actually saying, they must listen to the “inner voice” or subtext of what the participant is communicating, and they must also listen to the process and flow of the interview so as to remain aware of how tired or bored the participant is as well as logistics such as how much time has already passed and how many questions still remain. The listening skills required in an interview require more focus and attention to detail than what is typical in normal conversation. Therefore it is often

helpful for interviewers to take notes while the participant responds to questions or to tape-record the interviews themselves so as to be able to more accurately transcribe them later.

Ask questions (to follow up and to clarify): While an interviewer generally enters each interview with a predetermined, standardized set of questions, it is important that they also ask follow-up questions throughout the process. Such questions might encourage a participant to elaborate upon something poignant that they've shared and are important in acquiring a more comprehensive understanding of the subject matter. Additionally, it is important that an interviewer ask clarifying questions when they are confused. If the narrative, details, or chronology of a participant's responses become unclear, it is often appropriate for the interviewer to ask them to re-explain these aspects of their story so as to keep their transcriptions accurate.

Be respectful of boundaries: Seidman explains this tactic as "Explore, don't probe," It is essential that while the participant is being interviewed they are being encouraged to explore their experiences in a manner that is sensitive and respectful. They should not be "probed" in such a way that makes them feel uncomfortable or like a specimen in lab. If too much time is spent dwelling on minute details or if too many follow-up questions are asked, it is possible that the participant will become defensive or unwilling to share. Thus, it is the interviewer's job to strike a balance between ambiguity and specificity in their question asking.

Be wary of leading questions: Leading questions are questions which suggest or imply an answer. While they are often asked innocently they run the risk of altering the validity of the responses obtained as they discourage participants from using their own language to express their sentiments. Thus it is preferable that interviewers ask open-ended questions instead. For example, instead of asking "Did the experience make you feel sad?" - which is leading in nature - it would be better to ask "How did the experience make you feel" - as this suggests no expectation.

Don't interrupt: Participants should feel comfortable and respected throughout the entire interview - thus interviewers should avoid interrupting participants whenever possible. While participants may digress in their responses and while the interviewer may lose interest in what they are saying at one point or another it is critical that they be tactful in their efforts to keep the participant on track and to return to the subject matter in question.

Make the participant feel comfortable: Interviewing proposes an unusual dynamic in that it often requires the participant to divulge personal or emotional information in the presence of a complete stranger. Thus, many interviewers find it helpful to ask the participant to address them as if they were "someone else," such as a close friend or family member. This is often an effective method for tuning into the aforementioned "inner voice" of the participant and breaking down the more presentational barriers of the guarded "outer voice" which often prevails.

Strengths and Weaknesses

There are many methods. When considering what type of qualitative research method to use, Qualitative Interviewing has many advantages. Possibly the greatest advantage of Qualitative Interviewing is the depth of detail from the interviewee. Interviewing participants can paint a picture of what happened in a specific event, tell us their perspective of such event, as well as give other social cues. Social cues, such as voice, intonation, body language etc. of the interviewee can give the interviewer a lot of extra information that can be added to the verbal answer of the interviewee on a question. This level of detailed description, whether it be verbal or nonverbal, can show an otherwise hidden interrelatedness between emotions, people, objects unlike many quantitative methods of research.

In addition, Qualitative Interviewing has a unique advantage in its specific form. Researchers can tailor the questions they ask to the respondent in order to get rich, full stories and the information they need for their project. They can make it clear to the respondent when they need more examples or explanations. Not only can researchers also learn about specific events, they can also gain insight into people's interior experiences, specifically how people perceive and how they

interpreted their perceptions. How events affected their thoughts and feelings. In this, researchers can understand the process of an event instead of what just happened and how they reacted to it.

Another advantage of Qualitative interviewing is what it can give to the readers of academic journals and papers. Research can write a clearer report to their readers, giving them a “fuller understanding of the experiences of our respondents and a greater chance to identify with the respondent, if only briefly.”

Now Qualitative Interviewing is not a perfect method for all types of research. It does have its disadvantages. First, there can be complications with the planning of the interview. Not only is recruiting people for interviews hard, due to the typically personal nature of the interview, planning where to meet them and when can be difficult. Participants can cancel or change the meeting place at the last minute. During the actual interview, a possible weakness is missing some information. This can arise from the immense multitasking that the interviewer must do. Not only do they have to make the respondent feel very comfortable, they have to keep as much eye contact as possible, write down as much as they can, and think of follow up questions. After the interview, the process of coding begins and with this comes its own set of disadvantages. First, coding can be extremely time consuming. This process typically requires multiple people, which can also become expensive. Second, the nature of qualitative research itself, doesn't lend itself very well to quantitative analysis. Some researchers report more missing data in interview research than survey research, therefore it can be difficult to compare populations How it feels to be a participant in qualitative research interviews

Compared to something like a written survey, interviews allow for a significantly higher degree of intimacy, with participants often revealing personal information to their interviewers in a real-time, face-to-face setting. As such, this technique can evoke an array of significant feelings and experiences within those being interviewed.

On the positive end, interviewing can provide participants with an outlet to express themselves. Since the job of interviewers is to learn, not to treat or counsel, they do not offer participants any advice, but nonetheless, telling an attentive

listener about concerns and cares can be pleasing. As qualitative researcher Robert S. Weiss puts it, "To talk to someone who listens, and listens closely, can be valuable, because one's own experience, through the process of being voiced and shared, is validated." Such validation, however, can have a downside if a participant feels let down upon termination of the interview relationship, for, unlike with figures like therapists or counselors, interviewers do not take a measure of ongoing responsibility for the participant, and their relationship is not continuous. To minimize the potential for this disappointment, researchers should tell participants how many interviews they will be conducting in advance, and also provide them with some type of closure, such as a research summary or a copy of the project publication.

On the negative end, the multiple-question based nature of interviews can lead participants to feel uncomfortable and intruded upon if an interviewer encroaches on territory that they feel is too personal or private. To avoid crossing this line, researchers should attempt to distinguish between public information and private information, and only delve deeper into private information after trying to gauge a participant's comfort level in discussing it.

Furthermore, the comparatively intimate nature of interviews can make participants feel vulnerable to harm or exploitation. This can be especially true for situations in which a superior interviews a subordinate, like when teacher interviews his or her student. In these situations, participants may be fearful of providing a "wrong answer," or saying something that could potentially get them into trouble and reflect on them negatively. However, all interview relationships, not just explicitly superior-subordinate ones, are marked by some degree of inequality, as interviewers and participants want and receive different things from the technique. Thus, researchers should always be concerned with the potential for participant feelings of vulnerability, especially in situations where personal information is revealed.

In order to combat such feelings of vulnerability and inequity and to make participants feel safe, equal, and respected, researchers should provide them with information about the study, such as who is running it and what potential risks it

might entail, and also with information about their rights, such as the right to review interview materials and withdraw from the process at any time. It is especially important that researchers always emphasize the voluntary nature of participating in a study so that the participants remain aware of their agency.

These aforementioned power dynamics present in interviews can also have specific effects on different social groups according to racial background, gender, age, and class. Race, for example, can pose issues in an interview setting if participants of a marginalized racial background are interviewed by white researchers, in which case the existence of historical and societal prejudices can evoke a sense of skepticism and distrust. Gender dynamics can similarly affect feelings, with men sometimes acting overbearingly when interviewing women and acting dismissively when being interviewed by women, and same-gendered pairs being vulnerable to false assumptions of commonality or a sense of implicit competition. In terms of class, participants of perceived lower status demonstrate, in some cases, either excessive skepticism or excessive submissiveness, and in terms of age, children and seniors may exhibit fears of being patronized. In order to minimize these social group related negative feelings, researchers should remain sensitive to possible sources of such tensions, and act accordingly by emphasizing good manners, respect, and a genuine interest in the participant, all of which can all help bridge social barriers.

Finally, another aspect of interviews that can affect how a participant feels is how the interviewer expresses his or her own feelings, for interviewers can project their moods and emotions onto those they are interviewing. For instance, if an interviewer feels noticeably uncomfortable, the participant may begin to share this discomfort,[\[9\]](#) and if an interviewer expresses anger, he or she is in danger of passing it on to the participant. So, researchers should try to remain calm, polite, and interested at all times.

Types of interviews(in Wikipedia, the free encyclopedia)**Informal, conversational interview**

No predetermined questions are asked, in order to remain as open and adaptable as possible to the interviewee's nature and priorities; during the interview the interviewer "goes with the flow".

General interview guide approach

Intended to ensure that the same general areas of information are collected from each interviewee; this provides more focus than the conversational approach, but still allows a degree of freedom and adaptability in getting the information from the interviewee.

Standardized, open-ended interview

The same open-ended questions are asked to all interviewees; this approach facilitates faster interviews that can be more easily analyzed and compared.

Closed, fixed-response interview

All interviewees are asked the same questions and asked to choose answers from among the same set of alternatives. This format is useful for those not practiced in interviewing. This type of interview is also referred to as structured.

Interviewer's judgements

According to Hackman and Oldman several factors can bias an interviewer's judgment about a job applicant. However these factors can be reduced or minimized by training interviews to recognize them.

Some examples are:

Prior Information

Interviewers generally have some prior information about job candidates, such as recruiter evaluations, application blanks, online screening results, or the results of psychological tests. This can cause the interviewer to have a favorable or unfavorable attitude toward an applicant before meeting them.

The Contrast Effect

How the interviewers evaluate a particular applicant may depend on their standards of comparison, that is, the characteristics of the applicants they interviewed previously.

Interviewers' Prejudices

This can be done when the interviewers' judgement is their personal likes and dislikes. These may include but are not limited to racial and ethnic background, applicants who display certain qualities or traits and refuse to consider their abilities or characteristics.

SUMMARY OF INTERVIEW

Interview consists of a dialogue between two or more persons. The fundamental advantage of this technique is that the researcher can actually interact with the subject on slides under consideration. Generally speaking, there are 5 types of interviews in social research. Structured interviews, Unstructured interviews, Focused interview, Depth interviews, Repeat interviews. Because interview is a process of interaction, interviewing goes through various stages like preparation stage, rapport building stage, carrying the interview forward, probe questioning, recording the interview, closing the interview. In spite of the limitations of the technique, closing the interviews, interview is said to be the best technique of data collection.

CHECK YOUR PROGRESS:

- 1) Discuss meaning of questionnaire.
- 2) Analyze objectives of questionnaire.
- 3) What are the advantages of questionnaire ?
- 4) Explain disadvantages of questionnaire
- 5) What are the techniques to conduct questionnaire explain.
- 6) What do you mean by interview ?
- 7) Analyse unstructured interview.
- 8) Highlight focus interview.
- 9) Explain Interview technique.

QUESTIONS :-

1. State the important classifications of interviews and discuss in detail Pauline Young's typology of interview.
2. Write a note in the Technique of Interview with reference to various stages involved in the process of interviewing.
3. Critically evaluate the potential of interview as a technique of data collection.
4. "Interview is the best tool of data collection". Comment.

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QUESTIONNAIRE

Introduction and Meaning

Questionnaire is one of the important tools of data collection. It is defined as “A list of questions given to a human of persons for them to answer. It secures standardized result that can be tabulated and tested statistically. (Bogandus – Sociology) “A questionnaire refers to a device for securing answers to questions by using a form which the respondent fills in himself. (Goode Half-Methods of social Research) Questionnaire is a set of questions. Generally it is mailed to the respondents of collecting data. It is employed when the area of study is wide and the subjects are widely dispersed. In this method the researcher does not collect the data by himself. He relies on the information provided by the respondents.

Objectives And Types Of Questionnaire

There are two basic objectives of Questionnaire :

- 1) To collect information from the respondents who are scattered in wide area.
- 2) To achieve success in collecting reliable and dependable information.

Types of Questionnaire :

a) Structured Questionnaire :- This questionnaire is named before the study is started and it is not possible to change it offer beginning the study.

b) Non Structured Questionnaire :- This kind of Questionnaire is used more like a guide. It consists of definite subject matter areas, the coverage of which is required during the process of data collection. It is generally used in the technique of interview in which case it is called an interview schedule. Questionnaire is also divided on the basis of nature of the questions that it contains. They are:

1. closed,
2. open,
3. pictorial and
4. mixed.

1. Closed questionnaire usually contains itemized answers to the questions being asked various alternatives to the real answer are also given. The respondent is only to select the answer and put it down.

2. Open Questionnaire is just the reverse of the closed questionnaire. It is used in the cases where new facts are to be found out. The respondent is given the liberty to express his views freely.

3. Pictorial questionnaire is similar to closed types of questionnaire. Generally it is use for children of small age group on illiterates on person with lower. I.Q. Along with the questions, pictures showing the meanings of those questions one given. The respondent is required to give out the answers on the basis of pictures.

4. Mixed questionnaire is neither completely closed non open. It consist of both the type of questions. Since it is combination of the types of the questions it is popular in social research.

ADVANTAGES OF QUESTIONNAIRE :-

Questionnaires are very cost effective when compared to face interviews. This is especially true for studies involving large sample size and large geographic areas. Written questionnaire become even more cost effective as the number of research questionnaire increases. Questionnaires are easy to analyze. Data entry and tabulation for nearly all surveys can be easily done with many computer software packages.

Questionnaires are familiar to most people. Nearly everyone has had some experience completing questionnaires and they generally do not make people apprehensive. Questionnaires reduce bias. There is uniform question presentation and no middleman bias. The researcher's own opinion will not influence the respondent to answer questions in a certain manner. There are nor verbal on visual clues to influences the respondent. Questionnaires are less intrusive than telephone on face-to-face surveys. When a respondent receives a questionnaire in the mail, he is free to complete the questionnaire on his own time-table. Unlike other research methods, the respondent is not interrupted by the research instrument.

DISADVANTAGES OF QUESTIONNAIRE :-

One major disadvantage of written questionnaire is the possibility of low response rates. Low response is the curse of statistical analysis. It can dramatically lower own confidence in the results. Response rates vary widely from one questionnaire to another (10%-10%), however, well-designed studies consistently produce high response rates. Another disadvantage of questionnaire is the inability to probe responses, Questionnaires are structured instruments. They allow little flexibility to the respondent with respect to response format. In essence, they offer lose the “Flavor of the response (i.e. : respondents often want to qualify their answers). By allowing frequent space for comments, the researcher can partially overcome this disadvantage. Comments are among the most helpful of all the information on the questionnaire, and they usually provide insightful information that would have otherwise been lost. Nearly ninety percent of all communication is visual. Gestures and other visual cues are not available with written questionnaires. The lack of personal contact with have different effects depending on the type of information being requested. A questionnaire requesting factual information will probably not be affected by the lack of personal contact. A questionnaire probing sensitive issues on attitudes may be severely affected.

When returned questionnaire arrive in the mail, it’s natural to assume that the respondent is the same person you sent the questionnaire to. This may not actually be the case. Many times business questionnaires get handed to other employees for completion. Housewives sometimes respond for their husbands. Kids respond as a prank. For a variety internet in questionnaires.

Finally, questionnaires are simply not suited for some people. For example, a written survey to a group of poorly educated people might not work because of needing skill problems. Non frequently, people are turns off by written questionnaires because of misuse.

TECHNIQUE OF CONSTRUCTING A QUESTIONNAIRE

In case, the study is to be conducted through questionnaire method, the questionnaire has to be drawn up in a scientific manner. The framer of

questionnaire should keep certain things in view while constructing this device. In this method the respondent gives his answers from a distance. The language and the wordings of the questions should be stimulating to the respondents to give replies. The psychology of the respondent should be kept in mind and the questionnaire should be framed keeping in view the factors that are likely to encourage him to give correct answers.

1) Number of questions :- A questionnaire should contain a large number of questions. If there are too many questions, generally respondents lose interest and start giving irrelevant answers. Thus a questionnaire should neither be too long nor too brief.

2) Questions should be unambiguous, clean and simple :-

Double barreled questions should not be used. One should not include two or more questions in one. (e.g. Does your department have a special recruitment policy for racial minorities and women). Such a question typically leads to hesitation and indecision on the part of the respondent. Some questions are themselves vague and ambiguous. Themes such as social integration for example, may not be well known to the respondents. The meaning of some questions may be known only to highly educated respondents. Slang or colloquial phrases may be known only to one group, or may have different meanings to different groups. Such differences can present a real communication problem if the group of respondents is not homogeneous. After resolving to avoid ambiguous wordings is appropriate. This very often depends upon the educational level of the respondents. Many researchers feel that they should phrase their questions in the respondents' everyday slang so as to maximize rapport between respondent and researcher. This is perhaps on those matters for which there is no right or wrong choice. Moreover the questions should refer to concrete and specific matters like age or sex are specific but opinion questions are especially difficult. The respondent often does not have an option because he or she has never thought about the topic. He or she is concerned about appearing stupid and must be reassured that there is no right or wrong answer.

3) Leading questions :- Questions should be carefully structured in order to minimize the probability of biasing the respondents answer by leading him or her and thus artificially increasing the probability of a particular response. The researchers task is to avoid leading questions as far as possible or to use neutral wordings instead.

4) Technical and special words should be clearly explained :- While using technical jargon the researcher needs to provide an adequate explanation to all the words so as to enable the respondent to understand it in a correct way.

5) Personal questions :- Very personal questions should be avoided. Respondents are generally unwilling to write down such information. Personal questions should be asked only if completely required. Besides these considerations certain technical considerations should be kept in mind like –

- a) Quality of paper used.
- b) Response category format.
- c) Mailing facilities etc.
- d) Layout of a questionnaire

When technique of questionnaire is used in scientific surveys and when the sample size is big ; it is always advisable to attach a Covering letter to the questionnaire. A good covering letter includes the following.

- 1) A brief introduction of a researcher/researchers and basic information about the institution involved in the process of research.
- 2) Statement regarding the purpose of survey undertaken.
- 3) Enclose a self-addressed envelope for the respondents convenience in returning the questionnaire.
- 4) Assure the respondent that the information he gives will be kept confidential. 5) Promise the respondent that he will be contacted after he fills up questionnaire.
- 6) If the respondent is interested, promise a copy of the results of the survey to him.
- 7) If possible and if required offer social incentives to the respondents on the return of the questionnaire.

About Questionnaire as mentioned in Wikipedia, the free encyclopedia on net

A questionnaire is a [research](#) instrument consisting of a series of [questions](#) and other prompts for the purpose of gathering information from respondents. Although they are often designed for [statistical](#) analysis of the responses, this is not always the case. The questionnaire was invented by [Sir Francis Galton](#).[\[citation needed\]](#)

Questionnaires have advantages over some other types of [surveys](#) in that they are cheap, do not require as much effort from the questioner as verbal or telephone surveys, and often have standardized answers that make it simple to compile data. However, such standardized answers may frustrate users. Questionnaires are also sharply limited by the fact that respondents must be able to read the questions and respond to them. Thus, for some demographic groups conducting a survey by questionnaire may not be practical.

As a type of survey, questionnaires also have many of the same problems relating to question construction and wording that exist in other types of [opinion polls](#).

Types

A distinction can be made between questionnaires with questions that measure separate variables, and questionnaires with questions that are aggregated into either a scale or index. Questionnaires within the former category are commonly part of surveys, whereas questionnaires in the latter category are commonly part of tests.

Questionnaires with questions that measure separate variables, could for instance include questions on:

preferences (e.g. political party)

behaviors (e.g. food consumption)

facts (e.g. gender)

Questionnaires with questions that are aggregated into either a scale or index, include for instance questions that measure:

latent traits (e.g. personality traits such as extroversion)

attitudes (e.g. towards immigration)

an index (e.g. Social Economic Status)

Examples

A food frequency questionnaire (FFQ) is a questionnaire to assess the type of diet consumed in people, and may be used as a research instrument. Examples of usages include assessment of intake of vitamins or toxins such as [acrylamide](#).

Questionnaire construction**Question types:**

Usually, a questionnaire consists of a number of questions that the respondent has to answer in a set format. A distinction is made between open-ended and closed-ended questions. An open-ended question asks the respondent to formulate his own answer, whereas a closed-ended question has the respondent pick an answer from a given number of options. The response options for a closed-ended question should be exhaustive and mutually exclusive. Four types of response scales for closed-ended questions are distinguished:

Dichotomous, where the respondent has two options

Nominal-polytomous, where the respondent has more than two unordered options

Ordinal-polytomous, where the respondent has more than two ordered options

(Bounded)Continuous, where the respondent is presented with a continuous scale

A respondent's answer to an open-ended question is coded into a response scale afterwards. An example of an open-ended question is a question where the testee has to complete a sentence (sentence completion item).

Question sequence:

In general, questions should flow logically from one to the next. To achieve the best [response rates](#), questions should flow from the least sensitive to the most sensitive, from the factual and behavioural to the attitudinal, and from the more general to the more specific.

There typically is a flow that should be followed when constructing a questionnaire in regards to the order that the questions are asked. The order is as follows:

1. Screens
2. Warm-ups
3. Transitions

4. Skips
5. Difficult
6. Changing Formula

1. Screens are used as a screening method to find out early whether or not someone should complete the questionnaire.

2. Warm-ups are simple to answer, help capture interest in the survey, and may not even pertain to research objectives.

3. Transition questions are used to make different areas flow well together.

4. Skips include questions similar to "If yes, then answer question 3. If no, then continue to question 5."

5. "Difficult questions" are towards the end because the respondent is in "response mode." Also, when completing an online questionnaire, the progress bars let the respondent know that they are almost done so they are more willing to answer more difficult questions.

6. Changing Formula: Classification, or demographic question should be at the end because typically they can feel like personal questions which will make respondents uncomfortable and not willing to finish survey.

Basic rules for questionnaire item construction

1. Use statements which are interpreted in the same way by members of different subpopulations of the population of interest.
2. Use statements where persons that have different opinions or traits will give different answers.
3. Think of having an "open" answer category after a list of possible answers.
4. Use only one aspect of the construct you are interested in per item.
5. Use positive statements and avoid negatives or double negatives.
6. Do not make assumptions about the respondent.
7. Use clear and comprehensible wording, easily understandable for all educational levels
8. Use correct spelling, grammar and punctuation.
9. Avoid items that contain more than one question per item (e.g. Do you like strawberries and potatoes?).

10. Question should not be biased or even leading the participant towards an answer.

Questionnaire administration modes (as mentioned in Wikipedia, the free encyclopedia of internet)

Main modes of questionnaire administration are:

1. Face-to-face questionnaire administration, where an interviewer presents the items orally.
2. Paper-and-pencil questionnaire administration, where the items are presented on paper.
3. Computerized questionnaire administration, where the items are presented on the computer.
4. Adaptive computerized questionnaire administration, where a selection of items is presented on the computer, and based on the answers on those items, the computer selects following items optimized for the testee's estimated ability or trait.

Concerns with questionnaires

While questionnaires are inexpensive, quick, and easy to analyze, often the questionnaire can have more problems than benefits. For example, unlike interviews, the people conducting the research may never know if the respondent understood the question that was being asked. Also, because the questions are so specific to what the researchers are asking, the information gained can be minimal. Often, questionnaires such as the [Myers-Briggs Type Indicator](#), give too few options to answer; respondents can answer either option but must choose only one response. Questionnaires also produce very low return rates, whether they are mail or online questionnaires. The other problem associated with return rates is that often the people that do return the questionnaire are those that have a really positive or a really negative viewpoint and want their opinion heard. The people that are most likely unbiased either way typically don't respond because it is not worth their time.

Some questionnaires have questions addressing the participants gender. Seeing someone as male or female is something we all do unconsciously, we don't give much importance to one's sex or **gender** as most people mindlessly use the terms 'sex' and 'gender' interchangeably, unaware that they are not synonyms. Gender is a term to exemplify the attributes that a society or culture constitutes as masculine or feminine. Although your sex as male or female stands at a biological fact that is identical in any culture, what that specific sex means in reference to your gender role as a 'woman' or 'man' in society varies cross culturally according to what things are considered to be masculine or feminine. The survey question should really be what is your sex. **Sex** is traditionally split into two categories, which we typically don't have control over, you were either born a girl or born a boy and that's decided by nature. There's also a population of the world that are Intersex which is disregarded in the North American society as a sex. **Intersex** refers to the group of people that don't perfectly fall under the category of male or female. They are still a part of our community, however not many questionnaires have a box for people that fall under Intersex. These are some small things that can be misinterpreted or ignored in questionnaires.

SUMMARY OF QUESTIONNAIRE:-

The successful use of questionnaire depends on devoting the right balance of efforts to the planning stage, rather than rushing too early administering the questionnaire. Therefore the researcher should have a clear plan of action in mind and costs, production, organization, time limit and permission should be taken care in the beginning when designing of questionnaire, the characteristics of a good questionnaire should be kept in mind.

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QUESTIONS :-

- 1) Explain questionnaire, Discuss advantages and disadvantages of questionnaire?
- 2) Write a detail notes on questionnaire method.
- 3) State the important classifications of interviews and discuss in detail Pauline Young's typology of interview.