
UNIT-1 MEANING, DEFINITIONS & UTILITY OF SOCIAL RESEARCH

Structure

- 1.1 Introduction
- 1.2 Learning Objectives
- 1.3 What is Research?
- 1.4 What is Social Research?
 - 1.4.1 .Meaning of Social Research
 - 1.4.2 Definitions of Social Research
 - 1.4.3 Aims and Objectives of Social Research
- 1.5 Utility of Social Research
 - 1.5.1 Explore and extension of knowledge and wisdom in the subject matter
 - 1.5.2 Understanding Social Realities and Phenomena
 - 1.5.3 Understanding Social Realities and Phenomena
 - 1.5.4 Diagnosis of social problems and their analysis
 - 1.5.5 Planning and Policy Formulation
 - 1.5.6 Social Welfare
 - 1.5.7 Social Growth
 - 1.5.8 Social Prediction
 - 1.5.9 Development in Social Research Tools and Techniques
- 1.6 Let us sum up
- 1.7 Glossary
- 1.8 Check Your Progress: Answer Keys
- 1.9 Suggested Readings

1.1 INTRODUCTION

The present unit is all about the meaning, definitions, and utilities of social research. This unit is the first part of Block -1: Meaning and Significance of Social Research. This unit will help students learn basic knowledge of social science research and its importance in society. Prior to discuss the contents in this unit, let's discuss why we should go for research? Research is considered as the value addition to existing knowledge, and knowledge is something to do with knowing something. There are various sources of knowing something, like through acquaintance or detailed description of nature and character. Here the acquaintance source of knowledge is the commonsense knowledge. Take the example of drinking coffee. The commonsense

knowledge of ‘drinking coffee’ is considered as a refreshment beverage of day-to-day activities. If we go into detail description and its character of coffee, it contains caffeine, which is a drug and has stimulating effect on the brain. For many people it is not just refreshment, they drink for extra lift in their long day work or study. So there is a difference between commonsense knowledge and details description and character of content. The detailed description, nature, and character of content are documented through only research. So to understand the inherent, implicit, and truth of content or concept, we go for research, which can be verifiable and reliable. Research helps us to think ourselves away from commonsense knowledge. In this context, this unit will help the readers know the concept of social research and its utility.

1.2 LEARNING OBJECTIVES

The unit is designed to help you in conceptualizing

- the meaning of research and social research
- the difference between research and social research
- describes and analyses the definitions of social research provided by scholars
- the usefulness and significance of social research in our day to day life and society

1.3 WHAT IS RESEARCH

The term ‘research’ has been derived from the French word ‘*recherche*’, and is the combination of two words ‘re’ and ‘*cherche*’. The meaning of the word ‘*recherche*’ refers to seek out, or seek for or search closely. Likewise, the term ‘research’ consists of two words, ‘re’ and ‘search.’ The ‘re’ refers to again, and ‘search’ refers to finds out or looks up for something. The etymological meanings of the term reveal that research refers to look at something again and again. Then, why should we study something again and again? F. A. Ogg writes, ‘*research may or may not come to success; it may or may not add anything to what is already known. It is sufficient that its objectives be new knowledge or at least a new mode or orientation of knowledge*’. So the objective of the research is to explore and add new knowledge on the subject of study. But, what to study and how to study phenomena is the subject matter of concerned discipline, which varies from discipline to discipline. However, research as a universal process and method adds knowledge to the existing literature and reveals the facts.

In the process of exploring the facts, Clifford Moody (1927) writes that “*It comprises defining and redefining problems; formulating hypotheses or suggested solutions; collecting, analyzing and evaluating data; making deductions and making conclusions; and at last carefully testing the conclusions to determine whether they fit the formulated hypothesis.*” Further, John Dewey (1983) noted that “*research is*

considered to be the more formal, systematic, intensive process of carrying on the scientific method of analysis. It involves a more systematic structure of investigation, usually resulting in some sort of formal record of procedures and a report of results or conclusion.” From the above etymological meanings and scholar's definitions, it can be argued that research is a systematic and scientific study of particular phenomena to advance knowledge. Its aim and purpose are to discover the knowledge and truth of a phenomenon or subject matter. It is undertaken to answer the questions by carefully examining the studied phenomena using the systematic and scientific method.

Research has been carried out in diverse disciplines and subjects, i.e., natural science and social science, to advance their subject matter knowledge. As the subject of science, Anthony Giddens and Philip W. Sutton (2013) write, “*Science involves the use of systematic methods of empirical investigations, the analysis of data, theoretical thinking and the logical assessment of arguments to develop a body of knowledge about a particular subject matter.*” Both the discipline of research and its process cannot be identical in a scientific way due to the nature of the subject matter. However, as a subject of science, both disciplines use and follow systematic and scientific methods of investigation.

Check Your Progress Exercise 1.1

Note:

- I. Use the space given below for your answer.
- II. Compare your answer with the one given at the end of this unit.

Q1. What is research?

Answer:

Q2. What is the aim and purpose of research?

Answer:

1.4 WHAT IS SOCIAL RESEARCH

1.4.1 What is Social Research?

The approach and result of science and research are universal in nature. They provide a practical solution to the problems in the universe, which applies not only to natural or physical science but also to social science. As the subject matter of social science differs from the natural and physical sciences as well as the subject of their research and practical solution to the universe. As the subject matter of social science disciplines in general and sociology in particular deals with the study of society, community, groups, human beings, and their activities, social structure etc., likewise the subject of their research. So social research includes scientific investigation carried out in the discipline of social science. Like research, social research implies the advancement and (re)discovery of knowledge on the social phenomena or facts that existed in the society through a systematic process. Before discussing the aim, task, significance, and utilities of social research, let's look into the scholarly definitions for a clear understanding of social research.

1.4.2 Definitions of Social Research

The scholars from different social science disciplines have been provided and defined various definitions for the term 'Social Research' in their respective writings.

P. V. Young, in defining social research writes that '*Social research is the systematic method of discovering the new facts or verifying the old facts, their sequences, inter-relationship, casual explanations and the natural laws which govern them.*' Young's definition of social research reveals that it is a scientific process used to discover, rediscover, and verify the social facts, how they are ordered and interrelated through causal relationships. He further explains that social research studies how natural laws govern these social facts and phenomena through casual explanations in a systematic method.

Uwe Flick, in defining social research says that '*Social research is the systematic analysis of research questions by using empirical methods. It aims to make empirically grounded statements that can be generalized or to test such statements. Various approaches can be distinguished and also a number of fields of applications. The various aim can be pursued, ranging from an exact description of phenomena to its explanation or to evaluation of an intervention or institution.*' Like Young's definition, Flick also considered social research as a systematic method of analysis. Social research should use empirical methods to answer the questions and generalizing

the research findings. Social research can be used and pursued various approaches and aims to describe, analyses, explain or evaluate social phenomena.

B. N. Ghosh, in explaining social research writes that ‘*Social Research involves the application of scientific method for the understanding, studying and analysing of social life in order to modify, correct or verify the existing knowledge as a system.*’ Ghose's analysis of social research implies that social research studied social life by applying the scientific method. Social research not only understands and analyzes social life but also tries to verify, correct, and modifies the facts of social life.

So from the above definitions, it can be concluded that social research is a systematic and scientific study of particular social phenomena with an objective of advancing knowledge. It not only analyses and describes the studied society, social issues, human behavior, and individual problems through a systematic manner, rather discovers the casual relationship, (re)established new facts, verify the old phenomena and ultimately add knowledge to existing subject matter of study. However, knowledge production is the central force of social research as a part of scientific interests. There are three tasks of social research used in the process of knowledge creation. These are descriptions, understanding, and explanations of the scientific investigation of social phenomena. In social science research first action needs to be on the description of studied subjects or phenomena. It helps in understanding the context and meaning of studied phenomena. After understanding the phenomena, the last step is to look into the explanations and casual relationships between different aspects of studied social phenomena. Look into the Example – 1 for better understanding.

Example – 1

Let's take the example of COVID-19 as a new phenomenon of disease. To know and suggestive cure measures for this new diseases, its description, understanding, and explanation are necessary. In the first step, we need a detailed description of the COVID-19 and the experiences of COVID-19 patients. The description of the COVID-19 disease will help us understand the meaning, context, and effects of this new disease. So the description and understanding of the COVID-19 disease will help us analyze the explanations like how it spreads or what the symptoms are, or how it can be cured?

1.4.3 Aims and Objectives of Social Research

The aims and objectives of social research mostly vary from the different types and goals of the research. Scholars like P. V. Young, Goode and Hatt, B. N. Ghosh, and Ram Ahuja in their respective writings highlighted various aims and objects of social research. The important aims and objectives of social research are described below:

- Social research aims to understand the structure and function of society
- Social research studies individual behavior and social action and its interaction in the social system and institution.
- Social research investigates and evaluates the social problem to find out the solution of the problem to establish better social order
- Social research understand and explore the social phenomena, reality, and social life
- Social research develops and explores new social theories and concepts

These aims and objectives of social research are further divided into two categories based on their functions and motives in society. Scholars divide these two categories as ‘theoretical’ and ‘utilitarian. The theoretical aspects of social research are mostly associated with the academic purpose and aim to acquire knowledge on society and how it functions. It is considered as the basic research, where motivation is to acquire knowledge. Whereas the utilitarian aspects of social research deal with understanding social issues and problems and work towards ordering society through rectifying and removing the social obstacles. It deals with the solution aspects of problems, discussing the cause-effect relationship between social issues and social phenomenon. These aspects of research are mostly considered as applied research, which not only acquires the knowledge but also uses the knowledge for practical purposes to solve social problems. However, both aspects of research help and complement each other in understanding and solving social issues and problems.

Check Your Progress Exercise 1.2

Note:

I. Use the space given below for your answer.

II. Compare your answer with the one given at the end of this unit.

Q.3. What is Social Research?

Answer:

Q.4. What are the aims of social research?

Answer:

1.5 UTILITY OF RESEARCH

The above discussion on social research meaning, definition, aim and objectives, and subject matter of study gives a clear picture of what social research is? But, the question arises, why scholars did involves in social research? What is the use of social research in our society or in everyday life?, and what can be achieved in social research? In a universal sense, the usefulness of research is to the extension of knowledge in the subject matter and helps in understanding the studied subject, which is discussed earlier in the meaning and definition section of the social research. Besides these universal utilities, social research has its own practical utilities in society. The practical utilities of social research are discussed below.

1.5.1 Explore and extension of knowledge and wisdom in the subject matter

The first and foremost utility of social research is to explore and expand the existing knowledge in the subject of study and its discipline. The addition of new knowledge in the existing literature will bring potential growth in the scope and subject matter of study and steps forward towards achieving maturity and wisdom.

1.5.2 Understanding Social Realities and Phenomena

Social research assists in finding out the actual social realities, facts, and phenomena of societies in a more simplified way. It reveals the hidden and ground reality and truth of social phenomena by dismissing the ideas of taboos and superstitions. The truth of social phenomena is explored and described through reason and logic; it helps better understanding the different units of society. It also helps in developing and classifying various social concepts and ideas from research findings for better understanding and avoids confusion over different social units.

1.5.3 Control of Social Phenomena

The control over society and social phenomena is possible when someone has complete information on the society, its structure, its units, institutions, and how they are interrelated, functioned, and guide the human behaviors in the society. So it is social research that helps in gathering and documenting various aspects of information on society and human relationships. By acquiring knowledge over social phenomena helps understand the nature of laws that govern society, humans, and their inter-relationship. So social research also

helps bring social order and cohesion in society by controlling the social phenomena.

1.5.4 Diagnosis of social problems and their analysis

Social research helps diagnose and analyze the existing social problems in society, like unemployment, poverty, farmer suicide, deforestation, etc. This diagnosis helps to identify the nature and dimensions of a particular problem. The analysis helps to identify appropriate remedial measures for the problems.

1.5.5 Planning and Policy Formulation

The government's planning and policies are formulated from time to time to address the gaps in various development activities. All the planning and policy decisions in social sector development and welfare programs are taken up and finalized on the basis of inputs and suggestions received from social science researchers and their research findings. So social research provides the means, guidelines, and plans on the basis of its research findings to address and reduce the development gaps. The social science research findings help planning and policymakers formulate the perfect plan for implementing different developmental programs in society.

1.5.6 Social Welfare

Social research reveals the problems, needs, and necessities of a community or society. According to research findings, the welfare measures are taken up by concerned government departments through social welfare programs. Social research helps find actual causes of social evils and deviant activities and suggests necessary steps to bring order in society by eradicating social evils. Social research can provide sound guidelines for appropriate measures of welfare and reforms in society. It is the social research that helps the state formulate legislative measures to protect society by maximizing social welfare.

1.5.7 Social Growth

Social growth is achieved through the help of social research. Social research not only studies the different units of society and their relationship but also helps and pointed out the right direction for societal growth. Social research helps in maintaining the balanced growth between different parts of society. Different societal parts, their functions, and structures are ordered and balanced through social research. Social research also helps in better planning and

controlling different aspects of society, which ultimately leads to establishing better social order and growth.

1.5.8 Social Prediction

Social research helps to understand the social laws that are controlling, ordering, and maintaining different social facts and their interaction in society. These interactions of different facts are causal connections or causative factors that help social researchers to predict the relationship between different social phenomena and facts. Perfect prediction in social science research, though, is not possible in the majority of cases due to the complexity of social phenomena, diversified causal factors and their unstable relationship, but researchers used statistical measures for prediction. The earlier prediction on social governing laws and causal relationship between different social facts helps better control over social phenomena and ultimately helps in better planning. The projections help in fixing social goals for our future.

1.5.9 Development in Social Research Tools and Techniques

The social researcher used different tools and techniques to conduct research and analysis the findings of the research. The progress and development in social research and changing social circumstances help researchers become more innovative in collective information. With the innovations in research, the old and existing tools and techniques are modified and replaced with a new ones with the exigency of new situations. This helps advancements in the tools and techniques of social science research and can result in more efficient research.

Check Your Progress 1.3

Note:

I. Use the space given below for your answer.

II. Compare your answer with the one given at the end of this unit.

Q.5. Define social research and list out, what are the practical utilities in social science research?

Answer:

Q.6. How social research helps in the planning and policy formulation of government?

Answer:

1.6 LET US SUM UP

This unit has first discussed and provided the etymological meaning and definition of research. In explaining research, the unit provided and analyses the scholarly definition. Likewise, the meaning and definitions of social research are explained by providing the scholarly definitions of P.V. Young, Uwe Flick, and B N Ghosh. The three tasks aims and objectives of social research are highlighted and explained, followed by the functions and motives of social research. The second part of this unit discusses the utility and significance of social science research in society. Here, nine practical utilities of social research are highlighted and explained. Overall this unit comprises of meaning, definitions, and utility of social research.

1.7 GLOSSARY

- Research:** Research is a systematic and scientific study of particular phenomena to advance knowledge
- Commonsense Knowledge:** Commonsense knowledge is the information that all individuals have. It is considered as the general knowledge of something. It is universal in nature. It is based on the accumulated experiences, prejudices, and beliefs of the people, is often contradictory and inconsistent.
- Researcher:** Researcher refers to the person who carries out or conducted research activities respective of any discipline or subject.
- Social Research:** Social research is a systematic and scientific study of particular social phenomena to advance knowledge. It not only analyses and describes the studied society, social issues, human behavior, and individual problems systematically, but rather discovers the casual relationship, (re)established new facts, and ultimately adds knowledge to the existing subject matter of study.
- Scientific Method:** Scientific method or approach is a pattern of systematic scientific investigation for knowledge extension. It comprises of

observation, hypothesis, and verification. These three steps are applied to both physical and social sciences.

Utility: Utility refers to the usefulness of something on other. Like the social research utilities on the society or the studied subjects.

1.8 CHECK YOUR PROGRESS: ANSWER KEYS

Answer to Q.1: Research is a systematic and scientific study of particular phenomena to advance knowledge. It is different from the commonsense knowledge of the individual.

Answer to Q.2: The aim and purpose of research are to discover the knowledge and truth of a phenomenon or subject matter.

Answer to Q.3: Social research is a systematic and scientific study of particular social phenomena with the objective of advancing knowledge. It not only analyses and describes the studied society, social issues, human behavior, and individual problems through a systematic manner, rather discovers the casual relationship, (re)established new facts, verify the old phenomena and ultimately add knowledge to the existing subject matter of study.

Answer to Q.4: The important aims of social research are; social research aims to understand the structure and function of society, social research studies the individual behavior and social action and its interaction in the social system and institution, social research investigates and evaluates the social problem in order to the solution of the problem to establish better social order, social research understand and explore the social phenomena, reality, and social life, and social research develops and explores new social theories and concepts.

Answer to Q.5: Social research is a systematic and scientific study of particular social phenomena with the objective of advancing knowledge. The major points in the utility of social research are; explore and extension of knowledge and wisdom in the subject matter, understanding social realities and phenomena, control of social phenomena, diagnosis of social problems and their analysis, planning and policy formulation, social welfare, social growth, social prediction, and development in social research tools and techniques.

Answer to Q.6: Social research helps in planning and policy formulation of government. The government's planning and policy are formulated from time to time to address the gaps in various

development activities. All the planning and policy decisions in social sector development and welfare programs are taken up and finalized based on inputs and suggestions received from social science researchers and their research findings. So social research provides the means, guidelines, and plans based on its research findings to address and reduce the development gaps.

1.9 REFERENCES

1.10 Reference and Suggested Readings

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UNIT-2 MAJOR STEPS IN SOCIAL RESEARCH

Structure

- 2.1 Introduction
- 2.2 learning objectives
- 2.3 Steps in Social Research
 - 2.3.1 Define the research problem
 - 2.3.2 Literature Review
 - 2.3.3 Make the Problem Precise
 - 2.3.4 Research Design
 - 2.3.5 Determine the Sample
 - 2.3.6 Carry out the Research
 - 2.3.7 Interpret the Results
 - 2.3.8 Report the Research Findings
- 2.4 Let Us Sum Up
- 2.5 Glossary
- 2.6 Check Your Progress: Answer Keys
- 2.7 Suggested Reading

2.1 INTRODUCTION

The present unit is all about the major steps involves in the social research process. This unit is the second part of Block -1: Meaning and Significance of Social Research. This unit will help students learn the process involved in social research and how to proceed and carry forward with the research. Before going into detail about the content, let's discuss why we should go with the process or steps or what is the need of the steps in social science research. Before undertaking research, the researcher needs first to understand what are the process involved in it; otherwise, it will make it the researcher more difficult in reaching out the answers to framed research questions. For example, a construction building can't be constructed overnight or in one stage. For that, you have to make the foundation of the building, construction of pillars and beams, construction walls, covering the roof, plastering, furnishing, colouring, and in every stage, you need mason workers, labourers, resources, and other human resources to complete the task. So you can't skip one step or other to reach the goal, and without a foundation or pillars or walls, you can't cover the roof like that each step in the research is essential to complete the research work, and you can't skip any of the steps in reaching out the research objectives. In this context, this unit delineates the major steps involves in social research.

2.2 LEARNING OBJECTIVES

This unit is designed to help you in conceptualizing

- the process involved in social research
- the starting point of social research
- how to conduct a review of literature
- the design of social research
- how to carry out the research and interpret the results
- how to report the findings of research

2.3 STEPS IN SOCIAL RESEARCH

The research process is not a single activity rather consists of a number of close activities. Each activity in research is associated with each other in defining the whole research. The process involves a number of steps, starting from framing the questions to the documentation of the findings. The researcher goes through eight steps to complete the research. These include:

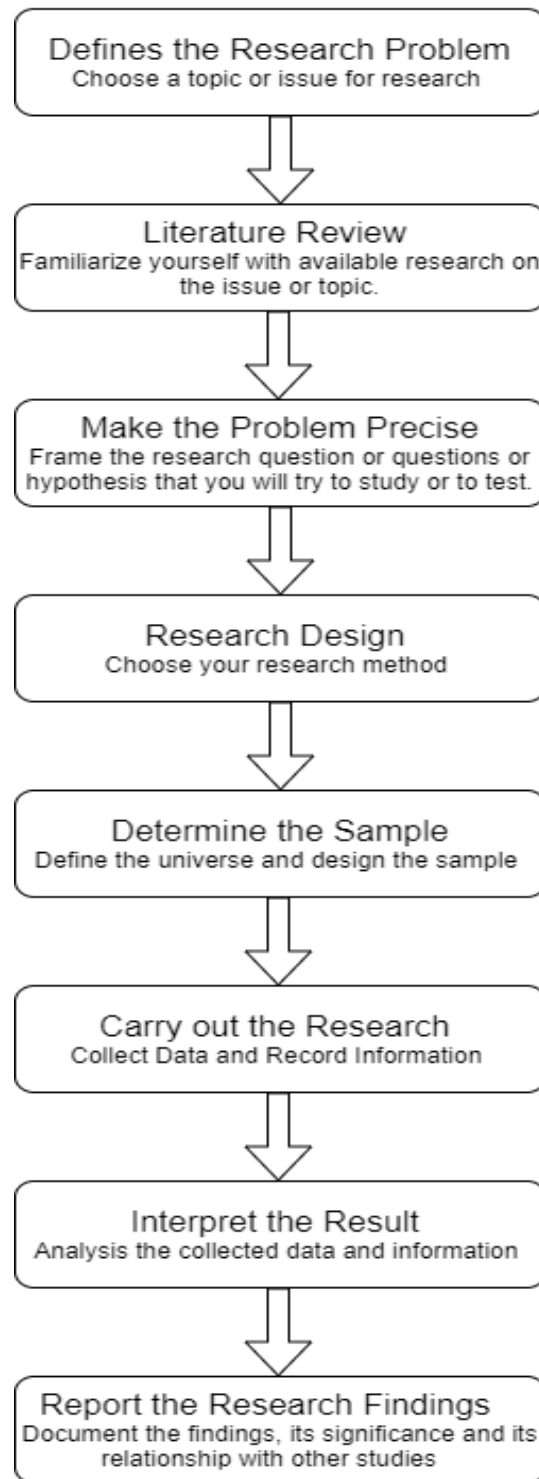
- Defines the Research Problem
- Literature Review
- Make the Problem Precise
- Research Design
- Determine the Sample
- Carry out the Research
- Interpret the Result
- Report the Research Findings

The researcher needs to follow the sequence or order of the steps in conducting research, and any deviation will lead to difficulties in producing quality research and completing the investigation.

2.3.1 Defines the Research Problem

The selection of a research topic can be based on a number of concerns and considerations. It may arise from theoretical, practical or intellectual concerns. The researcher framed and chose the research questions based on his/her interests and choices. The research problem and question is the starting point of all the research process. The social research begins with the problems;

Steps in Social Research



Anthony Giddens considered these problems as puzzles. The research problems or puzzles are not just considered as a lack of information in a particular topic rather, it is a gap in our understanding of that topic. Social research consists in identifying the actual problems rather than sampling answering the raised questions. Instead of answering, what is this?, the researcher should ask problem-solving questions i.e. why is this? The problem-solving questions are not just answered about the factual things but go another step and provide the explanation for the existence of factual things.

The social research questions should deal with relevant social issues, and their answers need to be leading towards some kinds of progress, i.e. problem solving, new suggestions, new recommendations or new insights. Besides addressing social issues, the research questions should be based on theoretical perspectives. The established questions must be derived from theoretical perspectives. Every research question needs to be appropriately formulated for a study that, it can be investigated through one or more social research methods. Most importantly, the questions formulated must be clear, focused and goal-directed. While characterizing the good research question, Uwe Flick writes research questions must be an actual questions. Like: “What are the causes of unemployment?” not “The Causes of Unemployment.” Because the last one is just the area of research interest but not a research question. Each research question needs to be either exploratory or descriptive or explanatory in nature.

There are three major conditions for research problem formulation. The first condition is research should have a systematic interest in the subject matter of study and which helps to think deeply about the problems. Second, field observation sometimes helps immensely to the researcher in formulating good research questions. It gives not only first-hand information but also provides practical or empirical knowledge over theoretical arguments, which help in generalization in the area of research. Third, the researcher may undertake a pilot survey or an experience survey and discuss the relevant matter with resource persons for comments and critical inputs.

The research questions or problems may be arises from practical problems or social problems, problems in theoretical assumptions, and intellectual questions. Besides these, ongoing projects and one research project can leads to other questions through raising issues that were previously not addressed. Social scientists discover these problems or puzzles or questions by reading the earlier contributions through research. So no piece of social research stands alone; either it is earlier evidence or practical problems that help in formulating the question.

Check Your Progress Exercise 2.1

Note:

I. Use the space given below for your answer.

II. Compare your answer with the one given at the end of this unit.

Q.1. What are the steps in social research process?

Answer:

Q.2. What are the condition for research problem formulations?

Answer:

2.3.2 Literature Review

The second step of social research process is the review of the literature. Once the researcher formulated the research problem, the next step is to review the available literature on a selected area of research. In this phase, the researcher reviews the existing literature. Review of literature provides knowledge on the area of study and helps to avoid unnecessary repetitions and duplications of research work. Mostly it provides the researcher with the existing gaps in the literature.

In defining literature review's C. Hart (1998) writes, *'the selection of available documents (both published and unpublished) on the topic, which contain information, ideas, data, and evidence written from a particular standpoint to fulfill certain aims or express certain views on the nature of the topic and how it is to be investigated, and the effective evaluation of these documents in relation to the research being proposed.'*

The researcher has to go through various types of literature. Literature may be a newspaper or magazine clip, or research article in journal or book chapter, or a research report, or project report, or a working paper, or an occasional paper, or a book, or conference proceedings, or government report or any database. In this context, research must be careful and choose the scientific literature or database for their review. The most important thing, the research needs to collect the materials areas and region wise. So that researcher can easily identify theoretical, methodological and empirical issues attached with the research question. The theoretical literature review will help in formulating the practical concept, definitions, and theories to be used in the field of research. Reviewing methodological research will help the researcher to select and decide the specific method for the research problems. The empirical literature review on the selected area will help in contextualizing the researcher approach. All the literature reviews on the selected research problem will help the researcher in developing the arguments of the research questions.

2.3.3. Make the Problem Precise

The third stage in the process of social research involves the formulation of a clear and precise research problem. The clarity in the research problems comes out after reading the available literature. It is the literature review that helps the researcher to establish good ideas on the issues and how to address the questions. The researcher needs to establish the questions properly and precisely from the literature so that study findings can be support or challenged through empirically gathered material or what we called qualitative data. In the case of the collection of quantitative or numerical data, the researchers can go for statistical testing to verify the established hypothesis. The hypothesis is nothing but a tentative assumption made to draw out the logical consequences of your research problem. The hypothesis should be clear, specific and precise as research questions. The research questions and hypothesis decide what type of data to be collected, what methodology and research design to be followed, and what types of methods of data analysis to be used.

Check Your Progress Exercise 2.2

Note:

- I. Use the space given below for your answer.
- II. Compare your answer with the one given at the end of this unit.

Q.3. What do you mean by review of literature?

Answer:

Q.4. What is hypothesis?

Answer:

2.3.4 Research Design

The fourth stage of the social research process is to prepare the research design. It is considered the central concept in research planning. Ragin (1994), in defining the research design writes that *'it is a plan for collecting and analyzing evidence that will make it possible for the investigator to answer whatever questions he or she has posed. The design of an investigation touches almost all aspects of the research, from the minute details of data collection to the selection of the techniques of data analysis.'*

The research design is prepared to answer the raised research question and hypothesis in the research. It is the stage where the researcher decides how the research materials are to be collected. In social science research there are different methods exists, and what a researcher chosen for the research is depends upon the objectives and what to

analysis in the study. A social research design may be exploratory, experimental, descriptive and diagnostic in nature. The exploratory research design tries to answer the ‘what’ type questions and discover the facts and insights of the study. In experimental research design, the researcher tries to answer the ‘why’ type research questions. Here researcher does an experiment to find out the cause-effect relationship of the facts in the study. The main purpose of this study is to test the hypothesis. The descriptive and diagnostic research design tries to answer the ‘how’ type questions. This research design is used to provide a detailed explanation and description about a particular phenomenon, facts, groups or community. The descriptive design helps the researcher in acquiring knowledge on the studied subject, whereas diagnostic research design deals with identifying the problems and test the association and dissociation between different variables. So research design is the blueprint for the collection, measurement and analysis of the data, which helps to answer the research questions and formulated hypothesis.

2.3.5 Determine the Sample

The researcher must then decide how to collect the data from the units of the study. The fifth stage involves determining the sample from the total universe of study. Here universe is the total population to be studied by the researcher, and the sample is the small elements of the total population that represent the whole. In defining sample, P. V. Young writes, ‘a *statistical sample is miniature picture or cross section of the entire group or aggregate from which the sample is taken. The entire group from which sample is chosen is known as ‘the population’, ‘universe’ or ‘supply’.*’ So the sample is taken from the total population or universe of study, and each sample has some universe behind it. The population or universe statistically refers to the aggregate of individuals or units from which a sample is drawn and to which the results and analysis are to apply.

The determination of sampling design is based on what research design the researcher follows to answer the research question or problem. Mostly the empirical studies included the sampling design to collect data from the field. The basic presumption of sampling is it must pick up a sample that will be ideal and represent the group or universe as a whole. A good sample always varies on the basis of research questions and the universe of study. A Good sample is to be seen that closely represent the universe of study. The selection of a sample needs to be unbiased and homogeneous to establish a good representative sample. Further, P. V. Young writes, ‘*the size of a sample is no necessary insurance of its representatives. Relatively small samples properly selected may be much more reliable than large samples poorly selected. The actual selection of the sample should be so arranged that every item in the universe under consideration must have the same chance of inclusion in the sample.*’ So the

proper and appropriate selection of the sample is more reliable than the size of a sample in the research. The sampling method can be a probability or non-probability sample. The forms of sampling methods are discussed in detail in later blocks and units of the paper. Particularly in the sampling design, the researcher decides on the questions of the appropriateness of specific forms of sampling.

Check Your Progress Exercise 2.3

Note:

I. Use the space given below for your answer.

II. Compare your answer with the one given at the end of this unit.

Q.5. What are the types of social research design?

Answer:

Q.6. What is research design?

Answer:

Q.7. What is the difference between universe and sample?

Answer:

2.3.6 Carry out Research

Next stage after sample design is to carry out the research or collect the data from sample respondents. Before collection of data researcher needs to take the decision to choose the instruments and tools to be used for data collection. The selection of instruments like questionnaires, interview schedules, case studies, group discussion, observation or narratives, needs to develop by the researcher on the basis of the study. All the selection of instruments must be related to answering the earlier established research question. A study may use multiple instruments to collect primary data from the field. All the collected data and information needs to be recorded properly through their tools and instruments for further analysis. While collecting data or information from respondents or field, researchers might go through unforeseen practical difficulties. Take the example, it can be possible that sometimes the earlier contacted person for questionnaire response may be impossible to contact to fill the questionnaire, or a corporate or school may not give you the access to carry out your

research in their activities. These types of unforeseen practical difficulties sometimes delay the period and process of research. Besides these unforeseen difficulties, sometimes bias may enter into the process of data collection from respondents. For example, while collecting information or discussing with the respondent's researcher may unknowingly be entered into the one-directional way of discussion or more involved in their emotional views, such things will lead to deviation from actual purposes. So the researcher needs to be very careful while collecting the data from respondents to avoid unforeseen difficulties and bias responses.

2.3.7 Interpret the Results

Once the material has been gathered collectively from the field through the tools and instruments, the next step is to analyze and interpret the collected data. Collected data can be more useful when that is properly interpreted and scientifically analyzed. The analysis of data also varies on the basis of the qualitative and quantitative information collected from respondents. There are two types of data analysis; they are primary and secondary data analysis. There are various steps in analyzing the collected data, which includes coding, editing, and classification of data. The data either manually or through the use of software (SPSS, R, Stata) entered into drawing the tabulation, graphical representation and statistical assumption from the collected data. In this stage, the researcher works out to associate the results with the research problem. In this process researcher also test the earlier formulated hypothesis from the research and analyze whether the results support or reject the hypothesis. After data collection and analysis, the researcher here interprets the data to arrive at a generalization. It is the interpretation where the researcher can properly understand the significance of the study. It may be possible for the researcher to reach out a clear answer to the questions or not after the interpretation of data.

2.3.8 Report the Research Findings

The last step of the social research process is to document and report the research findings, significance, and relationship with other studies. The research results and findings are generally published as a thesis, report, journal article, working paper, occasional paper, or through a book. These documents provide detailed accounts of the carried out research and try to provide the justification to the research questions. To report and document the research may have various aims; these include documenting the research, showing how you have arrived at the result, to present results on the line of objectives of the research, and legitimize the research by proving that the results are not arbitrary, rather rigorously based on the collected data from the respondents. Types of research reports and documents may vary in their content structure. But, the general structure of the content in the research communicated document must contain; introduction, review of literature, research questions, study methodology, data analysis

and findings of the study, conclusion, and bibliography or reference. While writing the research report, the researcher needs to focus on maintaining the basic and essential requirements for producing a quality report. It includes; the researcher must have clarity in thought and language while writing the report, the researcher needs to be clear on the used concepts and concepts should be properly used in writings, the researcher should be careful while using terminology in the research writing, the researcher should clearly write and clarify the research problem in the report, the presentation data and statistics of the report should be clear and understandable, the researcher report needs to be error-free from grammar and spellings of used language, and report should be properly chapterised.

Though this is the end of the research process, sometimes research findings and reports indicate certain unanswered questions and suggest further research.

Check Your Progress Exercise 2.4

Note:

I. Use the space given below for your answer.

II. Compare your answer with the one given at the end of this unit.

Q.8. Give an example of tools for data collection?

Answer:

Q.9. What are various steps in analyzing collected data?

Answer:

Q.10. What is the general structure of content for writing a research report?

Answer:

2.4 LET US SUM UP

This unit is all about the steps involves in the process of conducting social research. There are eight steps involves in the process. These include; define the research problem and finalization of the topic, review the literature on the selected problem, make the problem precisely and can construct a clear hypothesis for the problem, the researcher prepare the blueprint of the research, determine the sample size from the universe, carry out the collection of data after selection of tools and techniques, interpret the result from the collected data, and report the research findings. Each step of research has its own importance, and the researcher should follow these steps orderly manner to answer the research problems and puzzles.

2.5 GLOSSARY

Categorization:	Allocation of certain events to a category and summarizing several identical or similar events under a concept.
Coding:	Coding in research refers to allocate labels or numbers to a piece of data.
Generalization:	Generalization involves inference from a small number (sample) to a large number (universe).
Hypothesis:	In social research, the hypothesis is certain tentative assumptions and presumptions on the research problem that may prove or disprove with research findings.
Research Design:	Research design is a blueprint for a research plan to answer the research question.
Sample:	Sample is the small elements of the total population that represent the whole
Sampling:	The selection of cases, numbers, or materials for the study from a larger population.
Universe:	Universe is the total population to be studied, where the researcher collects the sample respondents.

2.6 CHECK YOUR PROGRESS: ANSWER KEYS

Q.1. What are the steps in the social research process?

Answer: There are eight steps involves in the social research process. These define the research problem, literature review, make the problem precise, research design, determine the sample, carry out the research, interpret the result and report the research findings.

Q.2. What are the conditions for research problem formulations?

Answer: There are three major conditions for research problem formulation. The first condition is research should have a systematic interest in the subject matter of study. Second, field observation sometimes helps immensely to the researcher in formulating good research questions. Third, the researcher may undertake a pilot survey or an experience survey and discuss the relevant matter with resource persons for comments and critical inputs.

Q.3. What do you mean by review of literature?

Answer: Review of literature is a process through which the researcher goes through various literatures on the area of research or research problem to finds out the existing gaps in the literature and to help avoiding unnecessary repetitions and duplications of research work.

Q.4. What is hypothesis?

Answer: The hypothesis is a tentative assumption made to draw out the logical consequences of your research problem.

Q.5. What are the types of social research design?

Answer: There are four types of social research design, which includes exploratory, experimental, descriptive and diagnostic.

Q.6. What is research design?

Answer: Research design is a blueprint for the research plan to answer the research question. It helps in the collection, measurement and analysis of the data, which helps to answer the research questions and formulated hypothesis.

Q.7. What is the difference between universe and sample?

Answer: Universe is the total population to be studied by the researcher, whereas sample is the small elements of the total population that represent the whole.

Q.8. Give the two examples of tools for data collection?

Answer: Tools of data collection are used to collect data and carry out the research. Questionnaire and interview schedule are two examples of tools for data collection.

Q.9. What are various steps to analyzing collected data?

Answer: There are various steps in analyzing the collected data, which includes coding, editing, and classification of data. The data either manually or through the use of software (SPSS, R, Stata) entered into drawing the tabulation, graphical representation and statistical assumption from the collected data.

Q.10. What is the general structure of content for writing a research report?

Answer: the general structure of the content in the research communicated document must contain; introduction, review of literature, research questions, study

methodology, data analysis and findings of the study, conclusion, and bibliography or reference.



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UNIT-3 SCIENTIFIC METHOD- CHARACTERISTICS

Structure

- 3.1 Introduction
- 3.2 Learning Objectives
- 3.3 Characteristic Features of Scientific Method
 - 3.3.1 Empiricism
 - 3.3.2 Validity
 - 3.3.3 Reliability
 - 3.3.4 Generality
 - 3.3.5 Verifiability
 - 3.3.6 Predictability and Control
 - 3.3.7 Objectivity
 - 3.3.8 System
- 3.4 Let us sum up
- 3.5 Glossary
- 3.6 Check your progress- Ans Keys
- 3.7 References

3.1 INTRODUCTION

Man is always inquisitive of unraveling the facts which have been revolving around him. He is keen in exploring diverse avenues of reality relating to the facts and events to accumulate valid knowledge about the numerous factors of human experience. However, it was observed that personal pre-conceived ideas influenced the way of accessing the evidences and where due attention was not paid to inquire the authenticity of the evidences elicited from all these sources. The result was not consistency in the description of the same facts and events time and again. Hence, in order to obtain valid knowledge, scientists, philosophers and thinkers have employed variety of methods.

In the midst of different methods, the methods of science are perhaps the most widely used method of uncovering new knowledge and exploring new reality. This is so as reliable knowledge is acquired from science as it ultimately intends to evidences and statements which are subject to empirical testings.

The scientific approach has one distinctive inherent attribute that no other method of attaining knowledge has, i.e., objectivity. There is a well-conceived self-control

mechanism all along the way to the scientific knowledge. This mechanism is so operated that it not only controls and verifies the scientist's activities and conclusions, but it also keeps the scientist away from his personal ideas, perceptions, values, norms, belief system and even affectivity etc. Thus, the approach helps the scientists to attain at objectivity.

To what extent is the scientific approach helpful in studying the problems of society? How can we gain true knowledge about the various dimensions of human experience? To be particular, how can the scientific method be of value in understanding social phenomena? In response to these enthusiastic queries, our approach or method would be first, to understand the meaning of science and then to examine the scientific approach, its assumptions and aims and finally to have an insightful and minute look to ascertain how it can assist social scientists to understand thoroughly a social phenomenon.

By 'research' is meant any enquiry or investigation regarding any phenomena or events in order to uncover new knowledge, new facts, and also to modify the existing knowledge. In simple terms, research can be understood as an activity that consists of two interrelated activities, namely, i) asking questions ii) being curious to answer them. Science incorporates a body of knowledge and a system of procedures. A scientific research means an investigation carried on through systematic procedures. Thus, study carried out in the field of any science comes under scientific research. In this sense research in behavioral or social sciences is also scientific.

Scientific method and social research both are inextricably interwoven. The philosophy comes to all sciences and all researches are the concept of scientific method. Once it is a science there has to be 'scientific method'. Without scientific method there is no science. It is obvious that it would not be possible to hold the notion of comprehending the nature as well as the content of research without a recognizing a scientific method. The method used in scientific research is popularly known as scientific method. It consists of three vital steps i.e. 1) systematic observation, 2) classification and 3) interpretation of data. Through these steps, scientific method results in not only verifiability of the facts, but also it yields the certainty in the reliability of conclusions. Science goes with its method not with its subject matter which is viewed by Scholar Staurt Chase. In a same lens, Karl Pearson also opines that the unity of all sciences lies alone in its method not in its material. It further implies that the subject matter may vary in terms of time and space, but it is not so in case of scientific research. Therefore a person who employs scientific method is called a man of science. Thus, the objective of science or any other field of knowledge is to accumulate systematic knowledge about the empirical world.

The word ‘science’ is derived from the Latin word ‘scientia’ which means ‘to know’. Science refers to the accumulation of systematic knowledge. Science believes in describing, explaining and understanding of diverse phenomena of nature and research concerns special emphasis on systematic and critical enquiry. Knowledge is the goal of science. Systematic is the means or procedures adopted in its proper sequence for arriving at the goal. In other words being Systematic is emulating the pre-designed steps one by one and knowledge is the ultimate end. Scientific method refers to those procedures that are followed systematically with a proper sequence in order to gain dependable knowledge or for asserting the truth.

Scientific method can be defined as; “ A collective term denoting the various processes by the aid of which the sciences are built up”.

“There is no shortcut to truth, no way to gain knowledge of the universe except through the gateway of scientific method”- **Karl Pearson**.

Lundberg – states that scientific method consists of systematic observation, classification, and interpretation of data. The main discrepancy between our day to day generalizations and conclusions usually recognized as scientific method lies in degree of formality, rigorousness, verifiability, and general validity of the later.

Karl Pearson- “ The scientific method is marked by the following features, a) careful and accurate classification of facts and observation of their correlation and sequence, b) the discovery of scientific laws by aid of the creative imagination, c) self-criticism and the final touch stone of equal validity for all normally constituted minds”.

Black and Champion (1976) define that “scientific research consists of obtaining information through empirical observation that can be used for systematic development of logically related propositions attempting to establish causal relations among the variables”

The learning of the facts of a particular branch of science without learning how to derive them or other presently unknown facts is really not becoming a scientist:

“The authors believe that of all the things which may be learned in proceeding through the various steps in formal education – particularly during the later steps – nothing is more valuable than the mastering of sound principles of methodology”.

For the purpose of understanding the concept of the scientific method there has to be made a distinction of certain terms with other allied terminologies to have devoid of ambiguity.

(Theory – It refers to those generalized statements the validity of which has already been tested. In other words, it also implies to ‘logically interrelated sets of propositions from which empirical uniformities can be derived’.

Method – It is a technique or tool applied in order to extract required data. And it is also a step followed for obtaining knowledge based on empirical observations and logical ethos.

Methodology- It refers to that research is based on a philosophy that incorporates postulates as well as certain principles (which are logically correlated) employed thoroughly by the researcher to extract data and eventually reaching at the conclusion. It provides a logic of scientific investigation or methods)

The scientific method involves the application of institutional principles, procedures, and techniques of acquiring new knowledge as also for refining existing knowledge. Unlike common-sense beliefs and religious dogmas, the scientific method relies on clearly defined theory, logic and methods to study a problem.

3.2 LEARNING OBJECTIVES

After being familiar with this present unit, you can understand and access to:

- State and describe the meaning of the concept of scientific method.
- Delineate the statement –‘ Objectivity is an inherent attribute of scientific research’.
- Analyzing different characteristics of scientific method in details with proper instances.

3.3 CHARACTERISTICS FEATURE OF SCIENTIFIC METHOD

There is no such thing as the scientific method. The methods of science vary from one field of enquiry to another. They vary from one research worker to another within a field, and even from investigation to investigation by a single worker. It is feasible, however to find a pattern common to virtually all scientific research. This pattern consists inevitably of six elements or steps: **(1)** the assembly of facts or existing information which are empirical evidences **(2)** Scientific conclusions reflecting the result of being truthful **(3)** A technique producing the same result with consistency **(4)** the formation of a system of general propositions to explain the behavior of the facts : **(5)** the prediction, which is an explanation obtained by the deduction from the testing hypotheses not already known from the mere compiled facts: **(6)** the testing of the prediction or verifying the observed facts: **(7)** devoid of personal or value judgments to achieve objectivity **(8)** Science proceeds on an orderly manner or systematically.

3.3.1: Empiricism –

Scientific method relies on empirical evidences which are the first and foremost element of studying the development of science and scientific research. Empiricism came to be accepted more in the 1950s and 1960s onwards by the academics. Today some writers refer to the emergence of a new stage of research, the post-empiricism research. Empiricism is first seeing or observing certain facts and then believing. Observations are to be taken in controlled conditions by qualified observers. Empiricism means replying through experiment. Science is not only with respect to what it is, but also why and how. Experiment is considered a way of compiling the procured evidences so as to allow one to derive inferences over the hypotheses. A test is made to examine if either variable occurs without the other. For instance – Flood situation in Bhadrak. Scientific method is always based on hard facts or true reality.

The scientific investigation is empirical in the sense that it has to be tested or checked against objective reality and each study must be subjected to empirical enquiry. In this way testing one's hypotheses or theories systematically and empirically makes the results of scientific research distinct from the non-scientific ones.

Conclusions are not established unless they are supported by sufficient data. This attribute provides data and data provides the conclusions and finally truth is uncovered. This happens as the conclusions get external validity. In other words truth is established on evidences only. This is arrived through systematic process. Evidences are tested for reliability.

3.3.2: Validity-

Any measuring instrument is valid when it does measurement with most accuracy the objects or individuals and their characteristics. Relevant queries arise here are:

- a) What does it measure?
- b) Are the data it produces relevant to the characteristics in which we are interested?
- c) Does the difference in result represent true differences in the characteristics being measured or are the differences due to influence of other factors?

3.3.3: Reliability –

Reliability is the inherent attribute of any scientific research. It refers to the degree to which scores or result of a test remain same and constant for the same content of measurement over times. In the words of Kerlinger- “the relative absence of errors of measurement in a measuring instrument”. The success of measurement relies on the extent to which errors can be eliminated. In social sciences the instruments of investigation are interview schedule, content analysis and scaling techniques and questionnaire also.

The reliability of a technique is subject to the way as it is constructed and employed. The technique is highly dependable only when it remains highly reliable. There are three diverse avenues by which reliability of a measuring instrument is made for test:

i) If repeated study of the same thing with the same instrument of measurement under the same conditions produces the similar outcomes then only the said instrument can be adorned with the status of being reliable.

ii) The second way of knowing the reliability is by measuring the exact quantum of error in a measuring instrument.

iii) The third way of testing the reliability is by knowing whether the measures obtained from a measuring instrument are true measures of the property being measured. That is, whether the measures are accurate or not.

3.3.4: Generality –

Science is general because objectives of science are to develop and extract general laws of the universe on the observation of the pattern shown by the selected phenomenon. This general law is known as a scientific law as scientific conclusions are not particularistic but general in nature. They are no way concerned with the unique and specific features and behaviors of the individual units but connect to the characteristics of commonality. The generalizations are drawn not only based on selected individuals but also the individuals possessing similar background who have not been selected for the study purpose. In the words of MacIver, “ such a law is simply another name for a carefully described and uniformity recurring sequence of conditions”. Science is a set of general laws logically connected which makes it feasible to predict happenings of a particular event. Science uses facts to test general theory and from general theory it is feasible to make prediction about particular fact.

Individual opinion does not find any scope under the concept of scientific method. So, scientific laws are universally applicable irrespective of time and space. Logic helps in the establishment of the generality of proposition through its method of deduction and induction. The mortality concept of men can be understood through induction and even both deduction method.

3.3.5: Verifiability –

The scientific method never complete after the formulation of general laws is accomplished. Because the accuracy of general laws need to be verified over time. Scientific research is a continuous process of verification. Process of verification consists of repeated study of the same thing under the similar condition in order to

check the accuracy of the conclusion or inferences drawn. It further means that conclusions or results derived from following scientific method are subject to verification at any time if required.

Verification presupposes that the phenomena must be capable of being observed and measured. According to Lundberg – ‘‘if the verification of deduction involves condition of observation which is impracticable or impossible of attainment the theory is metaphysical rather than scientific’’. The validity of scientific principles can be ascertained by examination. This validity is their essential condition in the absence of which they forfeit their claim to the title of scientific laws. Scientific method relies on verifiable elements. Science provides scope to verify each and every statement told about the events or fact at any time. Verifiability means ascertaining the truth of proposition or unless data or evidence is verified, the conclusion becomes more metaphysical or unreliable rather than being scientific in character. It denotes the actual character of the phenomena beyond any form of skepticism.

For Instance – God is omnipresent or omnipotent which is purely metaphysical. Because, it cannot be exactly measured and observed directly. In other case such as only a matter expands on being heated which is scientific as it can be exactly measured and verified frequently but producing the results consistently. Now in order to verify this statement we can ourselves heat a matter and watch its consequent condition. Thus, conclusions of research are subject to verification. Simple observations are not of any use.

If the prediction made is found to be correct or if repeated study produces the same result then the study can be considered with accuracy as well as reliable. Verification consists of corroboration of the expressed results, generally by the replication of the observation by the researcher being ethically sound.

The element of verification of scientific research confirms itself with four chief aspects: a) the logical structure of the undertaken hypotheses b) the precise and concise methods c) Criterion of reliability d) the credibility of the study and the problem of verification.

3.3.6: Predictability and Control:

Another characteristic of it is that its result or conclusion can be predicted with sufficient accuracy. Predictability means foretelling the future in advance. The nature of phenomena can be predicted is based on two factors.

- A) The establishment of regularity of relationship

It means the relationship between two minimum variables occur over and over again. For Instance – Full moon will appear on a particular day. Such sort of prediction is made possible under the scientific laws or method. Because the position of the moon is governed by the stable laws regarding the position of the earth and the sun simultaneously. It would have been not possible to make an accurate prediction if they were changing their path too often. Here the moon is governed by them. Often such type of accurate prediction seems tough in case of social phenomena.

B) Uniformity of laws by nature

It suggests that the nature or the natural processes are governed by certain stable laws. For instance – When the temperature of water falls below 0° centigrade it will turn into ice.

3.3.7: Objectivity –

It is a term diametrically opposed to ‘subjectivity’. Objectivity is fundamental to all sciences since the goal of all sciences is to unravel the naked truth. At a surface level, it appears very amenable to achieve but in practice it’s not so exactly. Hence objectivity is a residual term. According to Wolfe- ‘it is the first requisite of all sound knowledge’. Objectivity in scientific method refers to the fact that the conclusions are free from individual choices, biases and prejudices and pre-conceptions. In fact, if the investigator gives much priority on his own beliefs, prejudices, pre-conceptions and impressions, the results of the investigation are not real and factual. Objectivity in other words implies to the repetition of same event under practically identical conditions (Lundberg, 1939).

Objectivity is inevitably required for another element i.e. verification. Objectivity has been defined by Lowell J. Carr, in these words, ‘objectivity of truth means that phenomenal world is a reality independent of the beliefs, hopes or fears of any individual all of which we find out not by intuition and speculation but by actual observation. The sole aim of it is that all persons ought to arrive at the same conclusions about the phenomenon under the study. For example when we say that a crow is black and this is an objective statement. Because a crow appears blackish to each and every person undoubtedly. But if we say crow is the most useful and precious bird and this statement lacks an objective character since everybody may not agree with this point.

Thus, Scientific method relies on objective evidences and objectivity provides the external validity to the conclusion. And the use of the term of objectivity is based on

the concepts a) devoid of personal biasness, b) devoid of value judgment c) based on evidence and facts.

3.3.8: System –

While all other characteristics relate to the goal or result obtained out of scientific method, the characteristic called system relates to the means employed that the scientific method is systematic and procedural in nature. It means all the steps in social research are followed rigorously in their proper sequence. So that plants may meet the desired result.

The scientific conclusions are not only true but also they are born of systematic mode of investigation. This is what Lundberg says, ‘formality and rigorousness’ and Wolfe calls it as ‘system’. The result arrived at by means of haphazard methods, even if true, cannot be called scientific because their accuracy is only accidental.

Science proceeds on an orderly manner. It never proceeds haphazardly. Knowledge of science is systematic, because there is internal consistency. New knowledge is based on past knowledge. Science never claims absolutely truth at any point of time because science changes, alters systematically being evolved.

Scientific method is systematic. Because it is like an Occum’s razor. So, it constitutes three principles as followings.

- i) Rigorousness of procedures
- ii) Formality of principles
- iii) Validity of conclusions

The first two relate to the technical aspect and the third one relates to the logical aspect of scientific method.

3.4 LET US SUM UP

All above characteristics of scientific method point out that any generalization based on this type of investigation is true. A systematically collected body of scientific evidence is rarely challenged. No wonder, Zikmund has also viewed that the data collected haphazardly cannot be regarded as scientific inquiry.

3.5 GLOSSARY

Objectivity- Objectivity of truth means that phenomenal world is a reality independent of the beliefs, opinion, ideas of any individual or the investigator himself

or herself. In an objective study, the phenomena are studied in their actual form without any influence of personal expectations and beliefs and preconceived ideas.

Empirical Evidences- Truth is established on evidence only. This is arrived through systematic process. Evidences are tested for reliability.

Generalization- Science makes generalization. It is not in isolation but commonality of a series of events.

Verifiability- Science provides scope to verify each and every statement told about the event or fact at any time.

Systematic- Science proceeds on an orderly manner. It never proceeds haphazardly. Knowledge of science is systematic, because there is internal consistency.

Reliability- Science becomes reliable when it produces same result under identical situations. It becomes reliable, if it helps to predict accurately.

Phenomena- A phenomena or event is observed in terms of attributes, consequences and becomes subject of study. It is taken as phenomena in behavioral or social sciences.

3.6 CHECK YOUR PROGRESS- ANS KEYS

Activity-1

Under which conditions and parameters we can regard an instrument as reliable? Try to establish the relation between validity and reliability and they are helpful to a researcher? Do you agree with the statement that ‘Validity is a precondition for achieving reliability’?

Activity- 2

Can you see what needs to be done for the researcher to prove a fact whether it is verifiable or not? You can do this by relating to a topic with the corresponding reality in practice.

Activity-3

Are you agreeing with the proposition that ‘a pure science is predictable in real sense over time’?

Activity-4

Try to draw some instances in favor of sociology as a general science with the special reference to our social life.

Activity-5

Delineate different characteristic features of scientific method in details with suitable instances?

Activity-6

How objectivity is a vital component of scientific method inherently, explain?

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UNIT-4 APPLICABILITY OF SCIENTIFIC METHOD

Structure

- 4.1 Introduction
- 4.2 Learning Objectives
- 4.3 Applicability of Scientific Method in Studying Social Phenomena
 - 4.3.1 Complexity
 - 4.3.2 Predictability
 - 4.3.3 Subjectivity and Intangibility
 - 4.3.4 Dynamic Nature of Social Phenomena
 - 4.3.5 Interdependence of cause and effect
 - 4.3.6 Difficulty in the Use of Experimental Method
 - 4.3.7 Lack of Homogeneity
- 4.4 Let Us Sum Up
- 4.5 Glossary
- 4.6 Check Your Progress- Ans Keys
- 4.7 References

4.1 INTRODUCTION

A subject comes to be known as a science only when it is understood with the use of scientific method in it. The success of science lies in the success of scientific method. Sciences are of two types, positive sciences and normative sciences. Positive sciences further have been categorized into physical sciences and social sciences. Physical sciences incorporate physics, Chemistry, Biology, Botany, geology, etc. Social sciences incorporate Sociology, Economics, and History etc. Today physical sciences have obtained success spectacularly. Social sciences however, have not attained equal quantum of success not their conclusions are expected to be completely valid and specific. In fact, both behavioral sciences and physical sciences are quite different from each other. When scientific method has been most accurately employed in case of physical sciences, it cannot be so conveniently and meaningfully employed in case of social sciences. The principal ground of this discrepancy is that whereas the subject matter of physical sciences is particular and material generally, the subject matter of social sciences is conscious and subtle enough. Hence scientific method cannot be so accurately employed in natural sciences. This brings us to the nature of social phenomena. It is only after an insightful and lucid observation and discussion, we can be certain whether scientific method can be applied in studying a social phenomenon or not.

4.2 LEARNING OBJECTIVES

After going through this unit, you ought to be able to:

- Distinguish social phenomena from natural phenomenon
- State and delineate the compatibility and relevance of the relationship between social science and scientific method
- Explain, what are those actual concrete limitations of using scientific method while studying societal phenomenon

4.3 APPLICABILITY OF SCIENTIFIC METHOD IN STUDYING SOCIAL PHENOMENA

Social research deals with the social phenomena, no doubt. But controversy arises here that can scientific method be applied in the field of social research or studying social phenomena. There are two groups of people who opine differently that some are in favor and some are against to this. So that we have to acquaint ourselves with certain difficulties which may be confronted in the application of scientific method during the period of investigation of social phenomena.

4.3.1: Complexity –

Complexity simply means that lack of universality, absence of order, lack of regularity of relationship, and lack of regularity of patterned relationship. This sort of complexity is only seen in case of social sciences. Social phenomena are found to be very much complex and intricate. Society consists of social relationships. Social relationships manifest in the mutual behavior of human beings. Human behavior is complex and vivid. This complexity makes its study more difficult than that of physical phenomena. It has been rightly pointed out by G.A. Lundberg, ‘‘Perhaps the most frequently urged deficiency to a true science of human group behavior is the complexity of its subject matter’’. In fact, innumerable factors influence human relations and behavior, of which the most prominent are geographical, economic, social, psychological, political, religious and cultural aspects. Apart from this, many more latent factors still influence and determine also the behavior of human beings. All these make human behavior dynamic and intricate to a great extent. It further makes it difficult to control and determine. But the entities determining physical phenomena may be easily controlled which is not like that in the case of social phenomena.

As the factors causing social phenomena are not specific and to be particular, it is a herculean job to find out cause-effect relationship everywhere and at any time. For instance, the economic factor does not carry the same influence everywhere. Therefore, as compared to natural science phenomena, the societal phenomena are found to be much more intricate. Take for another illustration – no two persons are

alike and behavior changes from time to time under the pressure of circumstances. Under such conditions, it appears almost impossible to formulate any law that guides human behavior. It is therefore said that because of this complexity, the social data can be put into scientific test.

Arguments Against-

It is not wholly correct argument advanced by the following reasons.

i) In the midst of complexity, there is always underlying unity. It is correct that two individuals are not similar, but there is a fundamental attribute of commonality prevails to everyone. Take for an illustration if everyone is pleased when they are admired and feels disgusting when they are scolded. They may be in a different degree but the influence is exactly same.

ii) However, this does not mean that scientific method cannot be used in the field of social phenomena. In fact Complexity is not an absolute term, it is relative. A subject matter is complex as long as our means of enquiry are not available to probe it. For example- to a baby, the sayings of elders are difficult. But as he grows up and understands things, then the complexity start to disappear.

If the means and methods are sufficiently devised, the same subject matter will not appear much more complex. This is particularly found to be in social phenomena. As means and methods in the field of social sciences commence to develop with an expected improvement, then social phenomena will also become sufficiently amenable and subject to scientific enquiry, no doubt.

Equal degree of complexity among physical sciences as well as natural sciences prevails. For example – electrons in an atom do not move according to any system, thus does not hold good especially.

4.3.2: Predictability –

Predictability is an essential nature of a science. In case of physical science, predictability is proved to a great extent. The laws of science are true irrespective of time and space. For example, the time and date of the eclipse of the moon and the sun can be exactly predicted; while no such exact prediction can be made about trends of social change in social institutions like family and marriage etc. Similarly, the behavior of human individuals cannot be exactly predicted. It is difficult to predict as to who will commit suicide and when and why. There are several reasons why prediction is not feasible about social phenomena. Social phenomena are complex, abstract, dynamic, specific and qualitative. Therefore, prediction about them is not easy. Man is naturally a complex and dynamic creature. It cannot be exactly determined as to what will be the influence of a particular environment on a particular

individual. Neither the human circumstances nor their influence on human beings is definite. Therefore, it is difficult to predict about the causes of social events.

But in social sciences, it is not so exactly. Social behavior is adequately irregular and unpredictable. Personal whims and moods supersede the actions of human beings that we can never be quite sure what they would do under certain given circumstances. As human behavior is not uniform and uncertain so, we cannot foretell in advance.

Arguments Against-

i) It can be regarded as true that if the behavior of an individual cannot be predicted but the behavior of an entire group can surely foretold with adequate exactness.

ii) It is difficult to predict about the causes of social events. So, Social sciences like notably Sociology can make predictions the future of a happening in advance our social relationships on the basis of cause-effect association. If any sort of disturbances in family becomes pronounced, it can make predictions in relation to the number of divorces, use of drugs, and peer group influence etc. Discovering its cause-effect association, it can determine 'what will be' on the basis of 'what is'.

iii) Predictability is difficult in case of social sciences, but it is not impossible entirely. So there is ample scope in it. As more and more scientific methods of studying social phenomena are available, there will be more progress in the direction of prediction about them. The social engineer will be able to predict more exactly as he may control the circumstances governing social relationships

4.3.3: Subjectivity and Intangibility:

The physical phenomena can be identified through our senses directly whereas social phenomena as traditions, customs, attitude, values and the whole realm of so called subjective world which is doubtful. Due to lack of ample objectivity the verification appears rather so difficult. It is difficult to say that all persons may see all those subjective things which manifest at an abstraction level like customs, traditions and values in the similar lens.

Arguments Against:

- i) Certain techniques now have been evolved to measure most of the so called subjective things in an objective manner. For Example- measurement of body, nose, bones, and skull etc. This is so exactly even in a behavioral science like Anthropology.
- ii) Abstract things like tradition, customary behaviour and feelings have become sufficiently standardized that all people understand them in the same manner.

4.3.4: Dynamic Nature of Social Phenomena

Most of the physical sciences deal with inanimate things like oil, wooden material, soil, water, chemicals etc. All those physical things do not change much over time. There are observer and the observed, the researcher and the matter can be clearly distinguished.

In case of human beings, it is not accurately so. It is ever changing to a great extent. Therefore what was the true of the past may not remain intact for the sake of present and future situation. The researcher has to suggest that what can be the remedy for the present type is not for the future or past. Due to dynamism of societal realities, it becomes rather difficult to do so. For Instance, fashion may change over times during the course of a single fashion survey itself. Group behavior, again, is changing continuously. Behavior on the individual plane cannot be easily visualized. Very often we may observe sudden and abrupt change in individual and group behavior. Therefore, as compared to physical phenomena, social phenomena are not stable and consistent in nature.

Complete universality is only a myth and is rarely obtained in behavioral sciences. This is chiefly so due to heterogeneous nature of social phenomena. Universality is there to be found in physical sciences due to the homogeneity of basic qualities which is very difficult to ascertain while studying of social phenomena. Universality in real sense in case of the laws of social sciences thus means a limited universality and they are only true under specific conditions.

Arguments Against:

Apparently this seems as a valid reason. But it is not perfectly so. Although human beings are changing, becoming more intelligent and wise through experience. Still there is fundamental instincts remain unchanged. Basic nature remains the same and as a result facilitates the research.

4.3.5: Interdependence of cause and effect

In case of a social phenomenon, the cause and effect are interdependent and one stimulates the other which is evident in the association between unemployment and poverty. It is therefore very difficult to ascertain what the cause is and what is the effect and as the cause appears to be the effect at times and vice-versa also which is not so in concrete physical sciences.

For example - Poverty is associated with criminality. Here if poverty is construed as the cause of criminality also vice versa can be understood. So, it is a herculean job to

distinguish between poverty and criminality i. e cause and effect or as an independent variable and dependent variable. But this is not to be found in natural sciences.

Arguments Against:

In an instance- divorce and family disorganization, divorce is an effect while family disorganization is understood as a prominent reason. Thus, Sociology has uncovered a cause-effect association between the phenomena of divorce and family disorganization. In similar lens, Sociology sees and examines cause effect association in social disorganization and other intended issues and entities in a given society.

Above reason seems valid. But we now may take another case – “”Are low wages a cause of poverty”? Yes. But it is not poverty a cause of low wages? MacIver sums in the end that unless we realize this fact we will be asking wrong questions and finding wrong answers.

4.3.6: Difficulty in the Use of Experimental Method

Most of the physical sciences can be put and subjected to laboratory test under specified conditions. The deductions are more accurate and universal that they can be tested at any time.

In case of social sciences such a facility is completely lacking. We can never hope to put human beings to laboratory test. Even if it is done, their responses would not be natural. In the similar lens, religion cannot be put into a laboratory for experimental purpose.

Arguments Against:

Above argument is although correct but not in absolute forms. There are some physical sciences like astronomy cannot be put into laboratory situation, but everybody can regard it a place of definite science. Now some branches of social sciences too (psychology, psychiatry etc.) Instruments have been devised for testing brain wave intelligence etc.

4.3.7: Lack of Homogeneity

It is genuinely assumed that no two persons are similar and for which the conclusions derived from the study of any single case may not be understood in some other cases. There is no ambiguity that the nature of homogeneity is much meager in societal phenomena case in comparison to all those natural sciences.

Arguments Against:

But the fact to which we all may agree that any two persons are not quite different from one another. Now this case has been thoroughly studied and proved that

conclusions on group behavior and psychology of a whole group are not just with less significance. These cases are found to be taken for granted substantially. Though two people are not similar accurately in all attributes, but basic pattern under particular situations remains intact. It is certainly feasible to categorize some persons on the basis of common traits in a definite way that there is unambiguously a high degree of resemblance among the different types of group.

Henry Ford has added much in this regard that any two motor vehicles if they are found to be similar in configuration, but having road habits differently. In this way it's not adequate to say that due to lack of homogeneity, scientific method cannot be applied in studying social phenomena. So more importantly, it's here pertinent to mention the remark of Lundberg that if two persons are not similar in their perception, behavioral responses, attitude, and even way of life, certain techniques must be devised to study them. He has also said that even in medical sciences, no two cases are accurate, but the methods being used are consistent in other different case studies.

4.4 LET US SUM UP

Social sciences primarily deal with the behavioral aspects of human beings, which is, by and large, complex and dynamic in nature. One cannot, therefore investigate under conditions as in physical sciences. This emanates numerous problems for the researcher like the problems of subjectivity and individualistic generalizations etc.

The problems coming out of the content as well as nature of social sciences do not seriously diminish the importance of scientific method for social researchers. Notwithstanding the inherent limitations of social sciences, scientific method can be positively acceptable along with its own shortcomings for the study of social phenomena.

It is thus conclusively proved that the various arguments assuming sociology outside the boundary of science is enough incapable of being dealt through scientific method do not illuminate much relevance and significance.

Lundberg says – “the difficulties therefore which appears to prelude the possibility of a true science derive from our underdeveloped technique and methodology of study and our consequent unfamiliarity with the data rather than from inherent differences in the data themselves.”

But, it is worthful and relevant to note that tendency towards the use of scientific method is fast growing in sociological research and in near future perfect laboratory technique like other physical sciences may be developed.

It is crystal clear from the foregoing discussions on Social sciences or sociology that in Social sciences particularly in Sociology, research endeavor with the use of scientific methods is possible but at an abstraction level. The laws of these abstract forms can determine what would be the consequent reactions of concrete things. In this way the laws of Sociology are effectively verifiable and universal generalizations can be made feasible. Sociology always seeks to uncover cause-effect relations in social, educational, industrial, religious, family structures, including other social facts. Sociology as a science has witnessed a revolutionary change in man's assumptions and also has paved the way hopefully for a future of social harmony in human society.

4.5 GLOSSARY

Subjectivity – The attribute of being based on or influenced by personal feelings, preconceived ideas. For instance when an investigator wishes to study purdah system prevalent in Muslim community, his research conclusions may be biased with a greater possibility.

Intangibility- Which is something persists at a latent form not being explicit like an physical object (chalk, Blackboard, water, soil) such as love, affectivity, anxiety, and hate etc.

Social Phenomena- This is something prevails as it is concerned with an individual's observable behavior that influences another individual. For Example- Caste system or Casteism is a social phenomenon because it is an ideology that people have created out of their increased interaction.

Homogeneity- the quality of being the same type or kind which is reverse to heterogeneity

Complexity- Lacking an order or a patterned relationship in a phenomena due to dynamism

4.6 CHECK YOUR PROGRESS-ANS KEYS

Activity-1: 'The subject matter of social science is more complex than the subject matter of physical science'. Justify this statement with your own viewpoints with suitable instances

Activity-2: Bias and Cultural stereotypes are less impacting factors in physical sciences in comparison to Behavioral sciences. Elucidate this Proposition with proper instances drawing a demarcation between these two different sciences.

Activity-3; what are the limitations with regard to the application of scientific method in case of social science research? Give your own comments from your understanding.

Activity-4: Is Scientific method truly applicable while studying any social phenomena?

Activity-5: Scientific method is more compatible with natural science than a behavioral science, elucidate.

Activity-6: What are the discrepancies between a natural phenomenon and a social phenomenon?

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