



## RESEARCH METHODOLOGY - AN INTRODUCTION

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### **Abstract:**

Research is a continuous and dynamic process. Research is systematically collecting, analyzing, and interpreting data to answer a specific question or solve a problem. Research is a movement from the known to the unknown. It is a voyage of discovery unfolding truth by systematic scientific search for pertinent information on a specific topic. Research is considered a formal, systematic, and intensive process of fact-finding, experimentation, analysis of data, and arriving at valid conclusions. Research starts with a problem. Then, it is followed by collecting data or facts, critical analysis, and decision-making based on the evidence. Research seeks explanations for unexplained phenomena, clarify doubtful facts, and correct misconceived facts.

**Key Words:** Research, Natural Science and Social Science Research, Functions of Research, Objectives of Research, Descriptive vs. Analytical, Applied vs. Fundamental

### **Introduction:**

The word 'research' originates in the French word 'recherche'. According to Webster's dictionary, research means 'Diligent inquiry or examination in seeking facts or principles'. One way of arriving at the meaning of the word is to bifurcate it as 're' and 'search' which means to search again and again, obviously to find out something new. This 'something new' can be found out based on new data or analysis of existing data. Rusk defines research as a point of view, an attitude of inquiry of a frame of mind. Monroe defines it as "a method of studying problems whose solutions are to be derived partly or wholly from facts. The facts dealt with in research may be statements of opinion, historical facts, those contained in records and reports, the results of tests, answers to questionnaires, experimental data of any sort, and so forth". It may be observed that this definition of research elaborates on the research process. In the words of Best, "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 a formal record of procedure and a report of result or conclusions."

Thus, research is a procedure for searching and presenting knowledge on various problems by enquiring using scientific methods. Lundberg says, "Research is sufficiently objective and systematic to make possible classification, generalization, and verification of data observed." In the Encyclopedia of Social Sciences, McMillan defines research as "a critical and exhaustive investigation of experimentation having as its aim the revision of accepted conclusions in the light of newly discovered facts."

The above definitions highlight the research's basic concepts, characteristics, processes, and outcomes. These can be summarized as follows:

- Research is a way of thinking which involves questioning.
- Research is goal-directed, wherein solutions to the problems are expected.
- It generates theories and hypotheses for further investigations.
- It is based on data collection through various methods such as observation, survey, experimentation, etc.
- Data collected is analyzed and interpreted to generalize findings.
- Research strives for objectivity and logic and tries to adopt scientific Methodology.
- It requires dedication, intelligence, an inquisitive mind, and honesty on the part of researchers.
- It is conducted systematically.
- It must be reliable.

The phenomenon of research can be understood through some examples. Sir Isaac Newton's investigation of why objects fall to the earth and the resultant theory of gravity or Einstein's postulation of the Theory of Relativity are classic examples of research. At a less fundamental level, suppose that in a class, even after hard work by the teacher, students are not performing well. The teacher may wonder why it is so. This could be a topic of inquiry and research. Or, in the same classroom situation, two groups of students with similar intelligence do not perform equally well in examinations. Is it because of the differences in their socio-economic backgrounds and psychological profiles? This may be an issue for research. The government may be spending large sums of money on a program for creating employment for the unemployed youth. There are doubts in the

public mind that the money is not spent correctly and the program's results are not encouraging. This, again, is a situation when research is called for to evaluate the program's impact on employment.

#### **Natural Science and Social Science Research:**

The examples of research given in the previous paragraph would suggest that analysis is not confined to any particular field. It can be questions relating to physical, natural, or social sciences. Physical sciences cover physics, astronomy, and chemistry; biological sciences relate to botany and zoology; and social sciences include fields such as anthropology, sociology, psychology, history, economics, political science, etc. Research can be in applied sciences like engineering, technology, medicine, and interactions between science and society.

Natural science research generally relates to researches in pure sciences such as physics, chemistry, botany, etc., while social research relates to phenomena and problems in human society. The primary research philosophy to observe phenomena, theorize based on such observations and test and validate the theories is common to both. However, a fundamental difference between the two is that physical science or natural science research relates to things and objects that can be experimented upon in labs. In contrast, social research relates to human behavior generally observed in the natural environment and not in laboratories. This book is concerned with social science research.

Social science research refers to scientific investigations into the phenomena and patterns observed in society and social relationships. How different are the living designs in various cultures, why people behave in a particular manner, how these behavioral patterns change in different situations, how, based on specific facts of the present, societies of the future will emerge, and so on are some of the questions that come under the discipline of social science research. Ragin defines social research as "the interaction between ideas and evidence. Ideas help social researchers make sense of evidence, and researchers use evidence to extend, revise, and test ideas". Prof. C.A. Moser writes, "Systematised investigation to gain new knowledge about social phenomenon and surveys, we call social research."

In the words of Mary Stevenson, "Social research is a systematic method of exploring, analyzing and conceptualizing social life to extend correct or verify knowledge, whether that knowledge aids in the construction of a theory or the practice of an art." P.V. Young explains social research as "a scientific undertaking which through logical and systematized techniques aims to discover new facts or verify and test old facts, analyze their sequences, interrelationships and casual explanation which were derived within an appropriate theoretical frame of reference, develop new scientific tools, concepts, and theories which would facilitate the reliable and valid study of human behavior." Rummel has given a short definition of social research: "It is devoted to a study of mankind in this social environment and is concerned with improving this understanding of social orders, groups, institutions, and ethics."

#### **Functions of Research:**

Research generates new knowledge in natural and physical sciences or social sciences. It explores new theories and validates the older ones. Apart from promoting understanding of things, processes, and phenomena and satisfying humankind's thirst for more and more knowledge, research results bring innumerable direct benefits to society. Advances in medical sciences come to one's mind immediately in this context. Results of scientific research in other fields have effectively promoted human development. Social science research is an essential tool for policy planning and evolving programs for social development. It can lead to making social services more adequate and effective.

#### **Objectives of Research:**

Research aims to discover answers to questions by applying scientific procedures. The study aims to find the hidden truth that has not yet been discovered. Though each research study has its specific purpose, we mention the general objectives of the research below:

- To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed exploratory or formative research studies);
- To portray accurately the characteristics of a particular individual, situation, or group (studies with this object in view are known as descriptive research studies);
- To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studios);
- To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

#### **Types of Research:**

The basic types of research are as follows:

##### **(i) Descriptive vs. Analytical:**

Descriptive research includes surveys and fact-finding inquiries of different kinds. The primary purpose of descriptive study is to describe the state of affairs as it currently exists. In social science and business research, we often use Ex post facto research for descriptive research studies. The main characteristic of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening. Most ex post facto research projects are used for descriptive studies in which the researcher seeks to

measure such items as, for example, frequency of shopping, preferences of people, or similar data. Ex post facto studies also include attempts by researchers to discover causes even when they cannot control the variables. The research methods utilized in descriptive research are survey methods of all kinds, including comparative and correlational methods. In analytical research, on the other hand, the researcher has to use facts or information already available and analyze these two to evaluate the material critically.

**(ii) Applied vs. Fundamental:**

Applied research aims to solve an immediate problem facing a society or an industrial/business organization, whereas fundamental research is mainly concerned with generalizations and formulating a theory. Gathering knowledge for knowledge's sake is termed fundamental research. Research on some natural phenomenon or pure mathematics are basic research examples. Similarly, research studies concerning human behavior carried on to make generalizations about human behavior are also examples of fundamental research. However, research aimed at certain conclusions facing a concrete social or business problem is an example of applied research. Research to identify social, economic, or political trends that may affect a particular institution, marketing research, and evaluation research are examples of applied research. Thus, the central aim of applied research is to discover a solution for some pressing practical problems. In contrast, basic research is directed towards finding information with a broad application base, thus adding to the already existing organized body of scientific knowledge.

**(iii) Quantitative vs Qualitative:**

Quantitative research is based on the quantitative measurements of some characteristics. It applies to phenomena that can be expressed in terms of quantities. Qualitative research, on the other hand, is concerned with qualitative phenomena, i.e., phenomena relating to or involving quality or kind. For instance, when we are interested in investigating the reasons for human behavior (i.e., why people think or do certain things), we often talk of "Motivation Research, an essential type of qualitative research. This type of research aims to discover the underlying motives and desires, using in-depth interviews. Other techniques of such research are word association tests, sentence completion tests, story completion tests, and similar projective techniques. Attitude or opinion research, i.e., research designed to determine how people feel or think about a particular subject or institution, is also qualitative research. Qualitative research is vital in the behavioral sciences, where the aim is to discover the underlying motives of human behavior. Through such research, we can analyze the factors that motivate people to behave in a particular manner or make people like or dislike a specific thing. However, it may be stated that applying for qualitative research in practice is a relatively challenging job. Therefore, while doing such research, one should seek guidance from experimental psychologists.

**(iv) Conceptual vs. Empirical:**

Conceptual research is related to some abstract idea(s) or theory. It is generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones. On the other hand, empirical research relies on experience or observation alone, often without due regard for system and theory. It is data-based research. Coming up with conclusions that can be verified by observation or experiment. We can also call it an experimental type of research. In such research, it is necessary to get facts at their source and actively do certain things to stimulate the production of desired information. The researcher must first provide a working hypothesis or guess the probable results in such research. He then works to get enough facts (data) to prove or disprove his theory. He then sets up experimental designs to manipulate the persons or the materials concerned to bring forth the desired information. Such research is thus characterized by the experimenter's control over the variables under study and his deliberate manipulation of one of them to study its effects. Empirical research is appropriate when proof is sought that certain variables affect other variables somehow. Evidence gathered through experiments or empirical studies is the most potent support for testing a hypothesis.

**Research Approaches:**

The above description of the types of research brings to light that there are two basic approaches to research, viz., the quantitative approach and the qualitative approach. The former involves generating data in quantitative form, which can be subjected to rigorous quantitative analysis formally and rigidly. This approach can be further sub-classified into inferential, experimental, and simulation methods to research. The inferential approach aims to form a database to infer characteristics or relationships of the population. This usually means survey research, where a population sample is studied (questioned or observed) to determine its parts, and it is then inferred that the population has the same features. The experimental approach is characterized by much greater control over the research environment, and in this case, some variables are manipulated to observe their effect on other variables. The simulation approach involves the construction of an artificial environment within which relevant information and data can be generated. This permits observation of the dynamic behavior of a system (or its sub-system) under controlled conditions; the term 'simulation' in the context of business and social sciences applications refers to "the operation of a numerical model that represents the structure of a dynamic process. Given the values of initial conditions, parameters, and exogenous variables, a simulation is run to describe the behavior of the process over time. A simulation approach can also be helpful in building models for understanding future conditions.

A qualitative approach to research is concerned with the subjective assessment of attitudes, opinions, and behavior. Research in such a situation results from the researcher's insights and impressions. Such an approach to research generates results either in a non-quantitative form or in a form that is not subjected to rigorous quantitative analysis. Generally, focus group interviews, projective techniques, and in-depth interviews are used.

**Conclusion:**

According to Cook, "Research is an honest, exhaustive, intelligent searching for facts and their meanings or implications about a given problem. It is arriving at dependable solutions to problems through planned and systematic data collection, analysis, and interpretation. The best research is reliable, verifiable, and exhaustive, providing information in which we have confidence."

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