

## **RESEARCH METHODOLOGIES AND THEIR PRACTICES**

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### **Abstract:**

*In common research means search for knowledge. We can also say research is finding solution to a problem or contributing to the existing stock of knowledge in a systematic way with the help of study, observation, comparison and experiment. Research methodology is the systematic way to find the solution to the problem scientifically. Research methodologies provides the students the way or the technique to gather data by observation, using statistics, questionnaires, comparison, experiment and interpreting it to get the result.*

*The paper highlights the various research methodologies and their practices in different sectors. The paper also highlights the difference between research methods and research methodologies. The paper starts with the introduction of research. In addition to that the objectives, motivation, various types of research and significance of research methodologies and their practices in different sections are discussed. The main purpose of this paper is to highlight the various research methodologies and their practices throughout the study in different sectors.*

### **Keywords:**

*Research, Research methods, Research methodologies.*

### **Introduction:**

#### **Meaning of Research:**

To do research is to search for knowledge. The word Research comprises two words Re which means again and the word search means to find or to investigate systematically. In order to establish new facts and find a solution to the problem or to reach a new conclusion by systematically studying or investigating the materials is known as research.

We can also say it is the journey of discovering new facts by systematically discovering the problem, formulating the hypothesis, collecting the data related to the problem, analysing the data and then reaching a conclusion by generalisation or formulation of theory.

Good research is always systematic and logical. It should clearly define the concept so that repetition of the research is not done by the researcher.

### **Objectives of Research:**

The main aim of research is to find out the hidden truth or find answer to the question systematically which are yet to be solved or discovered. Research is also done to contribute or make advancement with knowledge to the existing stock of knowledge.

Apart from this Research is also done to gain familiarity by formulative research study. To highlight the characteristics by descriptive research. To find out the frequency of the research problem by diagnostic research study.

To test a hypothesis between variables by clearly identifying the variables to be measured by hypothesis research study.

Research objectives focuses on the topic of the study by clearly identifying the variables to be measurable.

### **Motivation in Research:**

There can be different motives to do research. It can be either to get a research degree and get respectability or to provide service to the society. It can be either to find a solution to an unsolved problem or to do some different and creative work.

### **Types of Research:**

- Descriptive research
  - The other name of descriptive research is Ex post facto research. Under such research the studies are in description form and there is no control over the variables.
- Analytical research
  - Under such research studies, the researcher uses information which is already available.
- Applied research
  - The research to discover solution to the immediate and pressing problem faced by any society or any organisation is known as Applied research.
- Fundamental research
  - The research to make generalisation and establish new facts are known as fundamental research. It is related to natural phenomenon or pure mathematics.
- Quantitative research
  - Quantitative research is applied on the research which are based on quantity.
- Qualitative research
  - Qualitative research is based on Qualitative phenomenon. The main aim of such research is to find out underlying motives of human behaviour. The research to find out what is the opinion of the people in particular subject i.e., opinion research or Study about the human behaviour i.e., motivation research are examples of qualitative research.

- Conceptual research
  - The research to develop new concepts or add new ideas to the existing ones is known as Conceptual research.
- Empirical research
  - Empirical research is based on experience or observation. Under such research hypothesis is formulated first and then the research process continues to accept or reject the hypothesis.

### **Significance of research:**

Research plays an important role in applied economies which has greatly increased in modern times. Not only this research plays a significant role in all governmental policies in our economic system. Various operational and planning problems related to business and industry are solved by undertaking various operational research, market research, as well as motivational research. Research plays a significant role in generalisation and formulation of new ideas and theories. It also plays an important role for social scientist to find answers to their various social problems.

### **Research Methods verses Research Methodology:**

The main difference between Research Method and Research Methodology is that the method used in the process of research is known as Research Method. We can also say the various methods used to solve a research problem is known as Research method whereas the systematic way to solve the research problem is known as Research Methodology. Both Research Method and Methodology play a vital role in the process of research. The scope of research methodology is wider than the scope of research method. We can also say research method is a part of research methodology. Research method consist of procedure or method to collect primary and secondary data, use the different statistical methods to establish hypothesis and to evaluate the accuracy to solve the research problem. Whereas research methodology consists of the way how a research problem is to be defined and hypothesis formulated. It also includes the way to what data to be collected and what procedure to be involved to analyse the collected data to solve a particular research problem.

### **Research Methodology:**

The various steps of research process in a prescribed sequence and their brief description are discussed:

**A. Formulation of research problem:** First and foremost, step is to decide the area or the subject matter which the researcher would like to study or inquire. The researcher needs to understand the research problem and find out the gap to be investigated or studied. The research problem can be understood better by discussing it with the guide who can be an expertise in the particular field. Research problem can be of different types. It can be theoretical, descriptive, applied, causative, action etc. The researcher should select a research problem of which the solution is to be obtained and then define the problem ambiguously. Thus, defining a research problem is an important step as it helps in smooth research process.

- B. Literature review:** After the formulation and defining of research problem properly a synopsis is submitted to the research board proceeding with a literature survey related to the research problem. For literature review different published and unpublished journals, books, reports, research library sites such as shodhganga, ResearchGate, Google Scholar, conference proceedings etc must be carefully studied. By literature survey a researcher finds the gap in the previous studies related to the research problem.
- C. Formulation of hypothesis:** After literature survey related to the research problem, a researcher should draw out an assumption or hypothesis of the problem on which the researcher has to investigate and find solution or establish fact. It is an overview of the subject which indicates the type of data to be collected and type of research method to be used in the research process. A hypothesis makes the study narrow by guiding the researcher to focus on the area of the research problem. A hypothesis should be clearly defined and in prescribed form to draw reliable inference. Scope of hypothesis should be limited and specified. It should be in simple and easy terms. Hypothesis formulated should be capable of being tested in reasonable time. Hypothesis plays an important role in most research problems except formulative researches in which no hypothesis is formulated and tested.
- D. Research design:** Research design is the formulation of the design of the project in advance for the relevant working of the research process. It is a brief outline of how the data is collected, measured and analysed yielding maximum information. Research design should be prepared with great care as it may provide misleading conclusions. A good research design should be flexible, efficient, provide maximum information with minimum expenditure and should be related to the objectives and nature of the related problem. Different research designs are formulated for different research study i.e., for descriptive, exploratory, hypothesis testing, experimental or casual study.
- E. Sample design:** A brief plan of collection of samples from the population is known as sample design. The selected data from the population is known as sample and the process to collect the data is known as sampling technique. There are different types of sample design. The researcher selects the sample design which is related to his research study. Sample design can be on the probability or non-probability basis. Simple random sampling, systematic sampling and cluster sampling are probability sampling. Quota sampling, deliberate sampling, sequential sampling, multistage sampling and convenience sampling are nonprobability sampling.
- Simple random sampling- Simple random sampling is a probability sampling in which samples are selected in a random way from the set which have the equal probability. Therefore, it is also known as chance sampling or probability sampling.
  - Systematic sampling- It is a probability sampling in which the samples are selected from the population at a regular interval. In this method every nth element is selected from the random point till desired point is reached.
  - Cluster sampling- It is a probability sampling in which groups or clusters of samples are selected randomly from the population. Cluster sampling is helpful in increasing the efficiency of the fieldwork.
  - Quota sampling- It is a non-probability sampling and is also known as stratified sampling. It is the method in which samples are selected non- randomly.
  - Deliberate sampling- Deliberate sampling is a non-probability sampling which is also known as purposive sampling. It is the process of selecting samples on the basis of ease of access.

- Sequential sampling- Sequential sampling is a non-probability sampling. In this sampling method the size of the sample is not determined in advance but it is determined according to the situation to reach the desired conclusion.
  - Multistage sampling- Multistage sampling is a complex form of cluster sampling. In this sampling method the entire population is divided into different stages of smaller and smaller groups for conducting research.
  - Convenience sampling- Convenience sampling is a non- probability sampling in which samples are drawn from the population which is conveniently available.
- F. Data collection:** After the formulation of research problem, hypothesis, research design and sample design the method of collection of data begins related to the project. Two types of data are collected by the researcher i.e., primary data and secondary data. Primary data are the original data which are collected for the first time from the source itself. Primary data are collected by observation, by interview, by questionnaire or by schedule. Secondary data are the data which are already collected. Such data are collected from published information from different sources.
- G. Execution of project:** It is one of the major steps in research process. Execution of project involves steps to ensure the research process is in systematic manner and is under statistical control so that the collected information is adequate.
- H. Data analysis:** After the collection of data, the collected data are analysed through editing, coding, classifying and tabulation. Sometimes the data collected are not uniform. In order to detect the errors in the collected data editing is carefully done to the collected information so that accurate and uniform data is available. Coding is translating the given data into numerical values in which code book gives a numerical code to each data for data analysis. After the data are edited and coded it is put in tabulated form to undergo statistical analysis and find out the trend and comparable relationship of the data.
- I. Hypothesis testing:** After the data has been collected and analysed it's time to test the validity of proposition i.e., the hypothesis which is formulated earlier. Applying various test i.e., Chi square test, t-test, F-test the researcher finds out whether the hypothesis is accepted or rejected. The first step under hypothesis testing is to formulate null hypothesis and alternative hypothesis. Test can be either one-tailed test or two- tailed test. After that hypothesis is tested at 5% or 1% level of significance depending upon the size and measurement of samples. Next step is to determine the sampling distribution which could be normal distribution or t-distribution. The selected sample is then computed under appropriate statistical test. Calculation of probability is a major step which supports the final step to compare the probability to decide whether the null hypothesis or the alternative hypothesis is accepted. In case of one-tailed test null hypothesis is rejected and alternative hypothesis is accepted if the calculated probability is equal to or less than the specified value of alpha. Whereas null hypothesis is accepted if the calculated probability is greater than the value of alpha. Type I error is committed if the null hypothesis is rejected whereas Type II error is committed if the null hypothesis is accepted.
- J. Generalisation and Interpretation of data:** After hypothesis testing the researcher draws inferences from the collected fact and builds a theory by reaching certain conclusion or generalisation. In case no hypothesis is formulated findings are based on some theory which is known as interpretation which may result in arising new questions for further researches.

**K. Report of the study:** Research study is incomplete without a research report, it is considered as the major component. Hence the final step is the preparation of the report by the researcher which must be done with great care. To prepare a research report firstly the subject matter is analysed and then the final outline and rough draft is prepared which is revised and polished for the preparation of final bibliography and for writing final draft. A research report can be of technical report or popular report. A research report comprises preliminary pages, main text and end matter. The preliminary pages include the title of the project, and acknowledgement whereas the main text includes the introduction, the main body, the findings and the conclusion and the end matter includes the appendices, bibliography. A good research report should be complete, clear, logical and in simple language. It should be accurate with no repetition of data and free from grammatical mistake. The objectives of the study should be clearly defined. The report should not be dull but should be attractive to sustain reader's attention.

### **Conclusion:**

Research methodology play a vital role in research process. It creates a proper guideline for the research to be conducted to establish new facts without any error. Many researches are done every year but little attention is paid towards research methodology due to which futile results are obtained. Therefore, to improve the quality of research attention should be paid towards the systematic way or technique to conduct the research process and find solution to the research problem.

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