



Research Methodology: A Scientific Tool for Research Work

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Abstract: When doing research, it's important to know how to do it methodically. It may be described as the study of how scientific research is really carried out. Investigating a study issue involves going through a number of stages, each with its own set of assumptions and rationales. The researcher must be well-versed in both the research methodologies and procedures and the strategy. Researchers must not only know how to compute the mean, mode, median, standard deviation, or chi-square, but they must also know which of these methods or approaches are important and which are not, and what they signify and signal, in order to be successful in their study. Understanding the assumptions and criteria for determining whether methods and processes are appropriate for a given problem is also critical for researchers. This implies that the researcher must develop a technique specific to his or her issue, since the same may vary from problem to problem.

Key Words: Research Methodology, Research Methods, Qualitative research, Quantitative Research, Hypothesis, design.

1. METHODOLOGICAL APPROACH:

A methodological approach comprises a sequence of acts or processes essential for doing research successfully. These are the acts or steps; (i) Identification and Formulation the Research Problem (ii) Literature Review Regarding Research Problem (iii) Construction of Hypothesis (iv) Research Design (v) Data Collections Tools (vi) Analysis of Data (vii) Hypothesis Testing (viii) Result (ix) Conclusion.

1.1. Identification and Formulation of Research Problem: Identification of research problem is very important because the research process depends on the selection of problem. How to identify the problem, its depends upon sources. From different sources u can identify the problem, we can see in detail as from your personal experience you will get research problem, your day-to-day experience, next is practical experience and its depends on your job and city, critical review of literature as u are reading books, articles, magazines or through internet If researcher selecting wrong topic, then research is of no use, so the success of your research study depends upon the identification of the problem. Following identification, the most critical phase in the research process is the framing of the research issue. It's similar like deciding on a destination before embarking on a trip. Without a well-defined research issue, developing a well-defined strategy is difficult. Although it may not look so, developing a research issue is a challenging undertaking. To begin, the researcher should examine publications published in the existing body of knowledge on the issue and consider how the techniques and concepts mentioned may be used to the formulation of a new challenge. The researcher should make contact with an expert who is already doing this kind of study. A research guide may be of use in this regard. When picking a research issue, the researcher should keep the following aspects in mind:

- The topic chosen for study should be known and realistic, allowing for easy access to relevant research materials or sources of information.
- Time factor, money factor and few other points should be in the mind of researcher.

2. LITERATURE REVIEW REGARDING RESEARCH PROBLEM: Once the researcher has defined the issue, he or she should do a thorough literature search on the subject. Academic publications, conference proceedings, government reports, and novels, among others, must be accessed for this purpose.



2.1. Construction of Hypothesis: The working hypothesis or hypotheses should be stated in straightforward language after a review of the literature. When a hypothesis is expressed as a working hypothesis, it's meant to be tested to see whether it holds up to scrutiny. It's vital, or at least it's the focal focus of the investigation. Presumption based on the premise that if the results of a hypothesis are well-established truths, then the hypothesis must be true or has a high probability of being correct. J.S., a. "A hypothesis is a tentative generalisation whose truthfulness must be verified." At its most basic level, a hypothesis might be any intuition, guess, or creative notion that serves as the foundation for future inquiry." Lundberg. There are several factors to consider while developing a hypothesis, since they are critical for successful verification.

- A hypothesis should be straightforward, specific, and conceptually straightforward. There is no room for ambiguity in the formulation of hypotheses, since ambiguity makes verification almost difficult.
- A hypothesis must be verifiable, which means that data collecting, and analysis methods and procedures must be accessible.
- The theory should be connected to an existing issue.
- A hypothesis should be operationalizable, that is, it should be represented in quantifiable terms. If something is not quantifiable, it cannot be tested, and hence no conclusion can be formed.

3. RESEARCH DESIGN:

"Research design" is the term used to describe the process of creating a plan for a research project. A study's framework or plan, known as the research design, acts as a road map for gathering and analysing data. It serves as a guide for completing a piece of research. The research design serves as the blueprint for data collecting, measurement, and analysis. Indeed, it is a road plan that is often prepared to direct the investigation. Following the formulation of hypotheses, we must develop a research design, in which we define the conceptual framework within which the study will be done. Research can be as efficient as possible while getting as much information as possible via the construction of this concept. To put it another way, the goal of research design is to make it as easy as possible to gather relevant data, time, and money. This depends on the study's goal, however, and how it may be achieved varies greatly.

3.1. Data Collection Tools: The data gathering process starts once a research challenge has been determined and a research strategy has been mapped out. In terms of cost, time, and other resources accessible to the researcher, there are a wide range of data gathering methods. Data gathering techniques that are used most often include experiments and surveys. One or more of the following methods may be used to collect data for a survey: (i) by observation, (ii) through personal interview, (iii) through questionnaires, (iv) through a predetermined timetable. Qualitative and quantitative researchers may both benefit from many of the same data collection methods. A researcher's independence, structure, sequential order, depth, and flexibility are all affected by the limits put on the research process. These limits favour quantitative tools, whereas qualitative approaches reject them.

3.2. Analysis of Data: For data analysis, a number of interrelated activities is required. These include creating categories, applying those categories to raw data, and then making statistical conclusions. Analysis work is generally focused on calculating different percentages, coefficients, and other statistics using different well-defined statistical equations once the tabulation has been completed. Throughout the data analysis process, any relationships of differences supporting or opposing the original or new hypothesis should be tested for significance. There are several quantitative and qualitative procedures that fall under the umbrella of data analysis. In behavioural research, quantitative analysis and statistical methods and techniques are often used. Statistical methods and procedures are used. Statistical approaches and procedures have a unique place in research because they help solve difficulties. The primary roles of data analysis are as follows: (i) The researcher should analyse the available data in order to determine the validity of the issue statement. (ii) The researcher should analyse the available data in order to test each of the problem's hypotheses. (iii) The researcher should check the original data records before undertaking any data analysis. (iv) The researcher should analyse the data in order to get a layman's perspective on the study subject. (v) The researcher should conduct an analysis of the data by using statistical calculations. (vi) To properly analyse the data, the researcher must take into account the relevance of the tables that the data provided permits.

3.3. Hypothesis Testing: Once the data have been analysed, the researcher may test any hypotheses he may have developed in the past. Is the evidence in favour of the hypothesis, or does it not support it? The 't' test, the 'F' test, and others must all be used to determine the answer to this common question. This is why statisticians came up with the F



test. A hypothesis may be accepted or rejected based on the results of a hypothesis test. Generalizations based on facts may be made if the researcher does not begin with a hypothesis.

4. RESULT:

After testing and confirming a hypothesis multiple times, the researcher may be able to reach generalisation, i.e. construct a theory. Indeed, research's ultimate worth is in its ability to develop generalisations. The researcher may use some theory to try to explain the facts if he or she starts off with no hypothesis. This is referred to as interpretation.

Finally, the researcher must write a report summarising his work. The researcher verifies the outcome. After obtaining the results, the researcher compares them to those of previous researchers or, in other words, the researcher produces the conclusion to his investigation. Conclusions should be restricted to those that are warranted by the research's findings and to those for which the data give a sufficient foundation. After the reader has done reading the document or paper, the conclusion is designed to assist them comprehend why your study is important to them. A conclusion is not just a recap of your arguments or a restatement of your research topic; it is a synthesis of critical ideas.

5. CONCLUSION:

All the above methodical approaches shows that research methodology is really very helpful in research work. Research methodology tells to researcher a next step of research in the scientific way or We can say research methodology works as a scientific tool in research work.

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