Research and the Scientific Method

- Research may not be theory guided and may be based on hunches, experience and intuition. This is because sometimes the problem is so simple that it does not require elaborate research, and past experience might be necessary to offer solution.

- Scientific method on the other hand is an organized system, data-based, critical, objective scientific inquiry that focuses on solving problems using a step by step logical, organized, and rigorous method to identify the problems, gather data, analyze them and draw valid conclusions therefrom.

- Scientific method is purposive and rigorous and empirical.

- It helps the researchers to state their findings with accuracy and confidence. This helps other organizations to apply those solutions when they encounter similar problems.

- Scientific method must be theory guided, thus are referred to as applied research.

- Scientific method is based on sound **reasoning**-finding correct premises, testing and connections between their facts and assumption, making claims based on adequate evidence.

- In the reasoning process, deduction, induction, observation, and hypothesis testing can be combined in a systematic way.

Deduction and Induction research

Deduction is the process by which we arrive at a reasoned conclusion by logical generalization of a known fact. It involves moving from general to making specific conclusion. *For example it is known that all high performers are highly proficient in their jobs. If peter is a high performer, we can conclude he is highly proficient in his job*

Induction is a process where we observe certain characteristics of phenomenon and on the basis of these characteristics, we arrive at conclusions. In induction we logically establish a general proposition based on observed facts and characteristics.

Inductive logic follows a trail, picking up clues that lead to the end of an argument. It entails looking for traits or reasons that lead to conclusion.

For instance:

1. *I loaned my friend sh. 5000 in November and he refused to pay*

2. *I loaned him another sh. 5000 just before Christmas, which he hasn't paid back.*

will be problem solving research. In short, the main aim of applied research is to discover some solution for some pressing practical problem.

Quantitative Research

- "Quantitative research refers to the systematic empirical investigation of quantitative properties of phenomena and their relationships".
- The objective of quantitative research is to develop and employ mathematical models, theories or hypothesis pertaining to phenomena.
- The process of measurement is central to quantitative research because it provides fundamental connection between empirical observation and mathematical expression of quantitative relationships.
- Statistics is the most widely used branch of mathematics in quantitative research. Statistical methods are used extensively with in fields such as economics and commerce.
- Quantitative research involving the use of structured questions, where the response options have been Pre-determined and large number of respondents is involved.
- eg:-total sales of soap industry in terms of money value and or quantity in terms of tones for particular year, say 2008,could be researched, compared with past 5 years and then projection for 2009 could be made.

Qualitative Research.

- Qualitative research presents non-quantitative type of analysis.
- Qualitative research involves collecting, analyzing and interpreting data by observing what people do and say.
- Qualitative research refers to the meanings, definitions, characteristics, symbols, metaphors, and description of things.
- Qualitative research is much more subjective and uses very different methods of collecting information, mainly individual, in depth interviews and focus groups.
- The nature of this type of research is exploratory and open ended. Small number of people is interviewed in depth and or a relatively small number of focus groups are conducted. Qualitative research can be further classified in the following type.

i. Phenomenology:-a form of research in which the researcher attempts to understand how one or more individuals experience a phenomenon. Eg:-we might interview 20 victims of Westgate tragedy.

ii. Ethnography:- this type of research focuses on describing the culture of a group of people. A culture is the shared attributes, values, norms, practices, language, and material things of a group

Purpose of Literature Survey/Review

1. To ensure that important variables that are likely to influence the problem situation are not left out of the study
2. It sharpens and deepens the theoretical foundation of the research. Enables the researcher to study different theories related to the topic under study. Thus the researcher gains clarity and better understanding of the theoretical underpinnings of the topic understudy.
3. Create a clear picture as to what variables are most important, why they would be considered important and how they would be investigated to solve the problem. They help develop the theoretical framework and hypothesis for testing.
4. The problem statement can be made with precision and clarity
5. Testability and replicability of the findings current research are enhanced.
6. One does not run the risk of re-inventing the wheel i.e. wasting efforts into trying to rediscover something that is already known.
7. The problem investigated is perceived by scientific community as relevant and significant.
8. Help the researcher to establish grounds for critiquing the materials that have been identified as relevant by the researcher. In critiquing the existing literature, the researcher should not just focus on the findings of the previous study but should also look at the entire study including the research problem, methods, analysis and conclusions. A scholarly critique must focus on the concepts or variables in the study and also the hypothesized relationships among them.

Literature when finally composed must be closely related to the conceptual framework, the problem statement, objectives and the hypothesis. Literature review continues until the researcher concludes his work. This is to help capturing emerging issues.

Sources of Literature

In examining sources of literature, it is important to distinguish between primary and secondary sources. Primary source is a material authored by the person who made the observation of developed the ideas. They include official reports, speeches, authentic letters, eye witness accounts, original research reports, books, essays, essays and stories authored by novelists and scholars, oral interviews. They may also include artistic materials such as original paintings, music, artifacts.

Secondary source is documentation of works constructed from primary sources by a person who was not a direct observer or researcher in any of the events or studies.

The main sources of literatures may include the following sources of relevant information

- Abstracting and indexing journals
- Published and unpublished bibliographies
- Academic journals and periodicals