Chapter-One
Fundamentals of Research

- What research is & is not research
- Types of research
- Research Planning, and Research Methods

What is Research?

- Research is a scientific inquiry aimed to learn new facts, testing ideas, using a systematic collection, analysis and interpretation of data to generate new knowledge and answer a certain question or solve a problem.
- Research is carried out not only in the laboratory but also in different places/ field.
- Research is not only original and creative activity (not always discover new facts but also revise and verify the validity of previously accepted facts, theories and principles).
- Increase our understanding of the phenomenon. Research is discovering something new about the natural world, the development of new methods, systems or models.

Con’t….

- The word "research" is derived from the Latin word meaning "to know." Research is about answering questions, such as:
  - What do I want to know?
  - How do I want to gain knowledge?
  - Why do I want to know it?

What Research is?

- Research describes **what** or explains **why**
  - It is a method for finding answers to questions or a strategy for explanation
- A systematized effort to gain new knowledge; Search for (new) knowledge/facts through objective, systematic and scientific method of finding solution to a problem

What Research is not?

- Research isn’t information gathering:
  - Gathering information from books, conference papers and/or the Internet isn’t research.
  - Information gathering has no contribution to new knowledge.
- Not synonymous with commonsense,
  - but research is systematic, reproducible, objective (purposeful), relevant activity having control over some factors

How to do Research?

- Research is all about addressing an issue or asking and answering a question or solving a problem, so…
- **Select topic**: identify an issue, question, or problem.
  - Talk with people who want or need your study.
- **Review literature**: find out what's already known about it.
  - Talk with experts and/or **read their reviews** and the original research on the topic.
- **Develop research proposal**: plan, cost, and do your study accordingly.
- **Write research report and submit it for evaluation**.
  - Better still, do a good job on it and submit it for publication.
    - Your work will **benefit more people** if you publish it.

Goal of Research

- The three major goals of research are
  - defining the prevailing situation
  - analyzing & interpreting information/data, and
  - reaching new conclusions.
- The three main acts of doing research are searching for, reviewing, and evaluating information.

Qualities of Good Research

- Research is:
  - Empirical, because it is based on evidence or data
    - It provides a basis for external validity to results (validation)
  - Systematic, because it uses a method
    - It rejects the use of guessing & intuition, but does not rule out creative thinking
  - Objective, because it is presumably conducted and interpreted by the researcher without any bias
  - Controlled – Variables are identified & controlled, wherever possible

Is Research the same as Project?

- A project is where you apply the theories that you've learned to practice, where as a research goes a little beyond that.
  - you apply existing theories (you've learned) but will be coming up with new theories or concepts of your own.
  - you will have to experiment new scenario, interpret it and come up with findings in your study.
  - you cannot be certain of the result till you are done with your research

Research the same as Project

- The word **“research"** stands for a detailed study of a subject, especially in order to discover (new) information or reach a (new) understanding. It comes from French, rechercher, which means to seek out, to search closely.
- The word “**project"** stands for a planned piece of work that is designed to produce something new, or to improve something

Types of Research **Based on Purpose**: Basic and Applied Research

- **Basic research** (usually refers to fundamental research, or pure research)
  - In basic research, the researcher is testing theory and ideas without necessarily applying the results to practical problems
  - It is concerned with generalizations & formulation of theory

It is a research approach that is entirely theoretical and aimed at improving or expanding the knowledge-base of a particular field of study. It focuses on "knowledge for its own sake" and it is primarily driven by curiosity and the need to explore the unknown.

Con’t

- **Applied research** is also called field research, evaluation research, or action research
  - This type of research is conducted to find solution for problems (often immediate problems), sometimes only within one organization (hence its results are only applicable to that organization)
- It is designed to focus on providing practical solutions to a specific problem. It is a form of investigation that entails solution-oriented inquiries into a

Con’t

Examples of basic research :

- How does the human memory work?
- How do children acquire new languages?

Examples of applied research:

- A study to build students' interests in education.
- A study to improve classroom interaction between teachers and students.

Types of Research ***based on process of data***: Quantitative and Qualitative

- quantitative research deals with numbers and statistics, while qualitative research deals with words and meanings. Both are important for gaining different kinds of knowledge.
- Quantitative research is **expressed in numbers and graphs**. It is **used to test or confirm** theories and assumptions. This type of research can be used to establish **generalizable facts** about a topic.

qualitative & quantitative research

- Common quantitative methods include questionnaires with closed-ended questions.
- Qualitative resear ch is expressed in words. It is used to understand concepts, experiences. This type of research enables you to gather in-depth insights on topics that are not well understood.
- Common qualitative methods include interviews with open-ended questions, observations described in words, and literature reviews that explore concepts and theories.

qualitative & quantitative

- Example of qualitative

What is knowledge sharing for you?

- Example of quantitative

There is knowledge sharing with our classmate

Is there knowledge sharing with your classmate?

Research Planning and Research Methods

- **Research Planning/Research Design**

Before begins to do any research, it is essential to have a plan. Developing a plan will save time, stress and in the final analysis, yield a superior product. So, after defining and properly formulating a research problem, one should have a research design or plan of the research work

Research Planning and Research Methods

- **Research Methods**

Some literature use research methods, research methodology and research interchangeably. But, they have their own similarity and differences.

Research methods are the methods used by researchers to collect data to conduct research on a particular research topic.

It implies the methods employed by the researcher to conduct research.

Research Planning and Research Methods

Research Method: is a way to systematically solve the research problem by understanding how research is done scientifically.

It is necessary for the researcher:-

- To know the research methodology and techniques how conducted research
- To know which methodology or techniques are relevant and indicate the way.
- To understand the assumption that are underlining various techniques
- So, methods have many dimension and research methodology constitute only a part of the research methods.

Research Planning and Research Methods

- ***Research Methodology*:**

A research methodology is systematic approach to solve the research problem and to reach a new conclusion.

Research methodology signifies way to efficiently solving research problems.

Generally, The research method is defined as the procedure or technique applied by the researcher to undertake research. On the other hand, research methodology is a system of methods, used scientifically for solving the research problem.

Research Planning and Research Methods

- The philosophy common to all research methodology and technique is called Scientific methods. As Pearson (1968) put it, “the scientific method is one and the same in the branches (science) and that method is the methods of all logically trained minds”. Why scientific method? Because scientific method enables researchers to construct a reliable, consistent, and non-arbitrary representation of the world.

Research Planning and Research Methods

Research methodology can be put into three groups:

- Approaches or techniques of data collection
- Statistical techniques used to established relationship between variables
- Techniques involved in evaluating the accuracy of the result obtained

THE END of chapter one