INTRODUCTION TO RESEARCH

IT / CS RESEARCH METHODS

PRESENTATION OUTLINE: LESSON 1 – NATURE OF RESEARCH

1. Meaning and Importance of Research
2. Characteristics of a Good Research
3. Types of Research
4. Approaches to Research
5. Research Process

WHAT IS RESEARCH?

RESEARCH is a process to discover new knowledge.

A **systematic investigation** (i.e., the gathering and analysis of information) designed to develop or contribute to generalizable knowledge."

"extend human knowledge of the physical, biological, or social world beyond what is already known."

WHAT IS RESEARCH?

Research uses a systematic process called the **Scientific Method.**

Scientific Method consists of observing the world around you and creating a hypothesis about relationships in the world.

A **hypothesis** is an informed and educated prediction or explanation about something. Part of the research process involves testing the hypothesis, and then examining the results of these tests as they relate to both the hypothesis and the world around you.

IMPORTANCE OF RESEARCH

Research plays a crucial role in advancing knowledge, driving innovation, and facilitating informed decision-making in various fields and disciplines. Its importance extends across multiple domains, including science, technology, social sciences, healthcare, education, and business.

IMPORTANCE OF RESEARCH

Advancing Knowledge: Research is the primary means by which new knowledge is generated and existing knowledge is refined and expanded. It contributes to the growth of human understanding in various fields, pushing the boundaries of what is known.

Problem Solving: Research helps identify and address challenges, problems, and unanswered questions. It provides a structured approach to finding solutions and improving existing processes or systems.

IMPORTANCE OF RESEARCH

Education: Research is essential in academia, where it forms the foundation of curriculum development, teaching methods, and educational policy. It also contributes to the training of future researchers and professionals.

Innovation: Research often leads to the development of new products, technologies, and methods. Innovations resulting from research can drive economic growth, improve quality of life, and address pressing global issues.

IMPORTANCE OF RESEARCH

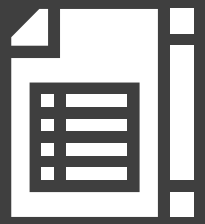
Continuous Learning: Research is an ongoing process that encourages lifelong learning. Researchers and professionals continually build on existing knowledge and adapt to changing circumstances.

Critical Thinking and Problem-Solving Skills: Engaging in research hones critical thinking, analytical, and problem-solving skills. Researchers must evaluate evidence, make reasoned arguments, and draw conclusions based on data.

RESEARCH CHARACTERISTICS

- ❑ Systematic
- ❑ Objective
- ❑ Empirical
- ❑ Valid
- ❑ Verifiable
- ❑ Comprehensive
- ❑ Critical
- ❑ Rigorous

APPROACHES TO RESEARCH

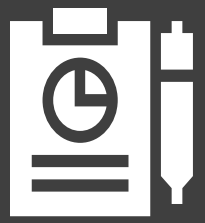


QUALITATIVE

focuses on exploring and understanding the complexities and nuances of human experiences, behaviors, and phenomena. It relies on non-numerical data, such as words, images, and observations.

QUANTITATIVE

approach that focuses on collecting and analyzing numerical data to understand, explain, and make predictions about phenomena or relationships. It is particularly well-suited for answering research questions that involve measuring, comparing, and quantifying variables



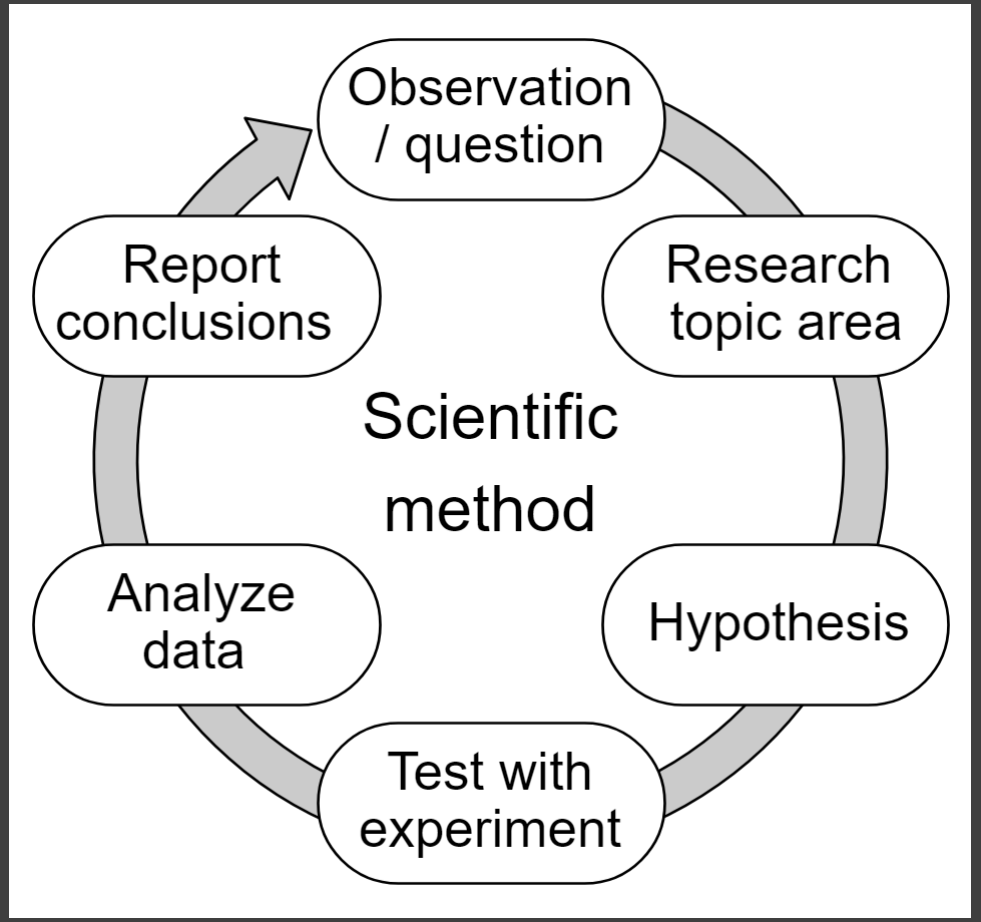
MIXED-METHODS

approach to research that combines both quantitative and qualitative research methods within a single study or research project.

RESEARCH PROCESS

No matter what topic is being studied, the value of the research depends on how well it is **designed** and **done**.

Therefore, one of the most important considerations in doing good research is to follow the design or plan that is developed by an **experienced researcher**.



RESEARCH DESIGN

Research Design "provides the glue that holds the research project together *(Trochim, 2005)*.

A design is used to structure the research, to show how all of the major parts of the research project work together to try to address the central research questions.

The research design is like a **recipe**. The research design is the **"backbone"** of the research protocol.

RESEARCH DESIGN

Research Studies are designed in a particular way to increase the chances of collecting the information needed to **answer a particular question**.

The information collected during research is only useful if the research design is sound and follows the **research protocol.**

The research design must make clear the procedures used to ensure the **protection of research subjects, whether human or animal**, and to **maintain the integrity of the information** collected in the study.