

Research Methodology and Types of Research

Research Methodology

Research methodology is the specific procedures or techniques used to identify, select, process, and analyze information about a topic. In a research paper, the methodology section allows the reader to critically evaluate a study's overall validity and reliability. The methodology section answers two main questions: How was the data collected or generated? How was it analyzed?

Research

Research is a process of systematic inquiry that entails collection of data; documentation of critical information; and analysis and interpretation of that data/information, in accordance with suitable methodologies set by specific professional fields and academic disciplines.

Research is conducted to evaluate the validity of a hypothesis or an interpretive framework; to assemble a body of substantive knowledge and findings for sharing them in appropriate manners; and to generate questions for further inquiries.

Characteristics of research

1. A systematic approach must be followed for accurate data. Rules and procedures are an integral part of the process that set the objective. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
2. Research is based on logical reasoning and involves both inductive and deductive methods.
3. The data or knowledge that is derived is in real time from actual observations in natural settings.
4. There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
5. Research creates a path for generating new questions. Existing data helps create more opportunities for research.

6. Research is analytical in nature. It makes use of all the available data so that there is no ambiguity in inference.
7. Accuracy is one of the most important aspects of research. The information that is obtained should be accurate and true to its nature. For example, laboratories provide a controlled environment to collect data. Accuracy is measured in the instruments used, the calibrations of instruments or tools, and the final result of the experiment.

Types of Research

Descriptive Research

Descriptive research is a type of research that describes a population, situation, or phenomenon that is being studied. It focuses on answering the *how, what, when, and where* questions of a research problem, rather than the *why*.

This is mainly because it is important to have a proper understanding of what a research problem is about before investigating why it exists in the first place.

Analytical Research

Analytical research is a specific type of research that involves critical thinking skills and the evaluation of facts and information relative to the research being conducted. A variety of people including students, doctors and psychologists use analytical research during studies to find the most relevant information.

Descriptive vs. Analytical Research

Analytical research focuses on understanding the cause-effect relationships between two or more variables. In analytical research, the researcher tries to explain the reasons why and how the trade deficit has moved in a specific direction within the given time.

Applied Research

Applied research refers to scientific study and research that seeks to solve practical problems. Applied research is used to find solutions to everyday problems, cure illness, and develop innovative technologies, rather than to acquire knowledge for knowledge's sake.

For example, applied researchers may investigate ways to:

- Improve agricultural crop production
- Treat or cure a specific disease
- Improve the energy efficiency of homes, offices, or modes of transportation

Fundamental Research

Fundamental research is driven by a scientist's curiosity or interest in a scientific question. The main motivation is to expand man's knowledge, not to create or invent something. There is no obvious commercial value to the discoveries that result from basic research.

For example, basic science investigations probe for answers to questions such as:

- How did the universe begin?
- What are protons, neutrons, and electrons composed of?
- How do slime molds reproduce?
- What is the specific genetic code of the fruit fly?

Qualitative research

Qualitative research is research dealing with phenomena that are difficult or impossible to quantify mathematically, such as beliefs, meanings, attributes, and symbols.

Qualitative researchers aim to gather an in-depth understanding of human behaviour and the reasons that govern such behaviour. The qualitative method investigates the why and how of decision making, not just what, where, when.

Quantitative research

Quantitative research refers to the systematic empirical investigation of any phenomena via statistical, mathematical or computational techniques. The objective of quantitative research is to develop and employ mathematical models, theories and/or hypotheses pertaining to phenomena

Quantitative research is generally made using scientific methods, which can include:

- The generation of models, theories and hypotheses
- The development of instruments and methods for measurement
- Experimental control and manipulation of variables
- Collection of empirical data
- Modelling and analysis of data
- Evaluation of results

Conceptual Research

Conceptual research is defined as a methodology wherein research is conducted by observing and analyzing already present information on a given topic. Conceptual research doesn't involve conducting any practical experiments. It is related to abstract concepts or ideas. Philosophers have long used conceptual research to develop new theories or interpret existing theories in a different light.

Empirical Research

Empirical research is a type of research methodology that makes use of verifiable evidence in order to arrive at research outcomes. In other words, this type of research relies solely on evidence obtained through observation or scientific data collection methods.

Empirical research can be carried out using qualitative or quantitative observation methods, depending on the data sample, that is, quantifiable data or non-numerical data. Unlike theoretical research that depends on preconceived notions about the research variables, empirical research carries a scientific investigation to measure the experimental probability of the research variables