

## **Research: Definition**

Research refers to a search of knowledge. It can be defined as a scientific and systematic search for relevant information in a particular topic. It also refers to the search for knowledge through systematic methods of finding solutions to problems.

Research is an approach / study on a problem using scientific methods. Research gives insights on diverse forms of life. Moreover, Biology encompasses other fields of research that are related to the sustainability of life, including the environment, ecosystem, food quality, causes of illnesses, the development of medicines, the study of the human body etc. Research is continuously advancing knowledge for promoting progress of a nation in all spheres of life.

## **Characteristics of research**

1. A systematic approach must be followed for accurate data.
2. Rules and procedures are an integral part of the process that set the objective.
3. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
4. Research is based on logical reasoning and involves both inductive and deductive methods.
5. The data or knowledge that is derived is in real time from actual observations in natural settings.
6. There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
7. Research creates a path for generating new questions and getting answers. Existing data helps create more opportunities for research.
8. Research is analytical in nature. It makes use of all the available data so that there is no ambiguity in inference.
9. Accuracy is one of the most important aspects of research. The information that is obtained should be accurate and true to its nature.
10. 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:**

**Basic research:** A basic research definition is data collected to enhance knowledge. The main motivation is knowledge expansion. It is a non-commercial research that doesn't facilitate in creating or inventing anything. For example: an experiment to determine a simple fact.

**Applied research:** Applied research focuses on analyzing and solving real-life problems. This type refers to the study that helps solve practical problems using scientific methods. Studies play an important role in solving issues that impact the overall well-being of humans. For example: finding a specific cure for a disease.

**Problem oriented research:** As the name suggests, problem-oriented research is conducted to understand the exact nature of a problem to find out relevant solutions. The term “problem” refers to multiple choices or issues when analyzing a situation.

For example, revenue of a car company has decreased by 12% in the last year. The following could be the probable causes: there is no optimum production, poor quality of a product, no advertising, or economic conditions.

**Problem solving research:** This type of research is conducted by companies to understand and resolve their own problems. The problem-solving method uses applied research to find solutions to the existing problems.

**Qualitative research:** Qualitative research is a process that is about inquiry. It helps create in-depth understanding of problems or issues in their natural settings. This is a non-statistical method.

Qualitative research is heavily dependent on the experience of the researchers and the questions used to probe the sample. The sample size is usually restricted to 6-10 people. Open-ended questions are asked in a manner that encourages answers that lead to another question or group of questions. The purpose of asking open-ended questions is to gather as much information as possible from the sample.

The following are the methods used for qualitative research:

1. One-to-one interview
2. Focus groups
3. Ethnographic research
4. Content/Text Analysis
5. Case study research

**Quantitative research:** Quantitative research is a structured way of collecting data and analyzing it to draw conclusions. Unlike qualitative methods, this method uses a computational and statistical process to collect and analyze data. Quantitative data is all about numbers.

Quantitative research involves a larger population — more people means more data. With more data to analyze, you can obtain more accurate results. This method uses close-ended questions because the researchers are typically looking to gather statistical data.

Online surveys, questionnaires, and polls are preferable data collection tools used in quantitative research. There are various methods of deploying surveys or questionnaires. Online surveys allow survey creators to reach large amounts of people or smaller focus groups for different types of research that meet different goals. Survey respondents can receive surveys on mobile phones, in emails, or can simply use the internet to access surveys.