

What is research methodology?

A research methodology describes the techniques and procedures used to identify and analyze information regarding a specific research topic. It is a process by which researchers design their study so that they can achieve their objectives using the selected research instruments. It includes all the important aspects of research, including research design, data collection methods, data analysis methods, and the overall framework within which the research is conducted. While these points can help you understand what is research methodology, you also need to know why it is important to pick the right methodology.

Why is research methodology important?

Having a good research methodology in place has the following advantages:³

- Helps other researchers who may want to replicate your research; the explanations will be of benefit to them.
- You can easily answer any questions about your research if they arise at a later stage.
- A research methodology provides a framework and guidelines for researchers to clearly define research questions, hypotheses, and objectives.
- It helps researchers identify the most appropriate research design, sampling technique, and data collection and analysis methods.
- A sound research methodology helps researchers ensure that their findings are valid and reliable and free from biases and errors.
- It also helps ensure that ethical guidelines are followed while conducting research.

Types of research methodology

There are three types of research methodology based on the type of research and the data required.¹

- **Quantitative research methodology** focuses on measuring and testing numerical data. This approach is good for reaching a large number of people in a short amount of time. This type of research helps in testing the causal relationships between variables, making predictions, and generalizing results to wider populations.
- **Qualitative research methodology** examines the opinions, behaviors, and experiences of people. It collects and analyzes words and textual data. This research methodology requires fewer participants but is still more time consuming because the time spent per participant is quite large. This method is used in exploratory research where the research problem being investigated is not clearly defined.

- **Mixed-method research methodology** uses the characteristics of both quantitative and qualitative research methodologies in the same study. This method allows researchers to validate their findings, verify if the results observed using both methods are complementary, and explain any unexpected results obtained from one method by using the other method.

What are the types of sampling designs in research methodology?

Sampling⁴ is an important part of a research methodology and involves selecting a representative sample of the population to conduct the study, making statistical inferences about them, and estimating the characteristics of the whole population based on these inferences. There are two types of sampling designs in research methodology—probability and nonprobability.

What are data collection methods?

During research, data are collected using various methods depending on the research methodology being followed and the research methods being undertaken. Both qualitative and quantitative research have different data collection methods, as listed below.

Qualitative research⁵

- *One-on-one interviews*: Helps the interviewers understand a respondent's subjective opinion and experience pertaining to a specific topic or event
- *Document study/literature review/record keeping*: Researchers' review of already existing written materials such as archives, annual reports, research articles, guidelines, policy documents, etc.
- *Focus groups*: Constructive discussions that usually include a small sample of about 6-10 people and a moderator, to understand the participants' opinion on a given topic.

Quantitative research⁶

- *Sampling*: The most common type is probability sampling.
- *Interviews*: Commonly telephonic or done in-person.
- *Observations*: Structured observations are most commonly used in quantitative research. In this method, researchers make observations about specific behaviors of individuals in a structured setting.
- *Document review*: Reviewing existing research or documents to collect evidence for supporting the research.
- *Surveys and questionnaires*. Surveys can be administered both online and offline depending on the requirement and sample size.

How to write a research methodology?

A research methodology should include the following components:^{3,9}

1. **Research design**—should be selected based on the research question and the data required. Common research designs include experimental, quasi-experimental, correlational, descriptive, and exploratory.
2. **Research method**—this can be quantitative, qualitative, or mixed-method.
3. **Reason for selecting a specific methodology**—explain why this methodology is the most suitable to answer your research problem.
4. **Research instruments**—explain the research instruments you plan to use, mainly referring to the data collection methods such as interviews, surveys, etc. Here as well, a reason should be mentioned for selecting the particular instrument.

5. **Sampling**—this involves selecting a representative subset of the population being studied.
6. **Data collection**—involves gathering data using several data collection methods, such as surveys, interviews, etc.
7. **Data analysis**—describe the data analysis methods you will use once you've collected the data.
8. **Research limitations**—mention any limitations you foresee while conducting your research.
9. **Validity and reliability**—validity helps identify the accuracy and truthfulness of the findings; reliability refers to the consistency and stability of the results over time and across different conditions.
10. **Ethical considerations**—research should be conducted ethically. The considerations include obtaining consent from participants, maintaining confidentiality, and addressing conflicts of interest.