**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.

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.

A good research methodology helps researchers in planning their research efficiently, by ensuring optimum usage of their time and resources.

**Types of research methodology**

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

1Quantitative 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.

Probability sampling

In this type of sampling design, a sample is chosen from a larger population using some form of random selection, that is, every member of the population has an equal chance of being selected. The different types of probability sampling are:

Simple random—every single member is chosen randomly.

Systematic—sample members are chosen at regular intervals. It requires selecting a starting point for the sample and sample size determination that can be repeated at regular intervals. This type of sampling method has a predefined range; hence, it is the least time consuming.

Stratified—researchers divide the population into smaller groups that don’t overlap but represent the entire population. While sampling, these groups can be organized, and then a sample can be drawn from each group separately.

Cluster—the population is divided into clusters based on demographic parameters like age, sex, location, etc.

Nonprobability sampling involves feedback based on a researcher’s sample selection capabilities and not on a fixed selection process. The different types of nonprobability sampling methods are:

Convenience—selects participants who are most easily accessible to researchers due to geographical proximity, availability at a particular time, etc.

Purposive—participants are selected at the researcher’s discretion. Researchers consider the purpose of the study and the understanding of the target audience.

Snowball—already selected participants use their social networks to refer the researcher to other potential participants.

Quota—while designing the study, the researchers decide how many people with which characteristics to include as participants. The characteristics help in choosing people most likely to provide insights into the subject.

How to choose a research methodology?

Here are some important factors to consider when choosing a research methodology:8

Research objectives, aims, and questions—these would help structure the research design.

Review existing literature to identify any gaps in knowledge.

Check the statistical requirements—if data-driven or statistical results are needed then quantitative research is the best. If the research questions can be answered based on people’s opinions and perceptions, then qualitative research is most suitable.

Sample size—sample size can often determine the feasibility of a research methodology. For a large sample, less effort- and time-intensive methods are appropriate.

Constraints—constraints of time, geography, and resources can help define the appropriate methodology.

How to write a research methodology?

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

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.

Research method—this can be quantitative, qualitative, or mixed-method.

Reason for selecting a specific methodology—explain why this methodology is the most suitable to answer your research problem.

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.

Sampling—this involves selecting a representative subset of the population being studied.

Data collection—involves gathering data using several data collection methods, such as surveys, interviews, etc.

Data analysis—describe the data analysis methods you will use once you’ve collected the data.

Research limitations—mention any limitations you foresee while conducting your research.

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.

Ethical considerations—research should be conducted ethically. The considerations include obtaining consent from participants, maintaining confidentiality, and addressing conflicts of interest.