

Research Design

What is research design?

Have you been wondering “what is research design?” or “what are some research design examples?” Don’t worry! In this article, we’ve got you covered!

A research design is the plan or framework used to conduct a research study. It involves outlining the overall approach and methods that will be used to collect and analyse data in order to answer research questions or test hypotheses. A well-designed research study should have a clear and well-defined research question, a detailed plan for collecting data, and a method for analysing and interpreting the results. A well-thought-out research design addresses all these features.

Research design elements

Research design elements include the following:

Clear purpose: The research question or hypothesis must be clearly defined and focused.

Sampling: This includes decisions about sample size, sampling method, and criteria for inclusion or exclusion. The approach varies for different research design types.

Data collection: This research design element involves the process of gathering data or information from the study participants or sources. It includes decisions about what data to collect, how to collect it, and the tools or instruments that will be used.

Data analysis: All research design types require analysis and interpretation of the data collected. This research design element includes decisions about the statistical tests or methods that will be used to analyze the data, as well as any potential confounding variables or biases that may need to be addressed.

Type of research methodology: This includes decisions about the overall approach for the study.

Time frame: An important research design element is the time frame, which includes decisions about the duration of the study, the timeline for data collection and analysis, and follow-up periods.

Ethical considerations: The research design must include decisions about ethical considerations such as informed consent, confidentiality, and participant protection.

Resources: A good research design takes into account decisions about the budget, staffing, and other resources needed to carry out the study.

The elements of research design should be carefully planned and executed to ensure the validity and reliability of the study findings. Let's go deeper into the concepts of research design.

Characteristics of research design

Some basic characteristics of research design are common to different research design types. These characteristics of research design are as follows:

Neutrality: Right from the study assumptions to setting up the study, a neutral stance must be maintained, free of pre-conceived notions. The researcher's expectations or beliefs should not colour the findings or interpretation of the findings. Accordingly, a good research design should address potential sources of bias and confounding factors to be able to yield unbiased and neutral results.

Reliability: Reliability is one of the characteristics of research design that refers to consistency in measurement over repeated measures and fewer random errors. A reliable research design must allow for results to be consistent, with few errors due to chance.

Validity: Validity refers to the minimization of nonrandom (systematic) errors. A good research design must employ measurement tools that ensure validity of the results.

Generalizability: The outcome of the research design should be applicable to a larger population and not just a small sample. A generalized method means the study can be conducted on any part of a population with similar accuracy.

Flexibility: A research design should allow for changes to be made to the research plan as needed, based on the data collected and the outcomes of the study

A well-planned research design is critical for conducting a scientifically rigorous study that will generate neutral, reliable, valid, and generalizable results. At the same time, it should allow some level of flexibility.

Different types of research design

A research design is essential to systematically investigate, understand, and interpret phenomena of interest. Let's look at different types of research design and research design examples.

Broadly, research design types can be divided into qualitative and quantitative research.

Qualitative research is subjective and exploratory. It determines relationships between collected data and observations. It is usually carried out through interviews with open-ended questions, observations that are described in words, etc.

Quantitative research is objective and employs statistical approaches. It establishes the cause-and-effect relationship among variables using different statistical and computational methods. This type of research is usually done using surveys and experiments.

Qualitative research vs. Quantitative research

Qualitative research

Deals with subjective aspects, e.g., experiences, beliefs, perspectives, and concepts.

Deals with non-numerical data, such as words, images, and observations.

In qualitative research design, data are collected via direct observations, interviews, focus groups, and naturally occurring data. Methods for conducting qualitative research are grounded theory, thematic analysis, and discourse analysis.

Data analysis involves interpretation and narrative analysis.

Quantitative research

Measures different types of variables and describes frequencies, averages, correlations, etc.

Tests hypotheses about relationships between variables. Results are presented numerically and statistically.

Quantitative research design is empirical. Data collection methods involved are experiments, surveys, and observations expressed in numbers. The research design categories under this are descriptive, experimental, correlational, diagnostic, and explanatory.

Data analysis involves statistical analysis and hypothesis testing.

The reasoning used to synthesize data is inductive. The reasoning used to synthesize data is deductive.

Typically used in fields such as sociology, linguistics, and anthropology. Typically used in fields such as economics, ecology, statistics, and medicine.

Example: Focus group discussions with women farmers about climate change perception. Example: Testing the effectiveness of a new treatment for insomnia.

Qualitative research design types and qualitative research design examples

The following will familiarize you with the research design categories in qualitative research:

Grounded theory: This design is used to investigate research questions that have not previously been studied in depth. Also referred to as exploratory design, it creates sequential guidelines, offers strategies for inquiry, and makes data collection and analysis more efficient in qualitative research.

Example: A researcher wants to study how people adopt a certain app. The researcher collects data through interviews and then analyses the data to look for patterns. These patterns are used to develop a theory about how people adopt that app.

Thematic analysis: This design is used to compare the data collected in past research to find similar themes in qualitative research.

Example: A researcher examines an interview transcript to identify common themes, say, topics or patterns emerging repeatedly.

Discourse analysis: This research design deals with language or social contexts used in data gathering in qualitative research.

Example: Identifying ideological frameworks and viewpoints of writers of a series of policies.

Quantitative research design types and quantitative research design examples

Note the following research design categories in quantitative research:

Descriptive research design: This quantitative research design is applied where the aim is to identify characteristics, frequencies, trends, and categories. It may not often begin with a hypothesis. The basis of this research type is a description of an identified variable. This research design type describes the “what,” “when,” “where,” or “how” of phenomena (but not the “why”).

Example: A study on the different income levels of people who use nutritional supplements regularly.

Correlational research design: Correlation reflects the strength and/or direction of the relationship among variables. The direction of a correlation can be positive or negative. Correlational research design helps researchers establish a relationship between two variables without the researcher controlling any of them.

Example: An example of correlational research design could be studying the correlation between time spent watching crime shows and aggressive behaviour in teenagers.

Diagnostic research design: In diagnostic design, the researcher aims to understand the underlying cause of a specific topic or phenomenon (usually an area of improvement) and find the most effective solution. In simpler terms, a researcher seeks an accurate “diagnosis” of a problem and identifies a solution.

Example: A researcher analysing customer feedback and reviews to identify areas where an app can be improved.

Explanatory research design: In explanatory research design, a researcher uses their ideas and thoughts on a topic to explore their theories in more depth. This design is used to explore a phenomenon when limited information is available. It can help increase current understanding of unexplored aspects of a subject. It is thus a kind of “starting point” for future research.

Example: Formulating hypotheses to guide future studies on delaying school start times for better mental health in teenagers.

Causal research design: This can be considered a type of explanatory research. Causal research design seeks to define a cause and effect in its data. The researcher does not use a randomly chosen control group but naturally or pre-existing groupings. Importantly, the researcher does not manipulate the independent variable.

Example: Comparing school dropout levels and possible bullying events.

Experimental research design: This research design is used to study causal relationships. One or more independent variables are manipulated, and their effect on one or more dependent variables is measured.

Example: Determining the efficacy of a new vaccine plan for influenza.

Benefits of research design

There are numerous benefits of research design. These are as follows:

Clear direction: Among the benefits of research design, the main one is providing direction to the research and guiding the choice of clear objectives, which help the researcher to focus on the specific research questions or hypotheses they want to investigate.

Control: Through a proper research design, researchers can control variables, identify potential confounding factors, and use randomization to minimize bias and increase the reliability of their findings.

Replication: Research designs provide the opportunity for replication. This helps to confirm the findings of a study and ensures that the results are not due to chance or other factors. Thus, a well-chosen research design also eliminates bias and errors.

Validity: A research design ensures the validity of the research, i.e., whether the results truly reflect the phenomenon being investigated.

Reliability: Benefits of research design also include reducing inaccuracies and ensuring the reliability of the research (i.e., consistency of the research results over time, across different samples, and under different conditions).

Efficiency: A strong research design helps increase the efficiency of the research process. Researchers can use a variety of designs to investigate their research questions, choose the most appropriate research design for their study, and use statistical analysis to make the most of their data. By effectively describing the data necessary for an adequate test of the hypotheses and explaining how such data will be obtained, research design saves a researcher's time.

Overall, an appropriately chosen and executed research design helps researchers to conduct high-quality research, draw meaningful conclusions, and contribute to the advancement of knowledge in their field.