EXPLAIN THE VARIOUS RESEARCH METHODS AND HOW THEY CAN BE APPLIED

Research methods are used to produce new knowledge or deepen understanding of a topic or issue. In addition, some of the differing techniques for conducting educational research reflect different paradigms in scientific thought. The various research methods are.

Qualitative methods of research

This is a scientific method of observation to gather non numerical data while focusing on meaning making. This often occurs through ‘case study, personal experience, introspection, life story, interview, artifacts and cultural texts and productions, along with observational. Historical interactional and visual texts. Qualitative research seeks to question, systematically uses a predefined set procedures to answer the question, collects evidence, produces findings that were not determined in advance and produces findings that are applicable beyond the immediate boundaries of the study. Qualitative research shares these characteristics. Additionally, it seeks to understand a given research problem or topic from the perspectives of the local population it involves. Qualitative research is especially effective in obtaining culturally specific information about the values, opinions, behaviors, and social contexts of particular populations.

Qualitative research provides complex textual descriptions of how people experience a given research issue. It provides information about the “human” side of an issue- that is, the often contradictory behavious, beliefs, opinions, emotions, and relationships of individuals, qualitative methods are also effective in identifying intangible factors, such as social norms, socioeconomic status, gender roles, ethnicity, and religion, whose role in the research issue may not be readily apparent. When used along with quantitative methods qualitative research can help us to interpret and better understand the complex reality of a given sitituation and the implications of quantitative data.

Although findings from qualitative data can often be extended to people with characteristics similar to those in the study population, gaining a rich and complex understanding of a specific social context or phenomenon typically takes precedence over eliciting data that can be generalized to other geographical areas or populations. In this sense, qualitative research differs slightly from scientific research in general.

What are some qualitative research methods? The three most common qualitative methods, explained in detail in their respective modules, are participant observation, in-depth interviews, and focus groups. Each method is particularly suited for obtaining a specific type of data.

• Participant observation is appropriate for collecting data on naturally occurring behaviors in their usual contexts. • In-depth interviews are optimal for collecting data on individuals’personal histories, perspectives, and experiences, particularly when sensitive topics are being explored. • Focus groups are effective in eliciting data on the cultural norms of a group and in generating broad overviews of issues of concern to the cultural groups or subgroups represented.

Applications of qualitative research

Qualitative research can be employed in formative evaluations, especially when the objective is to describe the setting and context for new intervention or treatment regimen. In the case of sexually transmitted infections research data is collected from the target population to better understand their profiles, needs and help seeking related experiences.

OUANTITATIVE METHOD OF RESEARCH

Quantitative research is defined as a systematic investigation of phenomena by gathering quantifiable data and performing statistical, mathematical, or computational techniques. Quantitative research collects information from existing and potential customers using [sampling methods](https://www.questionpro.com/blog/types-of-sampling-for-social-research/) and sending out [online surveys](https://www.questionpro.com/online-surveys.html), [online polls](https://www.questionpro.com/online-poll.html), [questionnaires](https://www.questionpro.com/blog/what-is-a-questionnaire/), etc., the results of which can be depicted in the form of numerical. After careful understanding of these numbers to predict the future of a product or service and make changes accordingly.

An example of quantitative research is the survey conducted to understand the amount of time a doctor takes to tend to a patient when the patient walks into the hospital. A [patient satisfaction survey template](https://www.questionpro.com/survey-templates/hospital-patient-satisfaction/) can be administered to ask questions like how much time did a doctor take to see a patient, how often does a patient walk into a hospital, and other such questions.

Quantitative research is mostly conducted in the social sciences using the statistical methods used above to collect [quantitative data](https://www.questionpro.com/blog/quantitative-data/) from the research study. In this [research method](https://www.questionpro.com/blog/what-is-research/), researchers and statisticians deploy mathematical frameworks and theories that pertain to the quantity under question.

Quantitative research templates are objective, elaborate, and many times, even investigational. The results achieved from this research method are logical, statistical, and unbiased. [Data collection](https://www.questionpro.com/blog/survey-data-collection/) happened using a structured method and conducted on larger samples that represent the entire population.

As mentioned above, quantitative research is data-oriented. There are two methods to conduct quantitative research. They are:

[**Primary Quantitative Research Methods**](https://www.questionpro.com/blog/quantitative-research/)

There are four different types of quantitative research methods:

Primary quantitative research is the most widely used method of conducting [market research](https://www.questionpro.com/blog/what-is-market-research/). The distinct feature of [primary research](https://www.questionpro.com/blog/primary-research/) is that the researcher focuses on collecting data directly rather than depending on data collected from previously done research. Primary quantitative research can be broken down into three further distinctive tracks, as well as the process flow. They are:

[**A. Techniques and Types of Studies**](https://www.questionpro.com/blog/quantitative-research/)

There are multiple types of primary quantitative research. They can be distinguished into the four following distinctive methods, which are:

**Survey Research:**

[Survey Research](https://www.questionpro.com/tour/survey-research.html) is the most fundamental tool for all quantitative research methodologies and studies. Surveys used to ask questions to a sample of respondents, using various types such as [online polls](https://www.questionpro.com/online-poll.html), online [surveys](https://www.questionpro.com/blog/surveys/), paper [questionnaires](https://www.questionpro.com/blog/what-is-a-questionnaire/), web-intercept surveys, etc. Every small and big organization intends to understand what their customers think about their products and services, how well are new features faring in the market and other such details.

By conducting [survey research](https://www.questionpro.com/article/survey-research.html), an organization can ask multiple [survey questions](https://www.questionpro.com/article/survey-question-answer-type.html), collect data from a pool of customers, and analyze this collected data to produce numerical results. It is the first step towards collecting data.

This type of research can be conducted with a specific target audience group and also can be conducted across multiple groups along with comparative analysis. A prerequisite for this type of research is that the [sample of respondents](https://www.questionpro.com/audience/) must have randomly selected members. This way, a researcher can easily maintain the accuracy of the obtained results as a huge variety of respondents will be addressed using random selection. Traditionally, survey research was conducted face-to-face or via phone calls but with the progress made by online mediums such as email or social media, survey research has spread to online mediums as well.

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There are two types of surveys, either of which can be chosen based on the time in-hand and the kind of data required:

**Cross-sectional surveys:** [Cross-sectional surveys](https://www.questionpro.com/blog/cross-sectional-study/) are observational surveys conducted in situations where the researcher intends to [collect data](https://www.questionpro.com/blog/data-collection/) from a [sample](https://www.questionpro.com/blog/types-of-sampling-for-social-research/) of the target population at a given point in time. Researchers can evaluate various variables at a particular time. Data gathered using this type of survey is from people who depict similarity in all variables except the variables which is considered for research. Throughout the survey, this one variable will stay constant.

Cross-sectional surveys are popular with retail, SMEs, healthcare industries. Information is garnered without modifying any parameters in the variable ecosystem.

Using cross-sectional survey research method, multiple samples can be analyzed and compared.

Multiple variables can be evaluated using this type of survey research.

The only disadvantage of cross-sectional surveys is that the cause-effect relationship of variables cannot be established as it usually evaluates variables at a particular time and not across a continuous time frame.

**Longitudinal surveys:** [Longitudinal surveys](https://www.questionpro.com/blog/longitudinal-study/) are also observational surveys but, unlike cross-sectional surveys, longitudinal surveys are conducted across various time durations to observe a change in respondent behavior and thought-processes. This time can be days, months, years, or even decades. For instance, a researcher planning to analyze the change in buying habits of teenagers over 5 years will conduct longitudinal surveys.

In cross-sectional surveys, the same variables were evaluated at a given point in time, and in longitudinal surveys, different variables can be analyzed at different intervals of time.

Longitudinal surveys are extensively used in the field of medicine and applied sciences. Apart from these two fields, they are also used to observe a change in the market trend, analyze customer satisfaction, or gain [feedback on products/services](https://www.questionpro.com/survey-templates/product-surveys/).

In situations where the sequence of events is highly essential, longitudinal surveys are used.

Researchers say that when there are [research](https://www.questionpro.com/blog/what-is-research/) subjects that need to be thoroughly inspected before concluding, they rely on longitudinal surveys.

**Correlational Research:**

A comparison between two entities is invariable. [Correlation research](https://www.questionpro.com/blog/correlational-research/) is conducted to establish a relationship between two closely-knit entities and how one impacts the other and what are the changes that are eventually observed. This research method is carried out to give value to naturally occurring relationships, and a minimum of two different groups are required to conduct this quantitative research method successfully. Without assuming various aspects, a relationship between two groups or entities must be established.

Researchers use this quantitative research method to correlate two or more variables using mathematical analysis methods. Patterns, relationships, and trends between variables are concluded as they exist in their original set up. The impact of one of these variables on the other is observed along with how it changes the relationship between the two variables. Researchers tend to manipulate one of the variables to attain the desired results.

Ideally, it is advised not to make conclusions merely based on correlational research. This is because it is not mandatory that if two variables are in sync that they are interrelated.

Example of Correlational Research Questions:

The relationship between stress and depression.

The equation between fame and money.

The relation between activities in a third-grade class and its students.

**Causal-Comparative Research:**

This research method mainly depends on the factor of comparison. Also called the quasi-experimental research, this quantitative research method is used by researchers to conclude cause-effect equation between two or more variables, where one variable is dependent on the other independent variable. The independent variable is established but not manipulated, and its impact on the dependent variable is observed. These variables or groups must be formed as they exist in the natural set up. As the dependent and independent variables will always exist in a group, it is advised that the conclusions are carefully established by keeping all the factors in mind.

Causal-comparative research is not restricted to the [statistical analysis](https://www.questionpro.com/market-research.html#Statistical_Analysis_Techniques_for_Market_Analysis) of two variables but extends to analyzing how various variables or groups change under the influence of the same changes. This research is conducted irrespective of the type of relation that exists between two or more variables. Statistical analysis is used to distinctly present the outcome of obtained using this quantitative research method.

Example of Causal-Comparative Research Questions:

The impact of drugs on a teenager.

The effect of good education on a freshman.

The effect of substantial food provision in the villages of Africa.

**Experimental Research:** Also known as true experimentation, this research method is reliant on a theory. [Experimental research](https://www.questionpro.com/blog/experimental-research/), as the name suggests, is usually based on one or more theories. This theory has not been proven in the past and is merely a supposition. In experimental research, an analysis is done around proving or disproving the statement. This research method is used in natural sciences.

There can be multiple theories in experimental research. A theory is a statement that can be verified or refuted.

After establishing the statement, efforts are made to understand whether it is valid or invalid. This type of quantitative research method is mainly used in natural or social sciences as there are various statements which need to be proved right or wrong.

Traditional research methods are more effective than modern techniques.

Systematic teaching schedules help children who find it hard to cope up with the course.

It is a boon to have responsible nursing staff for ailing parents.

Quantitative Research Characteristics

Some distinctive characteristics of quantitative research are:

**Structured tools:** Structured tools such as [surveys](https://www.questionpro.com/blog/surveys/), [polls](https://www.questionpro.com/election-polls.html), or [questionnaires](https://www.questionpro.com/blog/what-is-a-questionnaire/) are used to gather quantitative data. Using such structure methods helps in collecting in-depth and actionable data from the survey respondents.

**Sample size:** Quantitative research is conducted on a significant [sample size](https://www.questionpro.com/blog/determining-sample-size/) that represents the target market. Appropriate [sampling methods](https://www.questionpro.com/blog/types-of-sampling-for-social-research/) have to be used when deriving the sample to fortify the research objective

**Close-ended questions:** [Closed-ended questions](https://www.questionpro.com/close-ended-questions.html) are created per the objective of the research. These questions help collect [quantitative data](https://www.questionpro.com/blog/quantitative-data/) and hence, are extensively used in quantitative research.

**Prior studies:** Various factors related to the research topic are studied before collecting feedback from respondents.

**Quantitative data:** Usually, [quantitative data](https://www.questionpro.com/blog/quantitative-data/) is represented by tables, charts, graphs, or any other non-numerical form. This makes it easy to understand the data that has been collected as well as prove the validity of the [market research](https://www.questionpro.com/blog/what-is-market-research/).

**Generalization of results:** Results of this research method can be generalized to an entire population to take appropriate actions for improvement.

[Quantitative Research Examples](https://www.questionpro.com/blog/quantitative-research/)

Some examples of Quantitative Research are:

If any organization would like to conduct a [customer satisfaction (CSAT)](https://www.questionpro.com/customer-satisfaction.html) survey, a [customer satisfaction survey template](https://www.questionpro.com/survey-templates/customer-satisfaction-survey-template/) can be used. Through this survey, an organization can collect quantitative data and metrics on the goodwill of the brand or organization in the mind of the customer based on multiple parameters such as product quality, pricing, customer experience, etc. This data can be collected by asking a [net promoter score (NPS)](https://www.questionpro.com/features/net-promoter-score.html) question, matrix table questions, etc. that provide data in the form of numbers that can be analyzed and worked upon.

Another example of quantitative research is an organization that conducts an event, collecting feedback from the event attendees about the value that they see from the event. By using an [event survey template](https://www.questionpro.com/survey-templates/event-planning-evaluation/), the organization can collect actionable feedback about satisfaction levels of customers during various phases of the event such as the sales, pre and post-event, the likelihood of recommending the organization to their friends and colleagues, hotel preferences for the future events and other such questions.

[**Advantages of Quantitative Research**](https://www.questionpro.com/blog/quantitative-research/)

There are many advantages of quantitative research. Some of the major advantages why researchers use this method in [market research](https://www.questionpro.com/blog/what-is-market-research/) are:

**Collect reliable and accurate data:** As data is collected, analyzed, and presented in numbers, the results obtained will be extremely reliable. Numbers do not lie. They offer an honest picture of the conducted research without discrepancies and is also extremely accurate. In situations where a researcher predicts conflict, quantitative research is conducted.

**Quick data collection:** A quantitative research is carried out with a group of respondents who represent a population. A [survey](https://www.questionpro.com/tour/) or any other quantitative research method applied to these respondents and the involvement of statistics, conducting, and analyzing results is quite straightforward and less time-consuming.

**Wider scope of data analysis:** Due to the statistics, this research method provides a wide scope of data collection.

**Eliminate bias:** This research method offers no scope for personal comments or biasing of results. The results achieved are numerical and are thus, fair in most cases.

What are the basic differences between quantitative and qualitative research methods?

Quantitative and qualitative research methods differ primarily in:

• their analytical objectives • the types of questions they pose.

• the types of data collection instruments they use.

• the forms of data they produce.

• the degree of flexibility built into study design.

THE SCIENTIFIC METHOD

This is the use of mathematical and experimental technique employed in sciences, it is the technique used in the contruction and testing of a scientific hypothesis. The process of observing, asking questions, and seeking answers through tests and experiments is not unique to any one field of science. In fact, the scientific method is applied broadly in science, across many different fields. Many [empirical](https://www.merriam-webster.com/dictionary/empirical) sciences, especially the [social sciences](https://www.britannica.com/topic/social-science), use mathematical tools borrowed from [probability theory](https://www.britannica.com/science/probability-theory) and [statistics](https://www.britannica.com/science/statistics), together with outgrowths of these, such as [decision theory](https://www.britannica.com/science/decision-theory-statistics), [game theory](https://www.britannica.com/science/game-theory), utility theory, and [operations research](https://www.britannica.com/topic/operations-research). [Philosophers of science](https://www.britannica.com/topic/philosophy-of-science) have addressed general methodological problems, such as the nature of scientific [explanation](https://www.britannica.com/topic/explanation) and the justification of [induction](https://www.britannica.com/topic/induction-reason). The scientific method is critical to the development of [scientific theories](https://www.britannica.com/science/scientific-theory), which explain empirical (experiential) laws in a scientifically rational manner. In a typical application of the scientific method, a researcher develops a [hypothesis](https://www.merriam-webster.com/dictionary/hypothesis), tests it through various means, and then modifies the hypothesis on different scientific investigations undertaken to explore hypotheses, scientists are able to develop broad general explanations, or scientific theories.the basis of the outcome of the tests and experiments. The modified hypothesis is then retested, further modified, and tested again, until it becomes consistent with observed phenomena and testing outcomes. In this way, [hypotheses](https://www.merriam-webster.com/dictionary/hypotheses) serve as tools by which scientists gather data. From that data and the many