

5. A Study on Qualitative, Quantitative Methods

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5.1 Introduction:

5.1.1 The Definition of Quantitative Research Method:

Quantitative research methods are intended to gather numerical data that may be utilized to quantify variables. Quantitative data is structured and statistical, with objective and clear outcomes. It employs a grounded theory approach that is based on systematic data collection and analysis. Quantitative research is an approach that can help you draw broad conclusions from your research and forecast outcomes.

Surveys are an excellent instrument for quantitative research because they are inexpensive, adaptable, and allow researchers to collect data from a wide sample size.

5.1.2 The Definition of Qualitative Research Method:

Qualitative research is an approach for gathering non-numerical data in order to generate insights. It is unstructured or semi-structured and non-statistical.

Qualitative data is information that aims to describe rather than measure a topic. This sort of research assesses ideas, points of view, and characteristics rather than actual figures given in a graph or chart.

Qualitative research methods, such as interviews or focus groups, typically require first-hand observation. Market research is typically conducted in natural settings, which means that researchers see things as they are without manipulation—no experiments or control groups are used.

Qualitative researchers seek to delve deeply into a topic in order to learn about people's motives, thoughts, and opinions. While qualitative approaches add richness to your research topics, they might make the results more difficult to analyses. [1]

5.2 Quantitative Research and Data:

The goal of quantitative research is to quantify a phenomenon. It is more systematic, objective, and aids in the reduction of researcher biases. It gets at the heart of a person's behavior by answering questions such as how many, how frequently, and to what extent?

Quantitative data is numerical in nature. Consider length, size, amount, price, and duration as quantifiable quantities. The information can be used to confirm or disprove a theory or to predict relationships. Quantitative data is analyzed statistically and presented in tables, graphs, percentages, and other statistical formats.

5.3 Qualitative Research and Data:

Qualitative research is a method of collecting descriptive data that is used to identify details that help explain behavior. It conveys the breadth of people's ideas and experiences. In summary, qualitative research helps us understand why, how, or in what way a specific event or behavior occurs. Anything that describes or explains—from observations of an interaction to quotes from people about their experiences, attitudes, beliefs, and thoughts—is considered qualitative data. It can also take the form of words, photographs, video, audio, transcripts, and so on. [2]

5.4 Qualitative vs. Quantitative Data Collection:

Because qualitative and quantitative research collect different types of information, their data collection methods differ significantly. Quantitative research is based on numerical or measurable data. Qualitative studies, on the other hand, rely on personal stories or documentation that detail how people think or respond within society.

5.5 Qualitative Research:

Non-numerical data collection and interpretation are part of qualitative research approaches. Some qualitative data sources are as follows:

- Interviews
- Focus groups
- Documents
- Personal accounts or papers
- Cultural records
- Observation

The researcher may conduct interviews or focus groups during a qualitative study to obtain data that is not available in current documentation or records. Interviews and focus groups can be unstructured or semi-structured to allow for various or unexpected responses. In an unstructured or semi-structured format, the researcher can ask open-ended questions and then follow the responses. The responses provide a thorough view of each individual's experiences, which are then compared to those of other study participants.

5.6 Quantitative Research:

Quantitative investigations, on the other hand, necessitate various data collection methodologies. Compiling numerical data to investigate causal links among variables is one of these strategies. Data gathering methods for this type of study include:

- Experiments
- Questionnaires
- Surveys
- Database reports

The procedures described above produce data that is suitable for numerical analysis. In this situation, questionnaires use a multiple-choice style to provide countable answers, such as yes or no, which may then be converted into quantifiable data.

5.7 Qualitative vs. Quantitative Outcomes:

The nature of the intended outcome is one of the elements that distinguishes qualitative research from quantitative studies. Qualitative researchers aim to learn from the specifics of persons they are investigating, often known as their informants. Conclusions are generated from a study by accumulating, comparing, and assessing informants' feedback and contribution. The "why" behind a phenomenon, correlation, or behaviour is frequently the subject of qualitative study. In contrast, quantitative data is mathematically analysed to create a statistical picture of a trend or connection. These statistical findings could offer light on cause-and-effect linkages. They may either confirm or refute the original hypothesis of the investigation. Whether positive or negative, the outcome can spark awareness and action. Quantitative research is often focused on answering the questions of "what" or "how" in regards to a phenomenon, correlation or behavior.

5.8 Limitations:

Each type of research has advantages and disadvantages. Researchers must evaluate their hypotheses as well as the types of data gathering and analysis that are likely to yield the most relevant results.

5.8.1 Qualitative Studies: Pros and Cons:

The qualitative method encourages innovation, multiple interpretations, and adaptability. As more information is acquired, the scope of the research endeavour may vary.

However, qualitative research' conclusions and interpretation are more subjective than quantitative studies'. Personal bias can be difficult to manage, thus the researcher's skill and perspective may greatly influence the interpretation of results and the conclusions reached. Furthermore, due of the expenses and difficulties connected with qualitative data gathering methods, qualitative studies frequently test a lower sample size.

5.8.2 Quantitative Studies: Pros and Cons:

Quantitative studies generate objective data that is free of the subjectivity of qualitative investigations. Statistics and figures can plainly communicate results. With the use of data processing tools, quantitative studies may be produced swiftly.

However, while objectivity is a virtue of the quantitative technique, it might be considered as a more limited style of research. Participants are unable to customise their comments or provide context. Furthermore, statistical analysis necessitates a big data sample, which necessitates a high number of individuals. [3]

5.9 Data Collection Methods:

Various methods can be used to acquire quantitative and qualitative data. It is critical to employ a data collection approach that will aid in answering your research question(s).

Many data collection methods might be qualitative or quantitative in nature. In surveys, observational studies, or case studies, for example, your data can be represented as numbers (e.g., by rating scales or counting frequencies) or as words (e.g., by open-ended questions or descriptions of what you observe).

Some procedures, however, are more typically utilized in one category or the other.

5.9.1 Quantitative Data Collection Methods

- Surveys: A list of closed or multiple-choice questions delivered to a sample (online, in person, or via phone).
- Experiments: A situation in which several factors are controlled and modified in order to identify cause-and-effect linkages.
- Observations: Subjects are observed in their natural setting, where variables cannot be controlled.

5.9.2 Qualitative Data Collection Methods:

- Interviews: Asking open-ended questions to respondents verbally.
- Focus groups: A discussion among a group of people on a topic in order to gain opinions for future research.
- Ethnography: Long-term participation in a community or organisation to closely examine culture and behaviour.
- Literature review: An examination of previously published works by other authors.

5.10 Analyze Qualitative and Quantitative Data:

Qualitative or quantitative data cannot prove or demonstrate anything without being analyzed in respect to the study objectives. Each sort of data requires a different approach of analysis.

5.10.1 Analyzing Quantitative Data:

Numbers are the foundation of quantitative data. To uncover commonalities or trends in the data, simple algebra or more complicated statistical analysis is performed. Graphs and tables are frequently used to present the findings.

Calculations can be performed using applications like as Excel, SPSS, or R.

- Average scores (means)
- The number of times a particular answer was given
- The correlation or causation between two or more variables
- The reliability and validity of the results

5.10.2 Analyzing Qualitative Data:

The analysis of qualitative data is more challenging than that of quantitative data. Instead of numbers, it uses text, graphics, or videos.

The following are some common ways to analyzing qualitative data:

- Qualitative content analysis: Tracking the occurrence, position and meaning of words or phrases
- Thematic analysis: Closely examining the data to identify the main themes and patterns
- Discourse analysis: Studying how communication works in social contexts [4]

5.11 Definition of Qualitative and Quantitative Research:

Qualitative Research:

Based on observation and interpretation of individuals, qualitative research is used to get a knowledge of human conduct, intentions, attitudes, experience, and so on. It is an unstructured and exploratory exercise. A technique for dealing with extremely complicated events. This type of study is typically conducted to gain a thorough understanding of the subject. It is done out by conducting interviews with open-ended questions, describing observations in words, and so on.

Quantitative Research:

The quantitative research approach is based on natural science methods for generating concrete facts and numerical data. It uses various statistical, computational, and statistical methodologies to establish the cause-and-effect link between two variables. This study method is also known as "Empirical Research" since the results are precisely measured. This form of study is typically used to establish broad facts about a certain topic. Surveys, experiments, and other methods are commonly used in this type of research.

5.12 Differences Between Qualitative and Quantitative Research:

Quantitative research is a more methodical approach to problem solving that involves the generation and use of data. This research method is utilized to convert data and variables into real data. Online surveys, print surveys, and other types of surveys are utilized in Quantitative Research to finish the research. [5]

Table 5.1: Differences Between Qualitative and Quantitative Research

Qualitative Research	Quantitative Research
A method for developing a better understanding of human and social sciences, in understanding human behaviour and personalities better	It is the method used to generate numerical data by using a lot of techniques such as logical, statistical and mathematical techniques
It employs a subjective approach	It employs an objective approach
It is generally expressed using words	It is expressed using graphs and numbers
It has open-ended questions	It has multiple choice questions
Qualitative research needs only a few respondents	Quantitative research requires many respondents
The data collection methods involved are interviews, focus groups, literature review, ethnography	The data collection methods involved are experiments, surveys, and observations expressed in numbers
Qualitative research is holistic in nature	Quantitative Research is particularistic in nature
The reasoning used to synthesise data in this research is inductive	The reasoning used to synthesise data in this research is deductive
This method involves a process-oriented inquiry	This method does not involve a process-oriented inquiry
It develops the initial understanding of data	It recommends a final course of action
The data taken in the Qualitative research method is pretty verbal	The data taken in this method is pretty measurable
The objective of this research method is to engage and discover various ideas	The main objective of Quantitative research is to examine the cause and effect between the variables
It is one of the exploratory research methods	It is a conclusive research method

Table 5.2: Differences Between Qualitative and Quantitative Research, synthesize, analyze, and compare [6]:

	Qualitative	Quantitative
Keywords	Complexity, contextual, inductive logic, discovery, exploration	Experiment, random assignment, independent/dependent variable, causal/correlational, validity, deductive logic
Purpose	Understand a phenomenon	Discover causal relationships or describe a phenomenon
Sample	Purposive sample, small	Random sample, large
Data	Focus groups, interviews, field observation	Tests, surveys, questionnaires
Methods/Design	Phenomenological, grounded theory, ethnographic, case study, historical/narrative research, participatory research, clinical research	Experimental, quasi-experimental, descriptive, methodological, exploratory, comparative, correlational, developmental (cross-sectional, longitudinal/prospective/cohort, retrospective/ex post facto/case control)

5.13 Key Differences Between Qualitative and Quantitative Research:

The differences between qualitative and quantitative research are provided can be drawn clearly on the following grounds:

- Qualitative research is a form of investigation that seeks to discover how people think and feel in the human and social sciences. Quantitative research is a scientific and empirical research method that uses statistical, logical, and mathematical techniques to obtain numerical data.
- Qualitative research is more holistic in character, whereas quantitative research is more specific.
- Qualitative research takes a subjective approach because the researcher is intimately involved, whereas quantitative research takes an objective approach because the researcher is uninvolved and attempts to precise the observations and analysis on the topic to answer the inquiry. In contrast to conclusive quantitative research.
- In qualitative research, the logic used to synthesise data is inductive, whereas in quantitative research, the reasoning is deductive.
- Purposive sampling is used in qualitative research to pick a small sample size in order to gain a full knowledge of the target topic. Quantitative research, on the other hand, is based on random sampling, in which a large representative sample is chosen in order to extrapolate the results to the entire population.
- In qualitative research, verbal data is gathered. In contrast, quantitative research collects measurable data.
- In qualitative research, inquiry is process-oriented, whereas quantitative research is not.
- Words, pictures, and objects are employed in qualitative research analysis, whereas numerical data is used in quantitative research analysis.

- Qualitative research is carried out with the goal of investigating and discovering ideas that are employed in ongoing activities. In contrast to quantitative research, the goal of qualitative research is to investigate the cause and effect relationship between variables.
- Finally, qualitative research employs methodologies such as in-depth interviews, focus groups, and so on. In contrast, systematic interviews and observations are used in quantitative research.
- Qualitative research generates preliminary insights, whereas quantitative research proposes a definitive course of action. [7]

5.14 Benefits of Qualitative Research:

- Unlike quantitative research, which is based on numerical data, qualitative research is based on information gathered through interviews, observations, and written texts.
- It is frequently employed in subjects such as sociology and anthropology, where the goal is to comprehend complex social phenomena. • Because it is used to explore a wide range of social elements, qualitative research is thought to be more flexible and adaptive. Furthermore, qualitative research frequently leads to deeper insights into the research study. This aids academics and intellectuals in developing research methodologies.

5.15 Benefits of Quantitative Research:

- Statistical analysis is used to interpret quantitative data. The statistical research is founded on mathematical concepts and gives a quick, concentrated, scientific, and relevant method.
- Quantitative research develops the ability to duplicate research tests and results. This method makes the data more dependable and less subject to debate.
- Expected outcomes indicate which statistical tests are relevant after gathering quantitative data, and results provide a measurable conclusion for the research hypothesis.
- Complex statistical analysis research is seen as valuable and outstanding. Quantitative research is linked to technological breakthroughs such as computer modelling and data-driven judgements.

5.16 Step-wise Guide to Conduct Qualitative and Quantitative Research:

- Recognize the distinctions between research kinds – qualitative, quantitative, or mixed-methods research.
- Construct a research question or hypothesis. This research approach will determine the type of research that can be conducted.
- Select a data gathering method. The type of research could be decided by the data collection process.
- Analyse and analyse the data collected. The results are presented based on the data that has been analysed.

- If the observed results do not match the expected results, try employing an unbiased research methodology or combining qualitative and quantitative research approaches to achieve the desired results. [8]

5.17 The Drawbacks of Qualitative Research:

You're dealing with small sample sizes: Qualitative analysis tends to be more in-depth, which is great, but it's more time-consuming as a result. And because it's resource-intensive, the number of people you can actually speak to is limited. Chances are, you won't survey as many people as you'd like to.

It's harder to generalize the results: Because you're working with a tiny pool of perspectives in any qualitative study, you can't state with certainty that the opinions you got represent the views of a larger community.

You need a skilled qualitative researcher: There are numerous methods to inadvertently impact the results of a qualitative survey, including your tone of voice, relationship with the people you're speaking with, and even the order in which you ask the questions. Unfortunately, the quality of the responses you receive is heavily influenced by how skillfully the researchers conduct their interviews or focus groups.

There's no anonymity: Let's face it: not everyone feels at ease discussing everything with everyone all of the time. Some topics are avoided by people, particularly in one-on-one sessions or discussion groups with strangers.

If this is the case, individuals are more likely to conceal their entire replies if they are embarrassed or judged, which will skew the results of your study. Some people may only be willing to participate in an anonymous quantitative study.

5.18 The Drawbacks of Quantitative Research:

You get a less detailed picture: The outcomes of this study approach are based on numerical responses, which gives you slightly less insight into your group's thoughts, motives, and drivers. You're missing a critical component: context. To avoid this, provide 'open-ended' responses, which allow participants to put down more descriptive responses rather than simply ticking a box. However, this is dependent on respondents having the time and fully understanding the question.

It's somewhat artificial: Quantitative research must be conducted in an unnatural environment in order to be controlled. While this is significant, it also implies that the results you obtain may differ from 'real world' findings.

You're faced with limitations: A quantitative method requires pre-determined answers, and how a person thinks, feels, or behaves may not be on the list. Their true answer is hidden under your lack of options, which may force them to choose one that does not accurately reflect how they feel. [9]

5.19 Conclusion:

An ideal study is one that takes into account both techniques simultaneously. Although there are some specific sectors that require only one style of research, this is primarily determined by the information requested by the researcher. Qualitative research is interpretative, whereas quantitative research is concrete. Acceptance and refinement of the underlying paradigms of qualitative and quantitative research, recognition by funding agencies of the need for both perspectives and a willingness to allocate adequate resources, editorial board awareness of the importance of publishing multimethod research, training of researchers in both paradigms, encouragement of teamwork, and promotion of mutual acceptance and respect by adherents of each approach are examples of these.

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