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**Introduction**

Research methodology is the way researchers describe how they intend to conduct research. It is a logical and systematic plan for solving research problems. The methodology describes a researcher's research approach to ensure reliable and valid results that are consistent with goals and objectives. We explain what data we collect from where and how we collect and analyze it.
Dissertations, articles in scientific journals, or other formal research often detail how researchers approached their research and the methods and techniques they used. When planning a research study, it is helpful to understand what research methods are and the range of techniques and tools available. This article explains what research methodologies are, types of research methodologies, and techniques and tools commonly used to collect and analyze data.

**Body of Assignment**

Research methodology gives validity to research and provides evidence based on science. It also provides a detailed plan to keep researchers on track and make the process smooth, effective, and manageable. Researcher methodology helps readers understand the approaches and methods used to reach conclusions.
Implementing a good research methodology will provide the following benefits:

• Other researchers who want to replicate the study have enough information to do so.
• Criticized researchers can refer to the methodology and explain their approach.
• Helps provide researchers with a specific plan to follow throughout their studies.
• The method design process helps researchers select methods that meet their goals.
• Researchers can document from the start what they want to achieve with their research.

## **Types of research methodology**

When designing a research methodology, researchers have to make several decisions. One of the most important things is what data technique you use: qualitative, quantitative, or a combination of both. Regardless of the type of study, the data collected are presented as numbers or descriptions, allowing researchers to focus on collecting words, numbers, or both.
Various methods and their applications are listed below.
**Qualitative**
Qualitative research involves the collection and analysis of written or spoken word and text data. It can also focus on body language and visual elements, which can help explain the researcher's observations in detail. Researchers typically collect qualitative data through interviews, observations, and focus groups with a small number of carefully selected participants.
This research method is subjective and takes longer than using quantitative data. Researchers often use qualitative methodologies when the purpose of the investigation is exploratory. For example, when conducting research to understand human perception of events, people, or products.
**Quantitative**
Researchers typically use quantitative methods when the goal of their research is to ascertain something. It usually focuses on collecting, testing, and measuring numerical data from a large sample of participants. Then analyze the data using statistical analysis and comparison. Common methods for collecting quantitative data include:

* Surveys
* Questionnaires
* Test
* Databases
* Organizational records

This research methodology is objective and often faster because researchers use software programs to analyze the data. Measuring the relationship between two variables or testing a set of hypotheses is an example of how researchers use quantitative techniques.
**Mixed Methods**
This contemporary research methodology combines quantitative and qualitative approaches to provide additional perspectives, create a richer picture and present multiple results. Quantitative methodologies provide definitive facts and figures, while qualitative methodologies provide the human side. This methodology may produce interesting results as it presents exploratory yet accurate data.

**Types of Sampling Plans in Research Methodologies**

When creating a sampling plan, researchers decide who or what to collect data from. Also, select the techniques and procedures used to select sample objects or people. There are several types of sampling designs, mainly falls into two categories.
**Probabilistic Sampling**

This sampling method draws a random sample from a target pool of people or things. All persons or elements in the population have an equal chance of being selected. Using this method is the best way to obtain a truly representative sample, allowing researchers to generalize their findings to the entire population.
**Non-Probability Sampling**
Non-Probability Sampling is not random because the researcher deliberately selects the people or things to sample. Researchers also call this method intentional sampling, judgmental sampling, or targeted sampling. Not all people or objects in a population are equally likely to be selected, and results generally cannot be generalized to the entire population.

## **Common data collection methods**

Once researchers have collected a sample of the population, they must decide how to collect the data. There are several options for data collection, and the best research method depends on the research topic, methodology, data type, and population sample.
There are many ways to collect data, but it is often loosely grouped as follows:
• Polls: Polls can be conducted online or in person and ask either open-ended essay-style questions or multiple-choice questions. Mixed surveys can also be conducted depending on data requirements.
• Focus Groups: Focus groups allow interviewees to express their thoughts, opinions, perspectives and perceptions on a particular topic. Moderators usually lead the group and lead the discussion, ensuring everyone has a say.
• Observation: Whereas direct observation observes participants' spontaneous behavior without intervention by the researcher, participatory observation is more structured, where the researcher interacts with the participant.
• Documents and Records: Researchers may use data such as reports and official documents issued by international, governmental, and private organizations, as well as internal records such as employee payslips, raw material quantities, and cash receipts. Collect.

## **Common data analysis methods**

Researchers use a variety of data analysis methods, depending on whether the data is qualitative or quantitative. Examples:
**Qualitative Data Analysis**
Qualitative data is usually verbal or written information such as interview transcripts, video and audio recordings, notes, images, and text documents. Qualitative data analysis involves identifying common patterns of participant responses and critically analyzing them to achieve research goals and objectives.
The most commonly used methods in qualitative data analysis are:
• **Narrative Analysis**: Researchers use this method to analyze content from various sources such as interviews, observations, and surveys. It focuses on using people's stories and experiences to answer research questions.
• **Discourse Analysis**: This method analyzes spoken or written language in a social context and aims to understand how people use language in everyday situations.
• **Grounded Theory**: This method uses qualitative data to discover or build a theory that explains why something happened. An explanation is derived using a comparative analysis of data from similar cases in different settings.

### **Quantitative data analysis**

Quantitative data analysis transforms numbers into meaningful data through rational and critical thinking. Most researchers use analytical software to assist with quantitative data analysis. The first step in quantitative data analysis is data validation, preparation, and coding. Once complete, the data is ready for analysis.
The most commonly used quantitative data analysis methods are:
• Descriptive Analysis: This method finds patterns using descriptive statistics such as mean, median, mode, percentage, frequency, and range.
• Inference Analysis: This method uses correlation analysis, regression analysis, and analysis of variance to show relationships between multiple variables.

**Conclusion**

1. Identify the key trends and issues, opportunities and problems you are looking at. Write a sentence describing each.
2. Track how often each of the main findings appears.
3. Make a list of findings, from most common to least common.
4. Evaluate the list of strengths, weaknesses, opportunities and threats identified in the SWOT analysis.
5 Prepare research conclusions and recommendations.
6. Act on the strategy
7. Identify information gaps and consider additional investigation if necessary
8. Review results, analyze and analyze results for interpretation make a plan to consider how

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