

Research Methods (RSC 701)

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Lecture No.7

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Sources of Knowledge

Research Methods

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research
methodology



Content of lecture

The Content of lecture 7 Includes the following:

- 1. What is research methodology?**
- 2. Why is a research methodology important?**
- 3. Types of research methodology.**
- 4. Qualitative.**
- 5. Quantitative.**
- 6. Mixed-method**
- 7. Types of sampling design in research methodology**
- 8. Common data collection methods**
- 9. The most used qualitative data analysis methods**
- 10. Factors to consider when choosing a research methodology**
- 11. How do I choose a research methodology?**
- 12. Tips for writing a strong methodology chapter**

What is research methodology?

Research methodology is a way of explaining how a researcher intends to carry out their research. It's a logical, systematic plan to resolve a research problem. A methodology details a researcher's approach to the research to ensure reliable, valid results that address their aims and objectives. It encompasses what data they're going to collect and where from, as well as how it's being collected and analyzed.



Why is a research methodology important?

A research methodology gives research legitimacy and provides scientifically sound findings. It also provides a detailed plan that helps to keep researchers on track, making the process smooth, effective and manageable. A researcher's methodology allows the reader to understand the approach and methods used to reach conclusions.





Having a sound research methodology in place provides the following benefits:

- Other researchers who want to replicate the research have enough information to do so.
- Researchers who receive criticism can refer to the methodology and explain their approach.
- It can help provide researchers with a specific plan to follow throughout their research.
- The methodology design process helps researchers select the correct methods for the objectives.
- It allows researchers to document what they intend to achieve with the research from the outset

Types of research methodology

When designing a research methodology, a researcher has several decisions to make. One of the most important is which data methodology to use, qualitative, quantitative or a combination of the two. No matter the type of research, the data gathered will be as numbers or descriptions, and researchers can choose to focus on collecting words, numbers or both.



Qualitative

Qualitative research involves collecting and analyzing written or spoken words and textual data. It may also focus on body language or visual elements and help to create a detailed description of a researcher's observations. Researchers usually gather qualitative data through interviews, observation and focus groups using a few carefully chosen participants.



Qualitative

This research methodology is subjective and more time-consuming than using quantitative data. Researchers often use a qualitative methodology when the aims and objectives of the research are exploratory. For example, when they perform research to understand human perceptions regarding an event, person or product



Quantitative

Researchers usually use a quantitative methodology when the objective of the research is to confirm something. It focuses on collecting, testing and measuring numerical data, usually from a large sample of participants. They then analyze the data using statistical analysis and comparisons. Popular methods used to gather



quantitative data are:

- Surveys
- Questionnaires
- Test
- Databases
- Organizational records



This research methodology is objective and is often quicker as researchers use software programs when analyzing the data. An example of how researchers could use a quantitative methodology is to measure the relationship between two variables or test a set of hypotheses.



Mixed-method

This contemporary research methodology combines quantitative and qualitative approaches to provide additional perspectives, create a richer picture and present multiple findings. The quantitative methodology provides definitive facts and figures, while the qualitative provides a human aspect. This methodology can produce interesting results as it presents exact data while also being exploratory.



Types of sampling design in research methodology

When creating a sample design, a researcher decides from who or what they'll collect data. They also choose the techniques and procedures they'll use to select items or individuals for the sample.



There are several types of sample design that fall into two main categories:

- Probability sampling
- Nonprobability sampling



Probability sampling

This sampling method uses a random sample from the pool of people or items you're interested in, called the population, and is random or chance sampling. Every person or item in the population has an equal chance of being selected. Using this method is the best way to get a truly representative sample, and researchers can generalize the study's results to the entire population



Nonprobability sampling

Nonprobability sampling is not random, as the researcher deliberately selects people or items for the sample. Researchers also refer to this method as deliberate sampling, judgment sampling or purposive sampling. Every person or item in the population doesn't have an equal chance of being selected, and the results are typically not generalizable to the entire population.



Common data collection methods

Once a researcher has finalized their population sample, they need to decide how to collect data. There are several options for data collection, and the best research method to use will depend on the research topic, methodology, type of data and the population sample.



Although there are many ways to collect data, people often broadly group them in these ways::

- **Interviews:** Researchers can carry out interviews in a structured, semi-structured, or unstructured format, depending on how formal the questions are.



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- **Surveys:** Surveys can be online or in-person and have either free-answer, essay-style questions, or closed, multiple-choice style questions. Depending on the data required, a survey could also use a mixture.



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- **Documents and records:** Researchers collect data such as published reports and official documents of international bodies, government agencies or private institutes and internal records such as employees' payroll, raw material quantities and cash receipts



Although there are many ways to collect data, people often broadly group them in these ways::

- **Focus groups:** Focus groups have interviewees give their thoughts, opinions, perspectives and perceptions on specific topics. A moderator usually leads the group to help guide the discussion and ensure everyone has a chance to share their thoughts.



Although there are many ways to collect data, people often broadly group them in these ways::

- **Observations:** Direct observation involves observing the spontaneous behavior of participants without interference from the researcher, while participant observation is more structured, and the researcher interacts with the participants.



Common data analysis methods

Researchers use different data analysis methods depending on whether the data is qualitative or quantitative.



Qualitative data analysis

Qualitative data is usually in spoken or written information, such as interview transcripts, video and audio recordings, notes, images and text documents. Qualitative data analysis involves identifying common patterns in participants' responses and critically analyzing them to achieve research aims and objectives



The most used qualitative data analysis methods are:

- **Content analysis:** This is one of the most common methods used to analyze documented information and is usually used to analyze interviewees' responses.
- **Narrative analysis:** Researchers use this method to analyze content from several sources, including interviews, observations and surveys. It focuses on using people's stories and experiences to answer research questions



The most used qualitative data analysis methods are:

- **Discourse analysis:** This method analyzes spoken or written language in its social context and aims to understand how people use language in day-to-day situations.
- **Grounded theory:** This method uses qualitative data to discover or construct a theory explaining why something happened. It uses a comparative analysis of data from similar cases in different settings to derive explanations.



The most used quantitative data analysis methods are:

- **Descriptive analysis:** This method uses descriptive statistics like mean, median, mode, percentage, frequency and range to find patterns.
- **Inferential analysis:** This method shows the relationships between multiple variables using correlation, regression and variance analysis



Quantitative data analysis

Quantitative data analysis involves turning numbers into meaningful data by applying rational and critical thinking. Most researchers use analytical software to assist with quantitative data analysis. The first stage in analyzing quantitative data is validating, editing and coding the data. Once completed, the data is ready for analysis.



Factors to consider when choosing a research methodology

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

- **The research objective:** Consider the research project objective. When researchers know what information, they require at the end of the project to meet their objectives, it helps them select the correct methodology and research method.
- **Significance of statistics:** Another factor to consider is whether you require concise, data-driven research results and statistical answers. Or whether the research questions require an understanding of reasons, perceptions, opinions and motivations.



- **Nature of the research:** If the aims and objectives are exploratory, the research will probably require qualitative data collection methods. However, if the aims and objectives are to measure or test something, the research will require quantitative data collection methods.
- **Sample size:** How big does the sample need to be to answer the research questions and meet the objectives? The sample size can determine your data-gathering methods, such as whether to use in-person interviews or smaller samples or online surveys for larger ones



•**Time available:** If there are time constraints, consider techniques like random or convenience sampling and tools that allow for data collection in a few days. If there's more time available for data collection, in-person interviews and observations are possible.



How do I choose a research methodology?

As you've probably picked up by now, your **research aims, and** objectives have a major influence on the research methodology. So, the starting point for developing your research methodology is to take a step back and look at the big picture of your research, before you make methodology decisions. The first question you need to ask yourself is whether your research is **exploratory** or **confirmatory** in nature.



How do I choose a research methodology?

If your research aims and objectives are primarily exploratory in nature, your research will likely be qualitative and therefore you might consider qualitative data collection methods (interviews) and analysis methods (qualitative content analysis).



How do I choose a research methodology?

Conversely, if your research aims and objective are looking to measure or test something (they're confirmatory), then your research will quite likely be quantitative in nature, and you might consider quantitative data collection methods (surveys) and analyses (statistical analysis).



How do I choose a research methodology?

Designing your research and working out your methodology is a large topic, which we'll cover in other posts. For now, however, the key takeaway is that you should **always start with your research aims and objectives**. Every methodology decision will flow from that.



Tips for writing a strong methodology chapter

Remember that your aim is not just to describe your methods, but to show how and why you applied them. Again, it's critical to demonstrate that your research was rigorously conducted and can be replicated



1. Focus on your objectives and research questions

The methodology section should clearly show why your methods suit your objectives and convince the reader that you chose the best possible approach to answering your problem statement and research questions.

2. Write for your audience

Consider how much information you need to give, and avoid getting too lengthy. If you are using methods that are standard for your discipline, you probably don't need to give a lot of background or justification.

Regardless, your methodology should be a clear, well-structured text that makes an argument for your approach, not just a list of technical details and procedures



3. Cite relevant sources

Your methodology can be strengthened by referencing existing research in your field. This can help you to:

- Show that you followed established practice for your type of research
- Discuss how you decided on your approach by evaluating existing research
- Present a novel methodological approach to address a gap in the literature



