RESEARCH DESIGN

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Kripa-Drishti Publications, Pune.

Book Title: **Research Design**

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1st Edition

ISBN: **978-81-19149-41-4**

Published: **Dec 2023**

Publisher:

Kripa-Drishti Publications

A/ 503, Poorva Height, SNO 148/1A/1/1A,
Sus Road, Pashan- 411021, Pune, Maharashtra, India.
Mob: +91-8007068686
Email: editor@kdpublications.in
Web: https://www.kdpublications.in

PREFACE

Qualitative, Quantitative, and Mixed Methods Research Design Approaches offers precise guidance on how to create research projects and research proposals. Readers are guided through the research methods process in this approachable text, which includes reading through relevant literature, formulating research questions and hypotheses, and designing the study. Authors John W. and J. David Creswell encourage readers to select the approach that best suits the research question by outlining qualitative, quantitative, and mixed methods approaches at each stage of the process.

With the help of exercises, real writing samples, and walkthrough experiences, **Research Design** is an approachable and helpful book that engages students. This book helps students understand when to use mixed methods by modelling the kinds of problems that work best for various approaches. Moreover, the way in which theory and paradigms are emphasised aids students in understanding their significance.

The book then discusses the essential components of conducting research, including developing methods and procedures for data collection and analysis, identifying research questions and hypotheses, stating a purpose for the study, and writing an introduction. Students and faculty who need help creating a plan or proposal for an academic journal article, dissertation, or thesis will find the book helpful. Key components include: a glossary of terms at the end of the book to give readers a working language for understanding research; an abundance of examples from a variety of disciplines and from books, journal articles, dissertation proposals, and dissertations; and a companion website with a wealth of resources for both students and teachers to use for independent study.

CONTENT

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1. Research Design

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Abstract:

A research design is a broad plan that states objectives of research project and provides the guidelines what is to be done to realize those objectives. It is, in other words, a master plan for executing a research project. Research design is the framework of research methods and techniques chosen by a researcher to conduct a study. The design allows researchers to sharpen the research methods suitable for the subject matter and set up their studies for success.

1.1 Introduction:

This chapter discusses in detail the methodological choice and the research design process of the study. It has mainly relied on the philosophical stance and the research problem to guide on the methodological choice. More, specifically, it explains why explanatory sequential mixed methods research approach is considered appropriate for the research. The word 'design' has various meanings. But, in relation to the subject concern, it is a pattern or an outline of research project's workings.

It is the statement of essential elements of a study that provides basic guidelines of conducting the project. It is same as the blue print of architect's work. The research design is similar to broad plan or model that states how the entire research project would be conducted. It is desirable that it must be in written form and must be simple and clearly stated. The real project is carried out as per the research design laid down in advance.

1.2 Process of Research Design:

The research process entails a number of organized steps that a researcher must take in order to provide knowledge that will be valued by the project and concentrate on the pertinent topic. Basic and applied research can be conducted in a variety of ways. The following steps outline a simple and effective process for conducting both basic and practical research. The five (5) steps in the research process are:

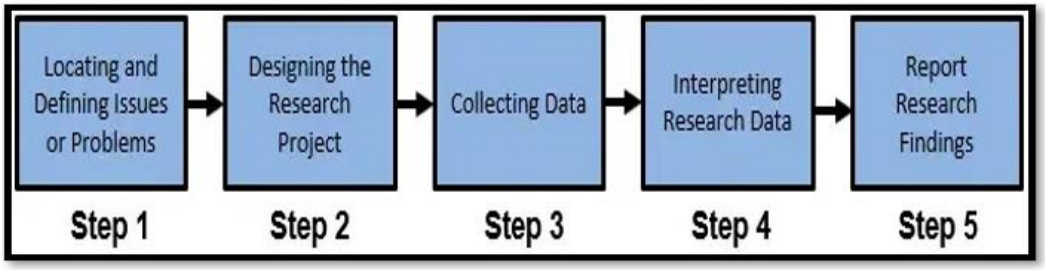

Figure 1.1: Process Of Research Design

Step 1 – Locating and Defining Issues or Problems:

This step focuses on uncovering the nature and boundaries of a situation or question that needs to be answered or studied. In defining the issues or problems, the researcher should take into account the purpose of the study, the relevant background information, what information is needed, and how it will be used in decision-making. A well-defined problem will help the researcher through all steps of the research process**,**

Step 2 – Designing the Research Project:

This step is focused on creating a research plan or overall approach to how you are going to solve the issue or problem identified. A research plan or approach is a framework or blueprint for conducting a research project.

The research design involves the following steps:

- Step 1: Conduct secondary data analysis

- Step 2: Do qualitative research
- Step 3: Determine methods of collecting quantitative data (survey, observation, and experimentation)
- Step 4: Determine the definition of the information needed
- Step 5: Determine measurement and scaling procedures
- Step 6: Design a questionnaire
- Step 7: Sampling process and sample size
- Step 8: Plan of data analysis

Step 3 – Collecting Data:

This step revolved around obtaining the information needed to solve the identified issue or problem. Data collection can involve experiments, observations, personal interviewing (in-home, mall intercept, or computer-assisted personal interviewing.

Data collection techniques can include:

- Interviews: Asking people questions about their known information
- Observations: collecting data without asking questions.
- Questionnaires: Ask questions among a group of people
- Focus Groups: Interviewing and observing a group of people

Step 4 – Interpreting Research Data: This step is focused on interpreting and examining the research data and coming up with a conclusion that solves the problem. Make sure the conclusion is easy to understand and well thought out based on the data collected.

Analysis Steps:

- Step A: Review your research plan
- Step B: Organize your finding and the information you have collected from Step 3.
- Step C: Create a rough draft of your finding, recommendations, and conclusion. The rough draft will help you get your thoughts organized.

- Step D: Polish the rough draft into your final research finding. You will most likely revise the draft many times before the final product is ready for Step 5.

Step 5 – Report Research Findings

The final step is to report the research findings to those who need the data to make decisions. The findings should be presented in an understandable format so that they can be readily used in the decision-making process. In addition, an oral presentation should be made to management using tables, figures, and graphs to enhance clarity and impact.

Research Reporting Formats:

- Formal Paper
- Published Article
- PowerPoint Presentation
- Audio or Video
- Spreadsheet

1.3 Need and Importance of Research Design:

Research design carries an important influence on the reliability of the results attained. It therefore provides a solid base for the whole research. It is needed due to the fact that it allows for the smooth working of the many research operations. This makes the research as effective as possible by providing maximum information with minimum spending of effort, money and time.

For building of a car, we must have a suitable blueprint made by an expert designer. In a similar fashion, we require a suitable design or plan just before data collection and analysis of the research project.

Planning of design must be carried out cautiously as even a small mistake might mess up the purpose of the entire project. The design helps the investigator to organize his ideas, which helps to recognize and fix his faults, if any.

In a **good research design**, all the components go together with each other in a coherent way. The theoretical and conceptual framework must with the research goals and purposes. In the same way, the data gathering method must fit with the research purposes, conceptual and theoretical framework and method of data analysis.

The importance of research design in research methodology is due to the following:

- It may result in the preferred kind of study with helpful conclusion.
- It cuts down on inaccuracy.
- Allows you get optimum efficiency and reliability.
- Reduce wastage of time.
- Reduce uncertainty, confusion and practical haphazard related to any research problem.
- Of great help for collection of research material and testing of hypothesis.
- It is a guide for giving research the right path.
- Gets rid of bias and marginal errors.
- Provides an idea concerning the type of resources needed in terms of money, effort, time, and manpower.
- Smooth & efficient sailing (sets boundaries & helps prevent blind search)
- Maximizes reliability of results.
- Provides firm foundation to the endeavor.
- Averts misleading conclusions & thoughtless useless exercise.
- Provides opportunity to anticipate flaws & inadequacies (anticipates problems).
- Incorporates by learning from other people's critical comments & evaluations.

1.4 Research Design Types:

A researcher must clearly understand the various types to select which model to implement for a study. Like research itself, the design of your analysis can be broadly classified into quantitative and qualitative.

- **Qualitative research:** It determines relationships between collected data and observations based on mathematical calculations. Statistical methods can prove or

disprove theories related to a naturally existing phenomenon. Researchers rely on qualitative observation research methods that conclude "why" a particular theory exists and "what" respondents have to say about it.

- **Quantitative research:** It is for cases where statistical conclusions to collect actionable insights are essential. Numbers provide a better perspective for making critical business decisions. Quantitative research methods are necessary for the growth of any organization. Insights drawn from complex numerical data and analysis prove to be highly effective when making decisions about the business's future.

Qualitative Research vs Quantitative Research:

Here is a chart that highlights the major differences between qualitative and quantitative research:

Table 1.1: Qualitative Research vs Quantitative Research

Qualitative Research	**Quantitative Research**
Focus on explaining and understanding experiences and perspectives.	Focus on quantifying and measuring phenomena.
Use of non-numerical data, such as words, images, and observations.	Use of numerical data, such as statistics and surveys.
Usually uses small sample sizes.	Usually uses larger sample sizes.
Typically emphasizes in-depth exploration and interpretation.	Typically emphasizes precision and objectivity.
Data analysis involves interpretation and narrative analysis.	Data analysis involves statistical analysis and hypothesis testing.
Results are presented descriptively.	Results are presented numerically and statistically.

You can further break down the types of research design into five categories:

Figure 1.2: Types of Research Design

A. Descriptive:

In a descriptive composition, a researcher is solely interested in describing the situation or case under their research study. It is a theory-based design method created by gathering, analyzing, and presenting collected data.

This allows a researcher to provide insights into the why and how of research. Descriptive design helps others better understand the need for the research. If the problem statement is not clear, you can conduct exploratory research.

B. Experimental:

Experimental research establishes a relationship between the cause and effect of a situation. It is a causal research design where one observes the impact caused by the independent

variable on the dependent variable. For example, one monitors the influence of an independent variable such as a price on a dependent variable such as customer satisfaction or brand loyalty. It is an efficient research method as it contributes to solving a problem.

C. Correlational research:

Correlational research is a non-experimental research technique. It helps researchers establish a relationship between two closely connected variables. There is no assumption while evaluating a relationship between two other variables, and statistical analysis techniques calculate the relationship between them.

1.4 Benefits of Research Design:

There are several benefits of having a well-designed research plan. Including:

- **Clarity of research objectives:** Research design provides a clear understanding of the research objectives and the desired outcomes.
- **Increased validity and reliability:** To ensure the validity and reliability of results, research design help to minimize the risk of bias and helps to control extraneous variables.
- **Improved data collection:** Research design helps to ensure that the proper data is collected and data is collected systematically and consistently.
- **Better data analysis:** Research design helps ensure that the collected data can be analyzed effectively, providing meaningful insights and conclusions.
- **Improved communication:** A well-designed research helps ensure the results are clean and influential within the research team and external stakeholders.
- **Efficient use of resources:** reducing the risk of waste and maximizing the impact of the research, research design helps to ensure that resources are used efficiently.

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ISBN: 978-81-19149-41-4

2. Types of Research Design: Perspective and Methodological Approaches

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Abstract:

The goal of this paper is to develop the research methodology using a variety of research approaches. The research methodology aids the researcher in discovering the study findings. The overall structure of the study and the data gathering techniques are thoroughly detailed in this chapter. There are three primary sections to it. The dissertation design is highlighted in the first section. The second section talks about how to acquire data in both qualitative and quantitative ways. The overall research framework is illustrated in the final section. Types of Research Design: Perspective and Methodological Approaches will be covered in this essay.

Keywords:

Research Design, Perspective, Methodological, Approaches, Result Findings, Quantitative, Data Collection, Analyze, Experimental Research, Case Study Research, Design Process, Evaluation, Reporting, Mixed Methods

2.1 Introduction:

The methodical, scientific process used to gather, analyze, and evaluate data in order to find answers to research questions or validate hypotheses is referred to as research methodology. Depending on the nature of the research question, the resources at their disposal, and the objectives of the study, researchers may choose from a variety of research methodology types. Quantitative research, qualitative research technique, mixed-method research, experimental research, and case study research are a few examples of common research methodology kinds. [1]

The goal of the research design is to offer a suitable framework for a study. The decision to be made regarding the research approach is very important since it affects how pertinent data for a study will be acquired; yet, the research design process comprises several interrelated considerations.

Organizational research challenges frequently impact study designs rather than the other way around. The tools to be used and how they will be applied are both chosen while developing a research endeavor.

In research design, you specify how to combine every component of the study into a coherent, logical structure. By doing this, you may be sure that your research will properly address the intended issue.

In essence, it establishes the framework for data gathering, analysis, and reporting. Remember that the research problem will determine the design you select.

2.2 Research Methods:

The method chosen by the researcher to gather, examine, and interpret data is known as a research methodology. There are three types of research methods: mixed, qualitative, and quantitative.

In quantitative research, numerical data are gathered and analyzed to characterize, explain, forecast, or control relevant occurrences. Numerical data processing is a challenging task that requires a systematic approach. Deductive reasoning is used in quantitative research. [2]

The goal of qualitative research is to better understand a particular phenomenon of interest by gathering, analyzing, and interpreting extensive narrative and visual evidence. Qualitative research aims to understand phenomena as they naturally occur by simultaneously examining a variety of its facets. Utilizing inductive reasoning, this strategy.

Through the use of both quantitative and qualitative data in a single study, mixed methods research integrates these two methodologies.

Research Design

The relationship and strength between quantitative and qualitative research approaches can be strengthened through the use of mixed methods research by the researcher. This makes it possible to comprehend the topic under study better.

Plans and procedures for conducting research are known as research approaches, and they cover everything from general hypotheses to specific techniques for gathering, analyzing, and interpreting data. There are a number of choices in this approach, and they don't all have to be made in the sequence I think they make sense and in which they are presented here.

Which method should be employed to study a subject is the main decision. This choice should be based on the researcher's philosophical presuppositions, the research design, and the specific data collecting, analysis, and interpretation techniques used in the study.

The type of study topic or issue being addressed, the researchers' own experiences, and the intended audiences all play a role in the choice of a research approach study.

Advancements have been made in three research methodologies:

(a) qualitative; (b) quantitative; and (c) mixed methods. Without a doubt, the three methods are not as distinct as they first seem. It's important to remember that qualitative and quantitative techniques are not polar opposites, inflexible classifications, or dichotomies. Instead, they stand for various points along a continuum. [3]

A method for investigating and comprehending the meaning that individuals or groups assign to a social or human situation is qualitative research. Inductively growing from specifics to broad themes, data analysis, data interpretation, and emergent questions and processes are all part of the research process. Data are often acquired in participant settings. The final report's structure is adaptable.

A method for testing objective hypotheses by looking at the relationship between variables is quantitative research. To enable statistical analysis of numbered data, these variables can be measured, often using instruments. The introduction, literature and theory, methodology, results, and commentary make up the predetermined format of the final written report.

An approach to study known as mixed methods research involves gathering both quantitative and qualitative data, integrating the two types of data, and employing unique designs that may include philosophical presumptions and theoretical frameworks. [4]

This type of study is predicated on the fundamental premise that combining qualitative and quantitative methods yields a better knowledge of a research problem than each method by itself.

Table 2.1: Research Approaches

Quantitative	Qualitative	Mixed Methods
• Experimental designs • Nonexperimental designs, such as surveys	• Narrative research • Phenomenology • Grounded theory • Ethnographies • Case study	• Convergent • Explanatory sequential • Exploratory sequential • Transformative, embedded, or multiphase

Table 2.2: Quantitative, Mixed, and Qualitative Methods:

Quantitative Methods	Mixed Methods	Qualitative Methods
Pre-determined	Both predetermined and emerging methods	Emerging methods
Instrument based questions	Both open- and closed-ended questions	Open-ended questions
Performance data, attitude data, observational data, and census data	Multiple forms of data drawing on all possibilities	Interview data, observation data, document data, and audiovisual data
Statistical analysis	Statistical and text analysis	Text and image analysis
Statistical interpretation	Across databases interpretation	Themes, patterns interpretation

A. Quantitative Approach:

Experimental strategy, pretest and posttest attitude measurements, and a postpositivist worldview In this case, the researcher verifies a theory by defining specific hypotheses and gathering information to confirm or deny the assumptions.

Research Design

Attitudes are evaluated both before and after an experimental treatment using an experimental methodology. The information is examined using statistical techniques and hypothesis testing after being collected on an attitude-measuring equipment. [5]

For most introductory-level research students, a quantitative method to research is likely the one they are most familiar with. The quantitative approach, which emerged from the natural sciences (such as chemistry and biology), is framed by the idea of realism, which holds that there is only one reality or truth that needs to be discovered. As a result, it's important to ask the "right" questions.

Furthermore, this viewpoint is outcome-oriented because it promotes observable causes and effects. Aggregate data is frequently utilized to uncover patterns and the "truth" about the topic being researched. The capacity to forecast the phenomenon determines true comprehension.

B. Qualitative Approach:

Constructivist worldview, ethnographic design, and behavior observation are used by the researcher to ascertain a phenomenon's meaning through the perspectives of participants in this setting. This entails locating a community that shares a culture and investigating how it evolves over time into a shared set of behavioral patterns (ethnography). The observation of participant behavior while they are participating in activities is one of the crucial components of data collection in this manner. The qualitative approach is the opposite of quantitative research methods. [6] The common consensus is that this is the quantitative approach's polar opposite. Phenomenologists, or researchers who focus on people, include qualitative researchers. Any study must take into account the participants' humanness, which includes their ideas, feelings, and experiences. The constructionist perspective holds that knowledge is made, not discovered, and that there are numerous realities based on one's perspective, as opposed to a realist perspective which suggests one reality or truth.

A researcher specifically wants to comprehend why, how, and who a phenomena relates to. Since these characteristics involve a person's thoughts, feelings, and experiences, they are typically impossible to observe.

Most crucially, they are determined by how they see those things, not by how an outside researcher sees them. As a result, unlike with the quantitative approach, there is no such thing as a neutral or impartial outsider.

C. Mixed Methods Approach:

Using a pragmatic worldview, the researcher bases the design of the study on the presumption that collecting a variety of data types is the most effective way to provide a more comprehensive understanding of a research problem than either quantitative or qualitative data alone.

Table 2.3: Types of Approaches

Tend to or Typically	Qualitative Approaches	Quantitative Approaches	Mixed Methods Approaches	
Use these philosophical assumptions	Constructivist/ transformative knowledge claims	Post-positivist knowledge claims	Pragmatic knowledge claims	
Employ these strategies of inquiry	Phenomenology, grounded theory, ethnography, case study, and narrative	Surveys and experiments	Sequential, concurrent, and transformative	
Employ these methods	Open-ended questions, emerging approaches, text or image data	Closed-ended questions, predetermined approaches, numeric data	Both open- and closed-ended questions, both emerging and predetermined approaches, and both quantitative and qualitative data and analysis	*Use these practices of research as the researcher*

The research methodology is a strategy and process that progresses from general hypotheses to specific techniques for gathering, analyzing, and interpreting data. Therefore, it is determined by the type of research problem being addressed.

The research strategy is basically split into two types [7]:

- The approach of data collection and

- The approach of data analysis or reasoning.

Types of research approach for data collection:

- Focuses on a single concept or phenomenon
- Brings personal values into the study
- Studies the context or setting of participants
- Validates the accuracy of findings
- Makes interpretations of the data
- Collaborates with the participants
- Tests or verifies theories or explanations
- Identifies variables to study
- Relates variables in questions or hypotheses
- Uses standards of validity and reliability
- Observes and measure information numerically
- Uses unbiased approaches
- Employs statistical procedures
- Collects both quantitative and qualitative data
- Integrates the data at different stages of inquiry
- Presents visual pictures of the procedures in the study
- Employs the practices of both qualitative and quantitative research

2.3 Research Perspectives:

Data collection is necessary for social science research in order to comprehend a phenomenon. Depending on the level of prior knowledge in the field, this can be accomplished in a variety of methods. The researcher may.

- Look into a little-known problem. Exploratory research is conducted when a researcher has an idea or has noticed something and wants to learn more about it.
- Make connections between concepts to comprehend the connections between various parts of a problem, i.e., to explain what is happening (explanatory research).

- Provide a more thorough explanation of what is occurring and deepen the original comprehension (explanatory or descriptive research). [8]

Exploratory research is frequently conducted through observation as well as other techniques that allow the researcher to obtain initial data, such as interviews or questionnaires. Contrarily, explanatory research typically investigates theories regarding cause-and-effect connections. The statements that the researcher will test during the research are known as hypotheses.

The difference between inductive and deductive research is related to the difference between exploratory and explanatory research. Inductive methods are more common in exploratory research than deductive methods in explanation-based studies. Although this isn't usually the case, we won't discuss the exceptions here for the sake of simplicity.

A descriptive study could assist an explanatory or exploratory investigation. Descriptive research is insufficient for an academic project on its own. The goal of academic study is to advance our existing understanding. [9]

The researcher's point of view also depends on whether they think there is an objective universe that can be known objectively; for instance, profit can be seen as an objective indicator of how well a company is doing. Alternately, the researcher can think that terms like "culture," "motivation," "leadership," and "performance" are the products of human categorization of the universe and that their "meaning" varies according to the situation.

Performance, for instance, can have varied meanings to many individuals. One possibility is that it alludes to a concrete indicator like sales numbers.

For another, it can entail having positive interactions with customers. This latter perspective contends that a researcher may only adopt a subjective viewpoint because the nature of these notions is a product of human activities.

In general, the term "subjective research" refers to the subjective experiences of research subjects as well as the fact that the perspective of the researcher is integrated into the research process rather than being completely distinct from it. [10]

2.4 Research Methodology:

This study combined primary and secondary sources with quantitative and qualitative research approaches. The analysis and findings from the quantitative data are supported by the qualitative data. Since the researcher used both qualitative and quantitative data types in the data analysis, the outcome is triangulated.

This section covered the study area, data sources, and sample methods. In plain English, research technique is utilized to provide a precise understanding of the purpose of the researcher's investigation. Research methodology creates the ideal platform for the researcher to map out the research work in relevance to make sound plans at the correct moment and advance the research effort. [11]

Additionally, research technique encourages the researcher to get involved and take an active role in the area of investigation. Most of the time, the purpose of the research and the research topic will vary depending on the goals and direction of the study, however this may be accomplished by using an appropriate technique.

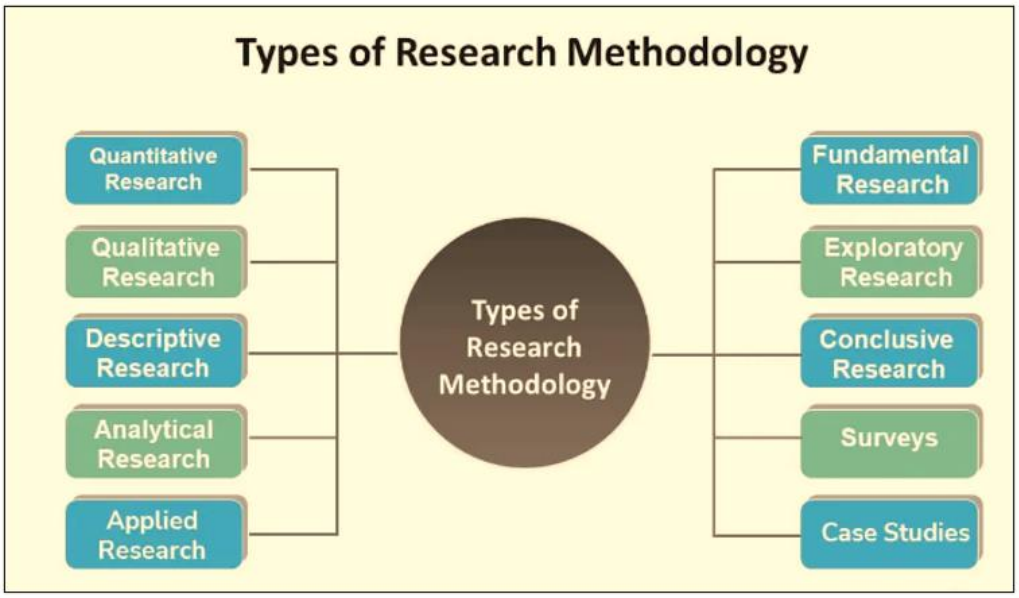

Figure 2.1: Types of Research Methodology

Characteristics of Good Research Design:

As a result, be certain that the study strategy you choose is extremely appropriate because the perfect decision will lead to outcomes that are pertinent.

The research design itself is made up of a number of sections, albeit its length and complexity might vary. Keep in mind that the research challenge will determine the type and components of the research strategy. These parts are:

- Purpose statement (the central research problem)
- Data collection and analysis
- Statistical method to analyze data
- Settings for the study
- Timeline
- Probable objections
- Validating the data [12]

2.5 Types of Research Design:

- **Collecting Descriptive Information:**

With care taken not to in any way affect people or events, descriptive research comprises qualitative research techniques that describe things as they actually occur. Social scientists utilize descriptive and open-ended survey research designs to examine human behavior, market analysts to examine consumer perceptions, and companies looking for information on consumer perceptions of specific brands. It is possible to determine which variables would benefit from quantitative testing using descriptive research.

- **Conducting Experimental Studies:**

From a scientific perspective, experimental research procedures are thought to be the most accurate type of research. It uses statistical analysis to try to numerically support or refute a theory, and is typically used in the physical sciences.

Due to the rigorous structure of this design, objections against the correctness of the results are significantly diminished because results can be statistically examined, repeated, and validated by other researchers.

- **Incorporating Quasi-Experimental Design:**

Quasi-experimental research methods, which are popular in the social sciences and psychology, lack a control group, which makes accurate statistical analysis challenging. However, the data produced by these experiments may be helpful in identifying broad trends. They are useful for gaining an overall picture that can be followed by a quantitative analysis or a case study that focuses on the underlying causes of the produced outcomes.

Undertaking Historical Research:

Since a historical research plan takes into account elements like origins, growth, theories, and important figures, it can be used in any subject of study. It can gather historical data that is both quantitative and qualitative. Primary sources, or first-person accounts, are the ones that historians regard the most. These include eyewitness stories, personal diaries, and oral history interviews and recordings.

- **Making Field Observations:**

For ethical reasons, observational research compares people in circumstances where the researcher has minimal direct control over the experiment. For instance, it would be unethical to ask a group of otherwise healthy individuals to smoke for 20 years in order to compare them with the control group of non-smokers when comparing the life expectancy of smokers and non-smokers.

2.6 Examining a Case Study:

A case study is a type of qualitative research that focuses on a specific issue rather than conducting a general statistical survey. It concentrates a wide field of inquiry into a single instance. Scientific investigations constantly rely on factual facts to strengthen the body of evidence.

However, there are occasions when it may be necessary for researchers to gather subjective data because of limitations in obtaining objective data from study participants as well as the nature of the study's objectives. In these circumstances, qualitative and mixed method designs are important; the field is similar in the medical and related sciences. In medical and nursing research, the use of qualitative research designs and mixed-method techniques is on the rise. Contribution to the evidence-based pyramid is a crucial question when these study approaches are preferred. However, mixed techniques are used in a specific circumstance where researchers need to evaluate study participants' perspectives, opinions, and outlooks on particular occurrences. Since the process of gathering data on subjective views, opinions, and beliefs is so complicated, potential information may be overlooked during the study.

Approaches to Research:

The area of social work, which focuses on families and individuals, will benefit more from qualitative study than it will from quantitative research into the processes of an organic chemical reaction. While some research benefits from one of the two ways, some research benefits more from a mixed strategy since it produces deeper insight. In actuality, there are some significant similarities between qualitative and quantitative research methods. The steps of the scientific process are generally followed by every sort of research, specifically:

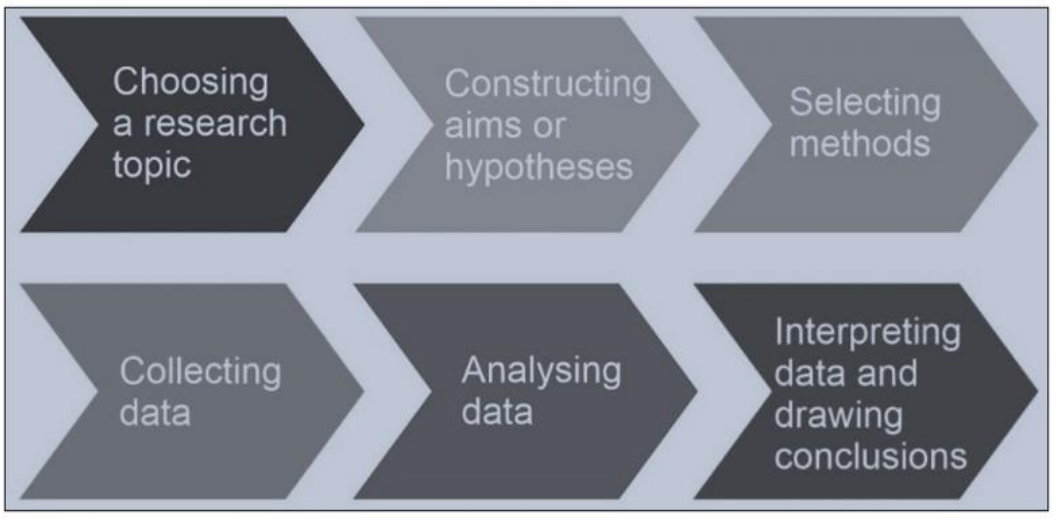

Figure 2.2: Types of Research

Research Design

Each strategy starts with a hypothesis based on a value judgment or on qualitative reasoning. Both inductive and deductive reasoning skills can be used to apply or translate these judgments into quantitative terms. Both can be extremely extensive, but qualitative research has more latitude in terms of how much detail it provides. [13]

2.7 Conclusion:

It's crucial to keep in mind that your study's design is outlined in the research design. This plan will lay all the required groundwork for the study and produce more fruitful findings. Write down all the discussion topics, goals, and participants in the audience. Understanding various research perspectives, the topics that need to be taken into account when planning the project (ethics, research design, research strategy, and research methodology) have been discussed, as well as the various perspectives (subjective/objective and interpretivist/ positivist) that a researcher can take in investigating a problem.

The procedures and data sources for data collecting were employed. The whole research methodologies and framework, including all the parameters, are specified throughout the study process, from problem creation to problem validation. For researchers, it has laid some groundwork for how study technique is designed and structured.

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ISBN: 978-81-19149-41-4

3. A Review of Research Design

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Abstract:

The research design is a vital part of research. Reviews of research design are studied here in this paper. The design and implementation of research involve two types human experimentation, animal experimentation. Research design entails a process or template of finding definitive answers to research problem and questions. In this attempt a researcher employs two major types of research design; qualitative and quantitative. In the construction of research design the researcher is expected to bear in mind the features in both the qualitative, quantitative and the combination of the two (mixed) methods. The research design is a vital part of research. Reviews of research design are studied here in this paper. The design and implementation of research involve two types human experimentation, animal experimentation. This type of research aims mainly discovering the fundamental motive and needs, using in increase the strength interviews for a particular the purpose. Review in the process of research design, and how to develop a research practice that will build skills in reading and writing about research literature—skills that remain valuable in both academic and professional careers. Literature review is approached as a process of engaging with the discourse of scholarly communities that will help graduate researchers refine, define, and express their own scholarly vision and voice. In this paper we will discuss A Review of Research Design.

Keywords:

Review, Research Design, Experimentation, Qualitative, Quantitative, Hypothesis, Literature, Research Infrastructure, Design Elements, Sampling, Data Collection, Data Analysis, Research Methodology.

3.1 Introduction:

Research is a watchful examination or query especially all the way during the search for original data in some branch of information. It is the methodical step regarding simplification and the formulation of a hypothesis. Research is organized attempt to increase original information. Research design entails a process of finding a definitive answer to research questions. In an attempt to do so, a researcher may employ two major types of research design; qualitative and quantitative. [1]

Features of Research Design The identification of a problem and formulation of the research questions is the starting point of a research design based on these two crucial steps the researcher can move on to make the research design that attempts to answer the research question. A good research design minimizes bias and maximizes the reliability of the data for the study. More often one design is not applicable to all studies therefore in constructing the design the following features are pertinent.

Figure 3.1: An appropriately chosen, well-executed research design helps researchers conduct high-quality research. (Image by rawpixel.com on Freepik)

3.2 Review of Research Design:

A research design is a systematic elucidation of the whole research process that includes methods and techniques, starting from the planning of research, execution (data collection), analysis, and drawing a logical conclusion based on the results obtained.

A research design is a framework developed by a research team to find an answer/solution to a problem.

The research designs are of several types that include descriptive research, surveys, correlation type, experimental, review (systematic/literature), and meta-analysis. [2]

The choice of research design is determined by the type of research question that is opted for. Both the research design and the research question are interdependent.

For every research question, a complementary/appropriate research design must have been chosen. The choice of research design influences the research credibility, reliability, and accuracy of the data collected.

A well-defined research design would contain certain elements that include a specific purpose of the research, methods to be applied while collecting and analyzing the data, the research methodology used to interpret the collected data, research infrastructure, limitations, and most importantly, the time required to complete the research.

The research design can broadly be categorized into two types: qualitative and quantitative designs. In a qualitative research method, the collected data are measured and evaluated using mathematical and statistical applications.

Whereas in quantitative research, a larger sample size is selected, and the results derived from statistics can benefit society.

The various types of research designs are shown in Figure 2 [3]

Figure 3.2: Types of Research Design

3.3 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 research refers to the methodical technique consisting of express the difficulty, prepare a hypothesis and accumulate the information or data, analyzing the information and realization positive termination each in the form of solutions towards the concerned difficulty or in assured generalizations for several hypothetical formulations which may be key factor of entrepreneurship.

Research is blind without assumption, so all research is generally based on assumption, about how best one is understood and the world has perceived. Almost two millennia philosophers have been arguing about the various question now a time to know how present social researchers approaching world around.

The aforementioned qualities are one of the major vital concerns in research work. Base on the research project the idea of validity to discuss for quality conclusion of a research. [4]

Maximum number of the students are rolling their eye and curl up into fatal position when discuss about the validity, because it is like an abstract and philosophical.

If any researcher could understand the principle that used to judge quality of research by validity, then he or she would do much more than the expected research project once that completed. Researchers must have been expert at research to assure quality research.

3.4 Research Design:

The research design is intended to provide an appropriate framework for a study. A very significant decision in research design process is the choice to be made regarding research approach since it determines how relevant information for a study will be obtained; however, the research design process involves many interrelated decisions.

This study employed a mixed type of methods. The first part of the study consisted of a series of well-structured questionnaires (for management, employee's representatives, and technician of industries) and semi-structured interviews with key stakeholders (government bodies, ministries, and industries) in participating organizations. The other design used is an interview of employees to know how they feel about safety and health of their workplace, and field observation at the selected industrial sites was undertaken. [5]

Research design talks about the overall strategy that you choose to logically integrate the various elements of your research so to make sure that you deal with the research issues efficiently.

Data collection for your research has two parts – Primary Data Collection and Secondary Data Collection. Primary data collection can be done from various sources like workplace, interview, questionnaires, and expert opinion.

Secondary data collection involves literature review, reports etc. Research is defined as a systematic, controlled, empirical and critical investigation of hypothetical propositions about the natural phenomenon. Research process consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps. [6]

Research is a Cyclic Process:

- It consists of number of closely related activities that overlap continuously rather than following a strictly prescribed sequence.
- Due to cyclic nature of research: It is difficult to determine where to start and when to stop.
- Cyclic mechanism: part of "built-in error correction" machinery.

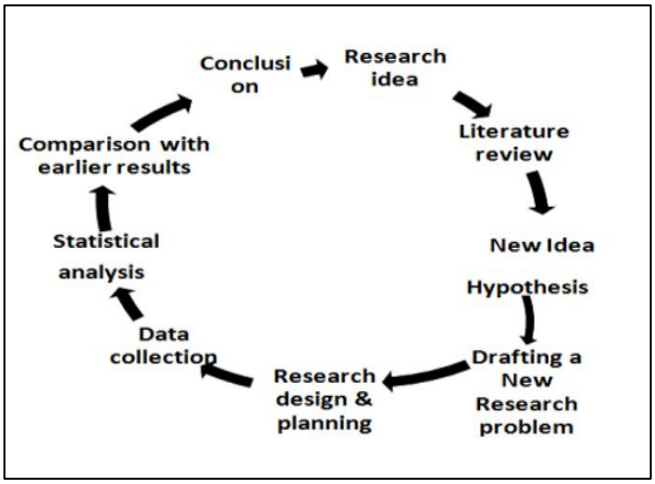

Figure 3.3: The flowchart below well illustrates the research process

Research design addresses the planning of scientific enquiry, designing a strategy for finding out something specific. The design is the complete strategy of tackling the central problem. [7]

3.5 Classification of Research Design:

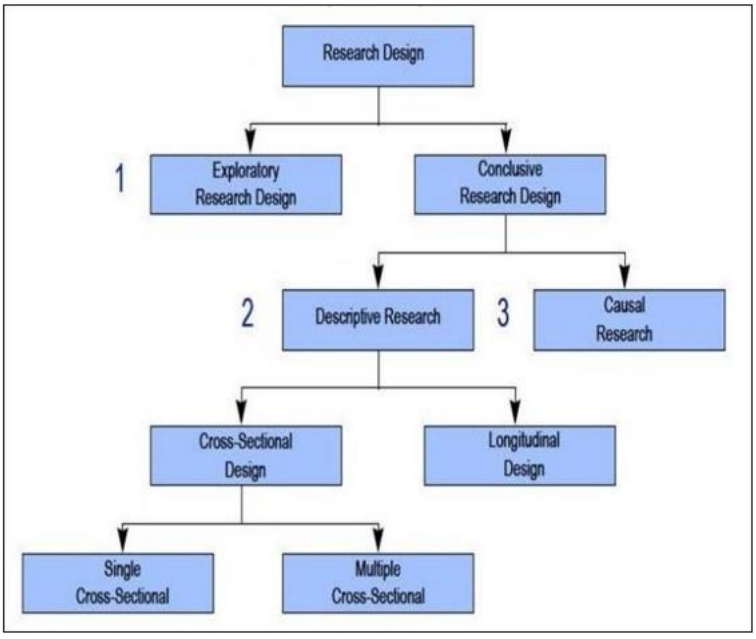

Figure 3.4: Classification of Research Design

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. [8]

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.

Qualitative research is expressed in words. It is used to understand concepts, thoughts or experiences. This type of research enables you to gather in-depth insights on topics that are not well understood.

Common qualitative methods include interviews with open-ended questions, observations described in words, and literature reviews that explore concepts and theories.

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.

Quantitative research is expressed in numbers and graphs. It is used to test or confirm theories and assumptions. This type of research can be used to establish generalizable facts about a topic.

Common quantitative methods include experiments, observations recorded as numbers, and surveys with closed-ended questions.

Table 3.1: Qualitative research vs. Quantitative research [9]

Qualitative research	Quantitative research
Deals with subjective aspects, e.g., experiences, beliefs, perspectives, and concepts.	Measures different types of variables and describes frequencies, averages, correlations, etc.
Deals with non-numerical data, such as words, images, and observations.	Tests hypotheses about relationships between variables. Results are presented numerically and statistically.
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.	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 interpretation and narrative analysis.	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.

3.5 Advantages of Research Design:

Research design is a crucial step in conducting any research project, and it involves planning and organizing the research study to ensure its objectives are achieved efficiently and effectively. Here are some of the key advantages of research design:

Clarity of Research Objectives: A well-designed research project clearly defines the research objectives and the methods that will be used to achieve them. This helps to ensure that the research study is focused and that the results will be meaningful and useful.

Improved Data Quality: A well-designed research project ensures that the data collected is high quality, increasing the results' accuracy and reliability. This is because a good research design ensures that the data collection process is standardized and that the data is collected systematically and consistently.

Efficient Use of Resources: A well-designed research project helps to ensure that resources are used efficiently. This is because the research design ensures that the research study is structured in a way that maximizes the use of resources and minimizes waste.

Increased Validity and Reliability: A well-designed research project ensures valid and reliable results. This is because the research design ensures that the study is structured to reduce bias and other sources of error.

Better Communication: A well-designed research project ensures that the research study results can effectively communicate to various audiences. This is because the research design ensures that the research study is structured in a way that is clear and easy to understand. Ethical Considerations: A well-designed research project ensures that ethical considerations are considered. This is because the research design ensures that the research study is structured in a way that minimizes the risks to participants and ensures that informed consent is obtained. [10]

3.6 Disadvantages of Research Design:

While research design has many advantages, some disadvantages need to be considered. Here are some of the key disadvantages of research design:

Limited Scope: A research design may need to be narrower in scope, which can limit the generalizability of the results. This can be a problem if the research study is intended to be applied to a broader population. [11].

Cost and Time: Research design can be time-consuming and expensive. The cost and time required for research design can be a barrier to conducting research studies, particularly for small organizations or those with limited resources.

Complexity: Research design can be complex, particularly for studies involving multiple variables or statistical analyses. This can make it challenging to design a research study that is both feasible and effective.

Ethical Considerations: While research design can help to ensure that ethical considerations are taken into account, it can also present ethical challenges. For example, some research designs may require participants to provide sensitive information or use placebo treatments.

Potential for Bias: Despite efforts to minimize bias, research design can still be subject to bias. This can be problematic if the bias is not detected or undermines the results' validity and reliability. Limitations of Data Collection: Research design can be limited by data availability. For example, data collection may be limited by the availability of participants or the quality of the available data. [12]

3.7 Conclusion:

It is important for research design to bear in its construction the potential issues that may arise in collecting data, especially through interviews and observations. Researchers need to seek permission to conduct research on-site and convey to gatekeepers or individuals in authority how their research will provide the least disruption.

High-quality research is reasonable: good research should be logical. It involves that research is directed by the natural rules of rational reasoning. The wee accepted logical method of introduction and assumption are huge price in transport out from the investigation.

Instruction is the procedure of calculation as of an element to the entire while reasoning is the procedure of analysis as of several principles to a conclusion.

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ISBN: 978-81-19149-41-4

4. Methodology in a Research Paper: Definition and Example

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Abstract:

The methods section of a research paper provides the information by which a study's validity is judged. Therefore, it requires a clear and precise description of how an experiment was done, and the rationale for why specific experimental procedures were chosen. The methods section should describe what was done to answer the research question, describe how it was done, justify the experimental design, and explain how the results were analyzed. Scientific writing is direct and orderly.

An effective research methodology is grounded in your overall approach – whether qualitative or quantitative – and adequately describes the methods you used. In this paper we will Methodology in a Research Paper: Definition and Example.

Keywords:

Methodology, Research Paper, Definition, Example, Qualitative, Quantitative, Results, Discussion, Conclusion, Thesis, Dissertation, Research Proposal, Data Analysis Process.

4.1 Introduction:

The methodology in a research paper, thesis paper or dissertation is the section in which you describe the actions you took to investigate and research a problem and your rationale for the specific processes and techniques you use within your research to identify, collect and analyze information that helps you understand the problem.

In a scientific paper, the methodology always comes after the introduction and before the results, discussion and conclusion. The same basic structure also applies to a thesis, dissertation, or research proposal. [1]

Depending on the length and type of document, you might also include a literature review or theoretical framework before the methodology. First, we will define and differentiate quantitative and qualitative research.

Then, for each of these types of research, we will look at the kinds of information that a methodology should provide. This handout has annotated examples of both quantitative and qualitative methodologies.

Methodology or Materials and Methods covers explanations of research designs. Basically, techniques for gathering information and other aspects related to experiments must be described in a research paper. For instance, students and scholars document all specialized materials and general procedures. In this case, individuals may use some or all of the methods in further studies or judge the scientific merit of the work. Moreover, scientists should explain how they are going to conduct their experiments. [2]

A. Quantitative and Qualitative Research:

There are two main approaches to methodology; quantitative and qualitative. Quantitative research methodology relies on concrete facts and data-driven research, and qualitative research methodology relies on non-data-driven research, such as surveys and polls, to identify patterns and trends.

Quantitative research involves collecting numerical data and conducting mathematical analyses to observe trends, make predictions, run experiments, and test hypotheses.

Qualitative research involves collecting non-numerical data and identifying patterns in language, theme, and structure, among other features, to understand human experiences. Instruments for qualitative research include questionnaires, interviews, and observations. [3]

B. Purpose of Research Methodology:

The primary purpose of research methodology is to provide a clear outline of how you should conduct your research. This helps you in the following ways.

- Systematically explore the research goal.
- Ensure the accuracy of data collection and analysis.
- Minimize errors and bias.
- Enable replication of the study in the future to validate the findings.
- Draw meaningful and insightful conclusions to make informed decisions. [4]

4.2 Type of Research:

The first part of a methodology section usually describes the type of research you perform and how you develop your research methods. This section also discusses the question or problem you investigate through your research and the type of data you need to perform evaluations and research assessments. Additionally, the methodology often includes the criteria your experimental studies need to meet to produce valid and reliable evidence.

A. Data collection process:

The methodology also includes an explanation of your data collection process. For instance, if you perform experimental tests on samples, conduct surveys or interviews or use existing data to form new studies, this section of your methodology details what you do and how you do it. As the name suggests, data collection methods simply refer to the way in which you go about collecting the data for your study. Some of the most common data collection methods include:

- Interviews (which can be unstructured, semi-structured or structured)
- Focus groups and group interviews
- Surveys (online or physical surveys)
- Observations (watching and recording activities)
- Biophysical measurements (e.g., blood pressure, heart rate, etc.)

- Documents and records (e.g., financial reports, court records, etc.) [5]

B. Data analysis process:

Your data analysis approaches are also important in your methodology. Your data analysis describes the methods you use to organize, categorize and study the information you collect through your research processes. Data analysis methods refer to the methods and techniques that you'll use to make sense of your data. These can be grouped according to whether the research is qualitative (words-based) or quantitative (numbers-based).

Popular data analysis methods in qualitative research include:

- Qualitative content analysis
- Thematic analysis
- Discourse analysis
- Narrative analysis
- Interpretative phenomenological analysis (IPA)
- Visual analysis (of photographs, videos, art, etc.)

C. Resources, materials and tools:

The tools, materials and other resources you need for your research and analysis are also important elements to describe in your methodology. Software programs, mathematical and statistical formulas and other tools that help you perform your research are essential in documenting your methodology.

D. Rationale behind the research:

Since your methodology aims to show readers why your research is valid and relevant, the last part of this section of your research paper needs to focus on your rationale. Details like why your studies are relevant, what industries your studies relate to and how other researchers can replicate your results are essential components of this part of your methodology. [6]

4.3 Research Methodology Section in Research Paper:

Let's see what research methodology steps to take to complete a well-thought-out paragraph:

- Begin by indicating your methodological approach, whether quantitative, qualitative, or mixed methods.
- Explain how your chosen methodology is objective and relevant to your research problem.
- Describe the instruments and tools you use to collect data (surveys, questionnaires for interviews, archival research, or observation), and provide background information if necessary.
- Discuss how you plan to analyze the data using chosen methods (statistical analysis or exploring theoretical perspectives).
- Deliver background information on any particular methods your readers may not be familiar with.
- Describe your sampling process and explain why you chose this method. If you decide to do interviews, explain how you'll conduct them and select participants.
- Acknowledge and address any potential limitations in your research, including practical issues that may impact data collecting, and explain why you apply your methodology despite the potential risks.

Methodology in research refers to the scientific framework adopted in the research process. Data for research in methodology is collected through surveys, interviews, group discussions, and tracking online trends. [7]

A. Inductive vs. Deductive research: Inductive reasoning in methodology is a blank-page approach, where researchers create hypotheses from observed patterns. Deductive reasoning in methodology is concerned with creating hypotheses around existing theories.

A mixed approach combines inductive and deductive research in different parts of the study where either is best suited.

Table 4.1: Examples of each approach [8]:

Type of Research	Example
Inductive	**Observation** – Your Uber ride took longer than the subway.
	Pattern – Your Uber ride has taken longer than the subway for 2 weeks
	Theory – Uber rides take longer than the subway
Deductive	**Theory** – Uber rides take longer than the subway
	Hypothesis – If you took the subway, you would get there faster than an Uber
	Collect data on time taken by both means in one route
Mixed	Begin with the **observation** and work with the **theory** in mind

4.4 Types of Methodologies:

Three research methodology types are distinguished by their focus on numbers, words, or both. Let's clarify their differences and features.

A. Quantitative Research Methodology: T

his approach aims to measure and test numerical data. It is used to confirm something. The method employs various techniques, such as tests, surveys, and existing databases. For instance, the quantitative methodology may be appropriate if you need to test several hypotheses.

B. Qualitative Research Methodology:

It involves the collection and analysis of textual data and words. This approach is commonly used for exploratory research, where the study objective is to understand a phenomenon. It involves various techniques like interviews, observations, and focus groups.

Exploratory research may be particularly useful in Sociology or Psychology, which aims to understand human actions.

C. Mixed Methodology:

This approach combines quantitative and qualitative methodologies. The quantitative method provides definitive facts and figures, while the qualitative approach adds a particular human aspect to the research. Researchers can obtain exact and exploratory data using a mixed-method approach, leading to incredibly interesting outcomes. [9]

4.5 Methodology vs. Methods:

The confusion between "methodology" and "methods" in research is a common occurrence, especially with the terms sometimes being used interchangeably. Methods and methodology in the context of research refer to two related but different things: method is the technique used in gathering evidence; methodology, on the other hand, "is the underlying theory and analysis of how research does or should proceed". Methodology as "a set of principles and ideas that inform the design of a research study." Meanwhile, methods are "practical procedures used to generate and analyze data. To summarize these definitions, methods cover the technical procedures or steps taken to do the research, and methodology provides the underlying reasons why certain methods are used in the process. [10]

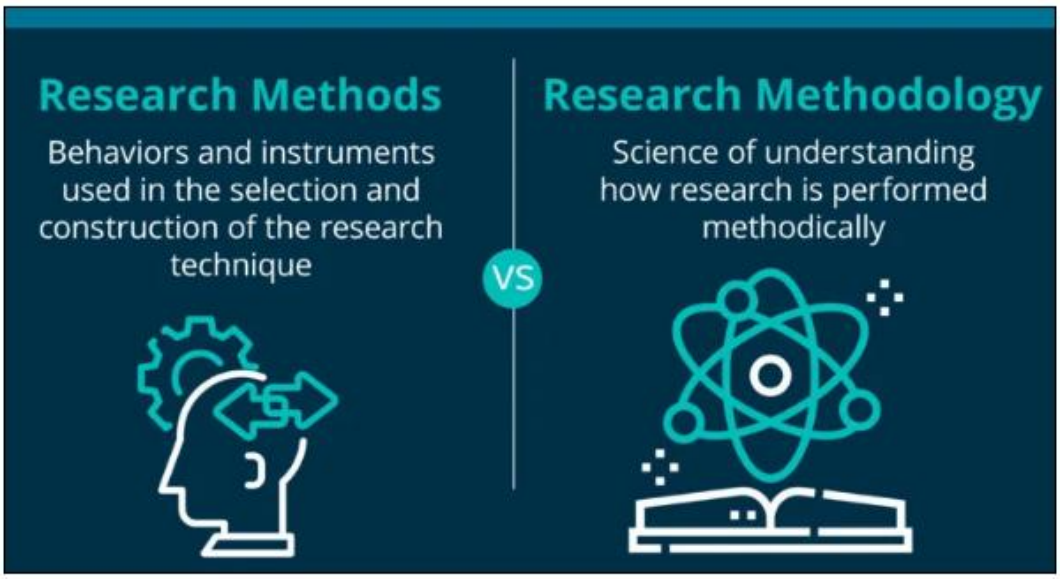

Figure 4.2: Methodology vs. Methods (Source: Surbhi,2016)

4.6 Writing Research Paper Methodology:

The research methodology is an important section of any research paper or thesis, as it describes the methods and procedures that will be used to conduct the research. It should include details about the research design, data collection methods, data analysis techniques, and any ethical considerations.

The methodology should be written in a clear and concise manner, and it should be based on established research practices and standards. It is important to provide enough detail so that the reader can understand how the research was conducted and evaluate the validity of the results.

Th e concept of the research onion model to help researchers develop a methodology and construct research design techniques within the field of future studies. The characteristic of research onion model is illustrated by its six main layers, which serve as a step-by-step guide for researchers on how to write a research methodology. [11]

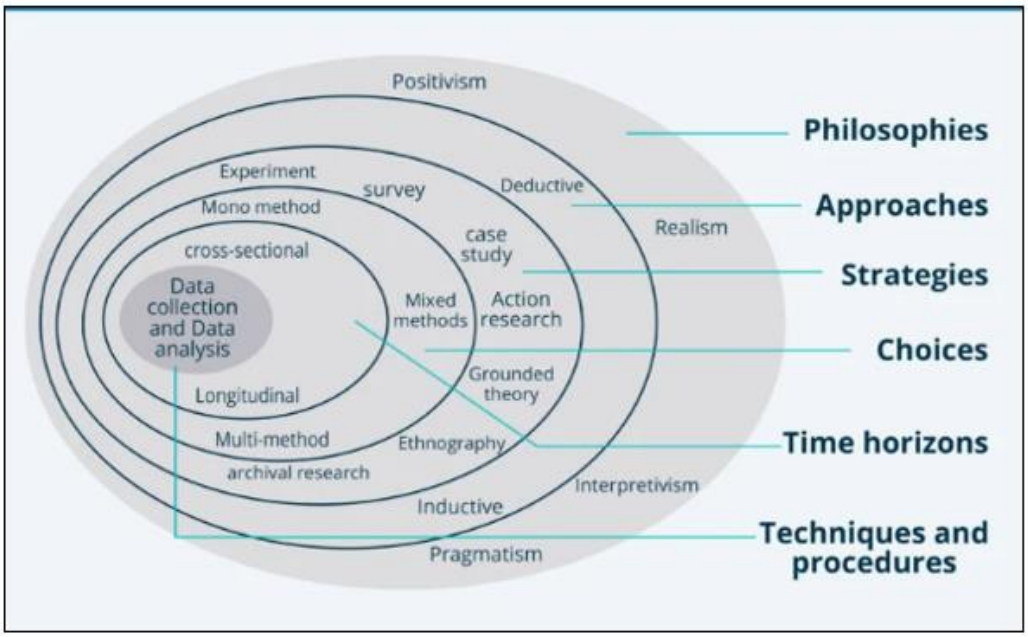

Figure 4.3: The Research Onion Model (Source: Saunders, et.al)

Research Design

A. **Introduce Your Methods:** Introduce the methodological approach used in investigating your research problem. In one of the previous sections, your methodological approach can either be quantitative, qualitative, or mixed methods. Look for a methodology in research example that you can use as a reference.
B. **Establish Methodological Connection:** Explain the relevance of your methodological approach to the overall research design. Keep in mind that the connection between your methods and your research problem should be clear. This means that your methodology of research must be appropriate to achieve your paper's objective—to address the research problem you presented. To wit, if you need help to write your research problem, refer to our article on what is a research question.
C. **Introduce Your Instruments:** Indicate the research instruments you are going to use in collecting your data and explain how you are going to use them. These tools and instruments can be your surveys, questionnaires for interviews, observation, etc. If your methods include archival research or analyzing existing data, provide background information for documents, including who the original researcher is, as well as how the data were originally created and gathered. Keep in mind that aside from your methodology in research paper, the identification of the research instrument is equally significant.
D. **Discuss Your Analysis:** Explain how you are going to analyze the results of your data gathering process. Depending on your methodology, research for ways on how you can best execute your study either by using statistical analysis or exploring theoretical perspectives to support your explanation of observed behaviors.
E. **Provide Background Information:** When using methods that your readers may be unfamiliar with, make sure to provide background information about these methods. It would also help if you can provide your research methodology meaning so you can present a clear and comprehensive research context.
F. **Discuss Sampling Process:** Sampling procedures are vital components of your methodology. Explain the reason behind your sampling procedure. For example, if you are using statistics in your research, indicate why you chose this method as well as your sampling procedure. If you are going to do interviews, describe how are you going to choose the participants and how the interviews will be conducted.

G. Address Research Limitations: Make sure to address possible limitations you may encounter in your research, such as practical limitations that may affect your data gathering process. [12]

4.7 Example of a Methodology in a Research Paper:

Methodology research paper example is a useful tool for writing research because it demonstrates the principles of structuring the research methodology section. Taking into account the irreversible place of the methodology part of the research paper, methodology research paper example must demonstrate how the researcher is going to prove the hypothesis or to decide the problem of the investigation. Thus, the review of the methodology research paper example should occupy the important place during the preparation for the research. In an abstract, you will need to explain your methodology. Some examples of explaining your methodology include the ways you collected and analyzed data (such as through surveys), the type of research you chose, and your rationale behind the methodology. Below are some examples of methodology. As you read through each one, think about what you would have to know about your research plan to describe it similarly.

Example: A mixed-method approach was used to understand how local high school students perceive dress codes. Firstly, a Likert scale survey was disbursed to over 200 students from the Albany school district. The Likert scale is generally considered to be the gold standard of ordinal data collection.

Survey takers were asked to rank their agreement with statements about dress codes on a scale from “strongly disagree” to “strongly agree.” At the end of the survey, participants were asked if they would be interested in discussing their opinions further in an interview. Open-ended interviews were conducted with 50 respondents to contextualize and gain a more in-depth understanding of the survey rankings.

Note how this example makes it clear a) what type of survey was used, b) why the author chose that survey, c) what they hoped to learn from the survey, and d) how they supplemented it with interview questions.)

Research Design

The following example of a methodology in a research paper provides insight into the structure and content to consider when writing your own:

This research article discusses the psychological and emotional impact of a mental health support program for employees. The program provided prolonged and tailored help to job seekers via a job support agency that kept contact with applicants beyond initial job placement to give different forms of assistance. I chose a 50% random selection of respondents who participated in the employment agency's support program between April and October and met the research criteria I created based on prior and comparable studies.

My colleagues and I randomly allocated the 350 resultant patients to the treatment or control groups, which included life skills development and career training in an in-house workshop setting. My colleagues and I assessed the 350 participants upon admission and again after they reached the 90-day employment requirement.

The psychological functioning and self-esteem assessments we conducted revealed considerable evidence of the impact of treatment on both measures, including results that contradicted our original premise.

We discovered that, rather than demonstrating better functioning and higher self-esteem, participants in the therapy group exhibited poorer cognitive and emotional functioning and self-esteem. These findings prompted my study team and me to conclude that people who consider themselves unfulfilled in their jobs often endure a substantial decline in performance as a consequence of increased workplace stress and lower emotional well-being, irrespective of their mental health status.

Sampling:

Analysts in statistical surveying broadly utilize diverse inspecting techniques, so they don’t have to investigate the whole population to gather significant experiences. It is additionally a period advantageous and a practical approach and subsequently shapes the premise of any exploration plan. Inspecting strategies can be utilized in an exploration overview programming for the ideal deduction.

The population for this study will be from different levels of employees at ADNOC Company and Ministry of Education. These two Companies provide two various services, one is oil production and the other is an educational service in UAE. The study will require a sample of 200employees from both Companies in order to participate in this study.

Random sampling will obtain use in selecting 100employees from each of these companies. This study will rely on these two companies so as to ensure that employees from different diversities and with diverse experiences obtain selection for reliability of collected data.

4.8 Problems to Avoid:

A. Irrelevant Detail: The methodology section of your paper should be thorough but to the point. Do not provide any background information that does not directly help the reader understand why a particular method was chosen, how the data was gathered or obtained, and how the data was analyzed in relation to the research problem [note: analyzed, not interpreted! Save how you interpreted the findings for the discussion section]. With this in mind, the page length of your methods section will generally be less than any other section of your paper except the conclusion.

B. Unnecessary Explanation of Basic Procedures: Remember that you are not writing a how-to guide about a particular method. You should make the assumption that readers possess a basic understanding of how to investigate the research problem on their own and, therefore, you do not have to go into great detail about specific methodological procedures. The focus should be on how you applied a method, not on the mechanics of doing a method. An exception to this rule is if you select an unconventional methodological approach; if this is the case, be sure to explain why this approach was chosen and how it enhances the overall process of discovery.

C. Problem Blindness: It is almost a given that you will encounter problems when collecting or generating your data, or, gaps will exist in existing data or archival materials. Do not ignore these problems or pretend they did not occur. Often, documenting how you overcame obstacles can form an interesting part of the methodology. It demonstrates to the reader that you can provide a cogent rationale for the decisions you made to minimize the impact of any problems that arose.

D. Literature Review: Just as the literature review section of your paper provides an overview of sources you have examined while researching a particular topic, the methodology section should cite any sources that informed your choice and application of a particular method [i.e., the choice of a survey should include any citations to the works you used to help construct the survey].

E. It's More than Sources of Information: A description of a research study's method should not be confused with a description of the sources of information. Such a list of sources is useful in and of itself, especially if it is accompanied by an explanation about the selection and use of the sources. The description of the project's methodology complements a list of sources in that it sets forth the organization and interpretation of information emanating from those sources. [13]

4.9 Conclusion:

Research methodology serves as a blueprint to guide researchers in conducting a structured study and gathering accurate and reliable data.

It ensures that you draw meaningful conclusions and make data-driven decisions. the types of Research Methodology, a researcher can systematically design the study to get reliable results.

Also, Research Methodology should justify that the selected type of research methodology is the fittest for the best outcome. A sound research methodology results in scientifically sound effects, but flawed research methodology fails to do so.

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ISBN: 978-81-19149-41-4

5. Research Design Paper Instructions

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Abstract:

A research design can be defined as the preparation of conditions, for the collection and analysis of data in such a manner, which aims at combining relevance to the research purpose with economy in procedure. In other words, the design arrangement of a research project is commonly known as the "research design". The three most important success criteria in publishing are as follows: the paper describes good research, it is written according to the traditions of scientific writing and submitted to the right journal. The "right" journal publishes papers similar to yours. This paper investigates what research design is, the different kinds of research design and how a researcher can choose the appropriate research design for his/her study. It is effectual to follow the usual structure of scientific papers: introduction, methods, results, discussion, and conclusion. Introduction gives the review of the literature studying your problem and leads to the aim and the hypothesis of your research. You may develop your own steps or procedures as you progress in your writing career; these steps are just to help you begin. In this paper we will Research Design Paper Instructions.

Keywords:

Research, Design, Paper, Instructions, Framework, Document, Design Format, Introduction, Discussion, Hypotheses, Methodology, Conclusion, References.

5.1 Introduction:

The introduction of a research design paper is similar to most academic essay introductions. The section should introduce the topic of the paper. The introduction should also state the significance of the research. Your introduction will cover a lot of ground. However, it will only be half of a page to a few pages long.

The length depends on the size of your paper as a whole. In many cases, the introduction will be shorter than all of the other sections of your paper.

Discussion of theories and hypotheses:

This section of the research design paper contains an extensive discussion on the theories and other factors related to the research questions. The researchers should also state their hypotheses in this section. For example, research regarding distance learning will involve factors like teaching methods and computer literacy. The researchers should then discuss these factors and state that they will take them into account during the data collection.

Methodology:

The methodology section will contain the most important content of the paper. Here, the researchers will discuss their overall methodology. The researchers can add more subsections depending on the nature of their study and their chosen methodology.

Conclusion:

The conclusion will simply summarize the document and state additional information that the researchers did not discuss in the previous sections. If an individual is writing the paper for a project proposal, they may not need to include a conclusion.

A research design is the plan, structure, strategy of investigation conceived to answer the research question and test the hypothesis. The dissertation research design can be classified based on the type of data and the type of analysis.

References:

The reference section is where the writer will list all the sources they used for the document. This should include the sources that individuals used in the theoretical discussion section and other discussions. Similar to the conclusion, a research design for a proposal will not require a reference list. Only a standalone research design paper should include a reference list. [3]

Research Design

The function of a research design is to ensure that the evidence obtained enables you to effectively address the research problem logically and as unambiguously as possible. In social sciences research, obtaining information relevant to the research problem generally entails specifying the type of evidence needed to test the underlying assumptions of a theory, to evaluate a program, or to accurately describe and assess meaning related to an observable phenomenon.

- Identify the research problem clearly and justify its selection, particularly in relation to any valid alternative designs that could have been used,
- Review and synthesize previously published literature associated with the research problem,
- Clearly and explicitly specify hypotheses [i.e., research questions] central to the problem,
- Effectively describe the information and/or data which will be necessary for an adequate testing of the hypotheses and explain how such information and/or data will be obtained, and
- Describe the methods of analysis to be applied to the data in determining whether or not the hypotheses are true or false. [4]

This method includes data collection, analysis, and presentation. It lets the researcher clearly present the problem statement in order to allow others to better understand the need for this kind of research. Without a clear problem statement, you're not doing descriptive but exploratory research. The research design is usually incorporated into the introduction of your paper. You can obtain an overall sense of what to do by reviewing studies that have utilized the same research design [e.g., using a case study approach]. This can help you develop an outline to follow for your own paper.

5.2 The Stages for Developing A Good Research Design are Outlined Below:

The first step in your study design is to figure out what you're going to conduct and why you're going to do it. Many individuals get so engrossed in their endeavor that they lose sight of the forest for the trees and believe that everyone understands the significance of their effort.

A. Determine the Key Unknowns:

It would be best if you studied upon prior work after settling on the broad topic of your research subject and developed a solid justification and purpose for doing it. What are the most significant unknowns and research questions, what gaps does my research project have the potential to fill. Write a "Wider Justification" in which you examine prior work while also identifying knowledge gaps.

B. Determine the Most Important Deliverables:

What will your research's primary outcomes and deliverables be. Understanding, quantification, conceptual, process, analysis, characterization, and determination should all be included in the deliverables.

C. Locate Important Resources:

What are the resources you'll need to do this research project. Will you have to conduct fieldwork, and if so, how long will it take. Are there any particular computer resources, packages, applications, remotely sensed pictures, or computer codes that you'll need.

D. Research Time Period:

A realistic evaluation of the time requirements for each goal should be part of your study plan. Make a Gantt Chart outlining each goal and the amount of time you have available (you can do this in Excel or on paper!).

Calculate how much time each goal will take you in detail, and be realistic about whether you can do it in the time you have available.

E. Make A Workflow Diagram:

After you've completed the stages above, you'll be able to bring it all together into a logical workflow model. These, in my opinion, should be included in all dissertations and grant proposals since they clearly show how the various goals relate to one another.

Write the goal at the top of the page, followed by the hypotheses. Below here, list your resources or inputs. Then, in a separate box, write down each goal and the important deliverables that go along with it.

F. Risks and How to Avoid Them:

If you're going to undertake fieldwork, you'll need to do a risk assessment and explicitly define potential dangers, as well as how you'll minimize or avoid them.

However, you should be aware of broader dangers; do you have the necessary knowledge.

Are the materials you need readily available. Will the prices fluctuate. The following are some potential dangers:

- Unreliable exchange rates
- Wildlife dangers
- Weather
- Hazards to the environment and garbage disposal
- Failure of the equipment

G. Start Your Research:

You're ready to start your research now that you've spent some time properly preparing it. You will research a topic that is relevant, interesting, and enjoyable to you.

You've developed a solid study proposal and are certain that your findings will be useful to society and other scientists. [5]

5.3 Data Type You Need for Research:

Decide on the type of data you need for your research. The type of data you need to collect depends on your research questions or research hypothesis. Two types of research data can be used to answer the research questions:

A. Primary Data:

The researcher collects the primary data from first-hand sources with the help of different data collection methods such as interviews, experiments, surveys, etc. Primary research data is considered far more authentic and relevant, but it involves additional cost and time.

B. Secondary Data:

Research on academic references which themselves incorporate primary data will be regarded as secondary data.

There is no need to do a survey or interview with a person directly, and it is time effective. The researcher should focus on the validity and reliability of the source.

Below are the key aspects of the decision-making process:

- Data type required for research
- Research resources
- Participants required for research
- Hypothesis based upon research question(s)
- Data analysis methodologies
- Variables (Independent, dependent, and confounding)
- The location and timescale for conducting the data
- The time period required for research [6]

The research design provides the strategy of investigation for your project. Furthermore, it defines the parameters and criteria to compile the data to evaluate results and conclude.

Research studies are designed in a particular way to increase the chances of collecting the information needed to answer a particular question. The information collected during research is only useful if the research design is sound and follows the research protocol. Carefully following the procedures and techniques outlined in the research protocol will increase the chance that the results of the research will be accurate and meaningful to others. The more often results are reproduced, the more likely it is that researchers and the public

will accept these findings as true. Additionally, the research design must make clear the procedures used to ensure the protection of research subjects, whether human or animal, and to maintain the integrity of the information collected in the study. [7]

To conduct effective research, you must understand the research process steps and follow them. Here are a few steps in the research process to make it easier for you:

- Step 1: Identify the Problem. ...
- Step 2: Evaluate the Literature. ...
- Step 3: Create Hypotheses. ...
- Step 4: The Research Design. ...
- Step 5: Describe Population. ...
- Step 6: Data Collection. ...
- Step 7: Data Analysis. ...
- Step 8: The Report-writing.

Here are some of the elements of a good research design:

- Purpose statement
- Data collection methods
- Techniques of data analysis
- Types of research methodologies
- Challenges of the research
- Prerequisites required for study
- Duration of the research study
- Measurement of analysis

The research design must contain a strategy for interpreting the analyzed data so as to provide adequate findings and conclusions from the research which will allow the researcher make recommendations or implications based on the study. Research design is divided into three groups: quantitative; qualitative and mixed method research design. The researcher has to decide the most appropriate design which befits the type of research work. [8]

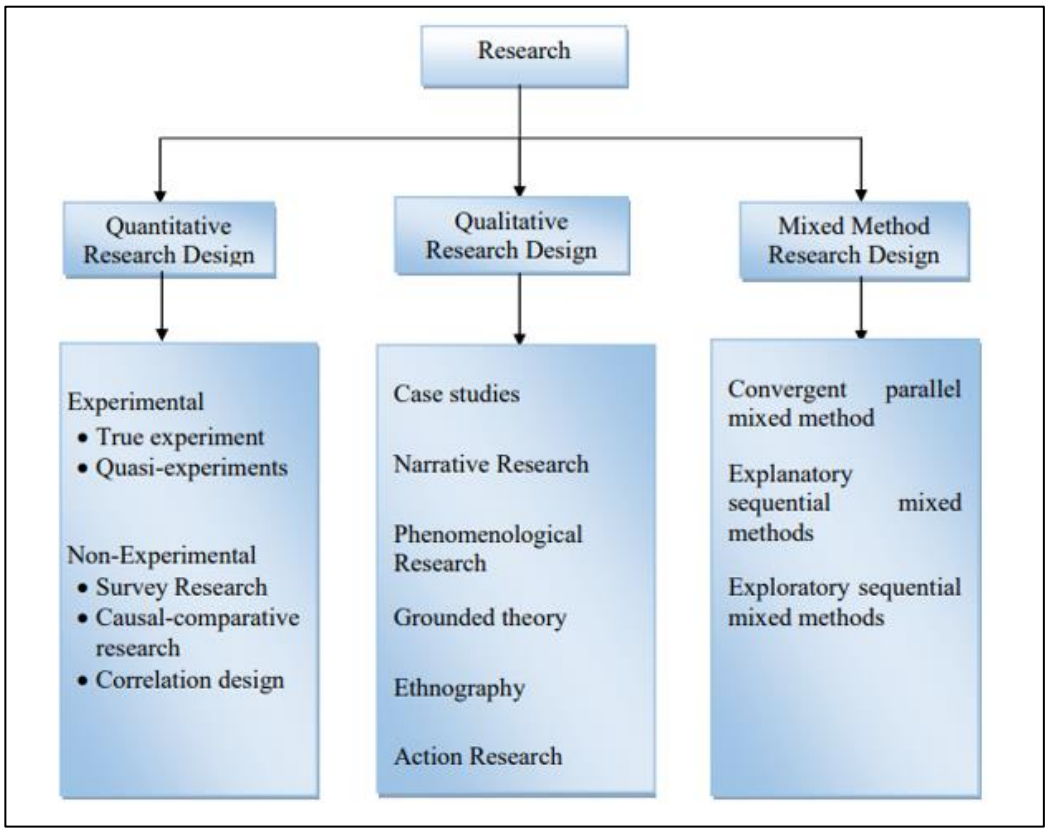

Figure 5.1: Summarized form of research design types

5.4 Different Types of Research Design:

A researcher must be well-versed in different types of research design. Moreover, a clear understanding of different research designs helps choose the proper technique for the research. Research design is broadly divided into quantitative and qualitative research design. We'll walk you through them in detail below.

5.4.1 Quantitative Research Design:

Quantitative research design aims at finding answers to who, what, where, how, and when through the course of research. Moreover, the outcome of the quantitative analysis is easy to represent in the form of statistics, graphs, charts, and numbers. quantitative research design types include descriptive, correlative, quasi-experimental, and experimental types.

- Descriptive. Researchers can use the descriptive design to describe characteristics, trends, means, and other measurable quantities. Studies that aim to quantify a similar factor among a specific demographic will benefit from the descriptive type.
- Correlative. A correlative design aims to assess a quantifiable relationship between different variables. The correlative type is perfect for studies that focus on comparing two or more samples.
- Quasi-experimental. Researchers use a quasi-experimental design to quantify a cause-and-effect relationship between different samples. Studies that focus on a single group will benefit from this type.
- Experimental. The experimental design also aims to quantify a cause-and-effect relationship. However, it involves having an experimental group and a controlled group. This design type is good for any study that aims to assess a causal relationship. [9]

The experimental research is affected by several limitations Human Society reveals inequalities in many choose and find out homogeneous groups for experiments. The purpose of experimental research is to test the hypothesis of a causal relationship between variables. For an experimental study/research, two groups are required, and compared in terms of the assured effect of the experimental variable the validity of an experiment depends on the equivalence between control group & the experimental group chosen.

Table 5.1: Common Application of Research Design [10]

Design	Best for	Also used for
Survey		
1. Cross-Section 2. Longitudinal	Description Description Explanation	Explanation Exploration
Literature Reviews	Exploration	Description & Explanation
Unobtrusive Method		
1. Cross-Section 2. Longitudinal	Description Description Explanation	Explanation Exploration Exploration
Experiment	Experimentation	
Field Search	Exploration	Description Explanation

5.4.2 Qualitative Research Design:

Qualitative research design focuses on finding answers to how and why. It uses open-ended questions and helps the subjects express their views clearly.

Qualitative research is ideal for businesses that aim to understand customers' behavior and requirements.

Qualitative research design types include ethnographic, narrative, grounded theory, case study, phenomenology, and hermeneutics.

- Ethnographic. In ethnography, the researcher directly interacts with the respondents in their natural environment or community. The researcher will take note of their observations and first-hand experiences.
- Narrative. In a narrative design, the researcher writes a narrative about the respondent's life experiences. Researchers use this type if they are studying the life and behavior of a specific individual.
- Grounded Theory. The grounded theory design aims to establish or modify a theory. The method requires the researcher to analyze qualitative data and develop a new perspective regarding the topic.
- Phenomenology. In phenomenology, the researcher aims to understand an event or phenomenon through the experiences of an individual. Researchers often use this method when studying unusual behavior or events.
- Hermeneutics. The hermeneutics design focuses on interpreting the meaning behind words, art, culture, events, and ideas. Researchers studying subjective topics should use the hermeneutic approach in their study.

I have put together a list of 10 steps for you to think about when designing a research project.

Follow these steps for good research design, and for writing a good grant application or introduction to your dissertation or thesis. [11]

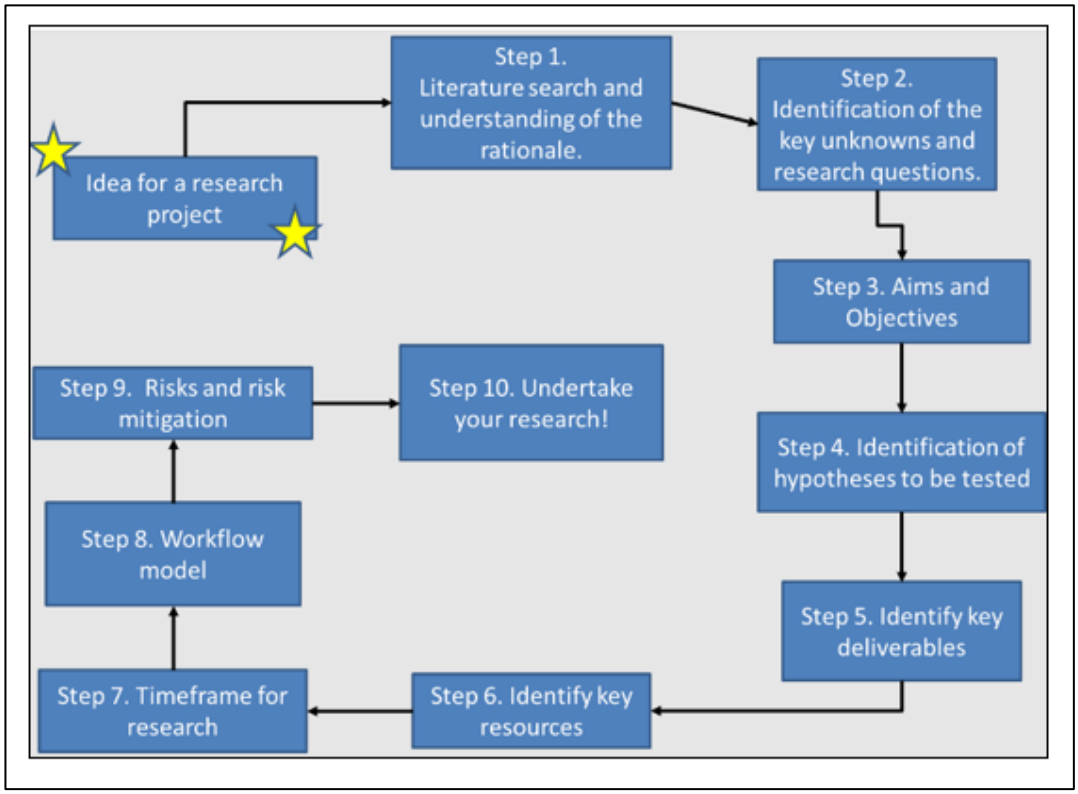

Figure 5.2: Steps for Good Research Design

5.5 Need for Research Design Paper:

Research design is necessary because it makes possible the smooth sailing of the various research procedures, thereby creation research as professional as possible, yielding maximum information with a minimum expenditure of effort, time and money.

For better, economical and attractive construction of a house, we need a blueprint (or what is a community called the map of the house) prepared by an expert architect, similarly we need a research design or a plan in advance of data collection and analysis for four research projects.

Research design stands for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in the analysis, keeping in view the objective of the research and the audibility of staff, time and money.13

Designing the research project may result in rending the research exercise unsuccessful. It is, therefore, imperative that an efficient and appropriate design must be prepared before starting research processes. The research design helps the investigator to organize his ideas in a shape whereby it will be possible for him to look for errors and shortages. [12]

5.6 Nature of Good Research Design Paper:

A good research design is regularly characterized by adjectives like flexible, appropriate, efficient, and economical and so on. Generally, the design which minimizes bias and collected & analyses is considered a good design. The design which gives the smallest experimental error in supposed to be the best design in many investigations similarly; a design which yields maximal information many different aspects of a problem is considered most appropriate and efficient design in respect of many research problems. Some of the strategies of good research design are as follows:

- **Theory** - Grounded Good research reflects the theories which are being investigated where specific theoretical expectations can be hypothesized these are incorporated into the design.
- **Situational** - Good research designs make known the settings for the study, this was shown above where a specific need of teacher and administrators was openly addressed in the design plan.
- Similarly, demoralization, intergroup competition and competition might be accessed throughout the use of the additional comparison group who are not in direct contact with the original group.
- **Feasible** - Good design can be implemented. The series and timing of events are cautiously throughout. Possible problems in measurement, devotion to project database construction and the like, are predictable.
- **Redundant** - Good research designs have some flexibility built into them often this flexibility results from the repetition of essential design features. Research in Social Science: Interdisciplinary Perspectives
- **Efficient** - Good research design strikes a balance between redundancy and the tendency to over design. Where it is responsible, other, less costly, strategies for ruling out potential threat's validity cure utilized. [13]

5.7 Conclusion:

The research process involves several steps that make it easy to complete the research successfully. The steps in the research process described above depend on each other, and the order must be kept. So, if we want to do a research project, we should follow the research process steps. he studies will assess the reason behind the dropouts which may include financial constraints, computer illiteracy, motivation, and parental influence. research design should contain detailed information about Research topic, Objectives, Concepts and their operational definition, Variables, Hypothesis, Method of data collection & method of the data process, Analysis and interpretation, Time dimension of study and approximate expenditure involve.

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ISBN: 978-81-19149-41-4

6. Basic Concepts in Research Design

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Abstract:

Science, social science, and many other fields all use study design as a key component of their studies. However, because there is a lack of clarity in the literature regarding the approaches to research design, research methods, and research methodology in the social sciences, new public administration (PA) researchers and students may view the existence of multiple approaches as a source of confusion.

This three-part review series aims to guide readers through the tangle of periodontal research by clarifying and simplfying numerous problems with the conception, execution, and interpretation of various study designs frequently employed in the discipline.

This knowledge will make it easier for researchers to develop studies that more effectively transfer sound scientific phenomena into conclusions that have therapeutic significance. We shall talk about Fundamental Ideas in Research Design in this essay.

Keywords:

Research Design, Social Science, Development, Research Methods, Researcher, Semi-Experimental, Review, Experimental Design, Research Protocol, Study, Technique.

6.1 Introduction:

The main objective is for students to comprehend fundamental research ideas and recognize the significance of carrying out research in accordance with a predetermined plan. We expect that having a better understanding of research concepts and ethical procedures will improve the research's integrity and the significance of its findings. [1]

The program provides an introduction to the fundamental ideas of research and can be completed at one's own pace (for example). The information lays the groundwork for ethical and proper research conduct.

The subjects covered include how to plan and carry out research as well as how activities taken while conducting research can impact the project's integrity. In this training, ethical research topics are discussed, and it is urged that new research team members make decisions in line with responsible and ethical research methods. [2]

A research problem is presented in its entirety in the research design. It refers to the general approach you use to logically and cogently combine the various study components. It serves as a framework or guide for carrying out the research. It is, in essence, your overall plan for conducting your research.

A study's design identifies the study's type (descriptive, correlational, semi-experimental, experimental, review, and meta-analytic) and sub-type (for example, descriptive - longitudinal case study), research question, hypotheses, independent and dependent variables, experimental design, and, if necessary, data collection techniques and a strategy for statistical analysis.

A research design will typically outline how data will be gathered, the instruments to be used, how they will be used, and how the data will be analyzed. [3]

In order to improve the possibilities of gathering the data required to address a specific subject, research studies are specifically planned. Only when the research design is sound and the research protocol is followed is the data gathered during the study useful.

Research Design

The likelihood that the research findings will be precise and useful to others will rise if the processes and techniques indicated in the research protocol are carefully followed. Because the results can then be replicated by other researchers, following the research protocol and hence the study's design is also crucial.

The likelihood that researchers and the general public would accept these discoveries as true increases with the frequency with which outcomes are replicated. The techniques utilized to guarantee the protection of research subjects, whether human or animal, and to maintain the integrity of the data gathered in the study must also be made apparent in the research design. [4]

Research in common parlance refers to a search for knowledge. Once can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation.

The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge." Redman and Mory define research as a "systematized effort to gain new knowledge."

Some people consider research as a movement, a movement from the known to the unknown. Research in common parlance refers to a search for knowledge. Once can also define research as a scientific and systematic search for pertinent information on a specific topic.

In fact, research is an art of scientific investigation. The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge."

Redman and Mory define research as a "systematized effort to gain new knowledge." Some people consider research as a movement, a movement from the known to the unknown. A research design is a plan for a scientific investigation. It contains the methods, equipment, and procedures used to conduct the research.

It aids in locating and solving potential issues that may come up while conducting research and analysis. The research procedures and approaches are often selected at the beginning of the study.

A research design is a document that describes a project's technique, methodologies, and other crucial information.

According to experts, the research design serves as the project's binding agent. It (research design) helps provide a structure and direction to the research, yielding favorable results. [5]

6.2 Main Elements of a Research Design:

Each element is important for a research design. If you keep these points in mind, you will conduct perfect research. Some of the main elements of research design are:

a. Purpose statement: This is a clear and concise statement of what you want to achieve with your research.

b. Data collection techniques: Many different data collection techniques are available, such as surveys, interviews, and experiments.

c. Data analysis methods: Different data analysis methods are available, such as statistical analysis and qualitative analysis.

d. Research Methodology: Many different research methodologies are available, such as quantitative research, qualitative research, and mixed methods research.

e. Possible objections to research: These are the potential problems or challenges that you may face in your research.

f. Research setting: This is the environment in which you will conduct your research. The research setting can have an impact on the research design.

g. Timeline: It is important to create a realistic timeline that allows you to collect and analyse data from time to time.

h. Measurement of analysis: It is important to choose a measure that is appropriate for the research questions that you are asking and then come to an analysis.

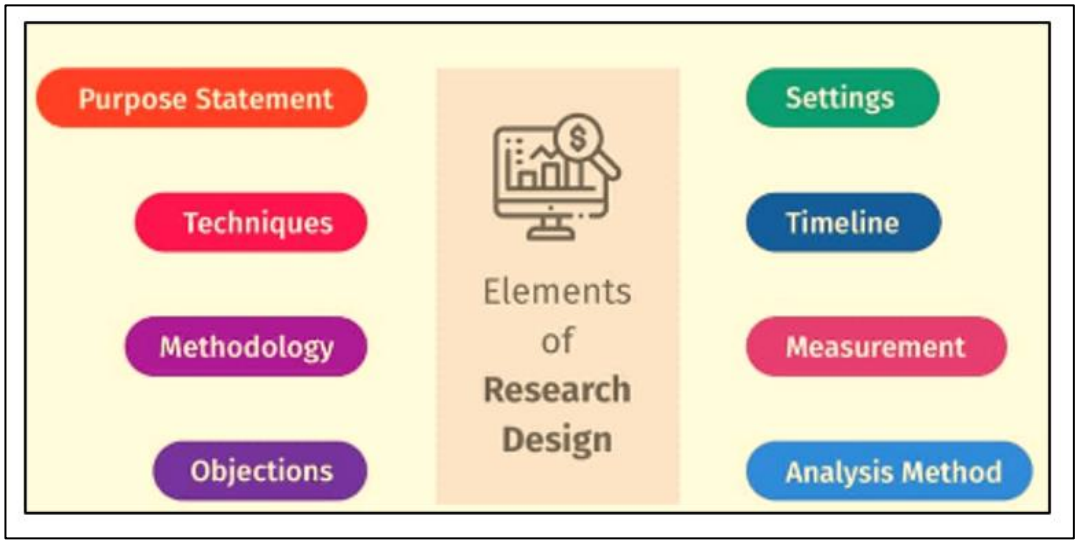


Figure 6.1: Elements of Research Design

6.3 Significance of Features and Concepts in Research Design:

When creating top-notch research projects, it's important to consider the characteristics and principles of research design. Researchers can create a well-designed research project that produces accurate and trustworthy results by assuring clarity and specificity, flexibility,

feasibility, and ethical considerations.

Additionally, researchers can make sure that the research is carried out in a rigorous and systematic manner and that the data collected is accurate and reliable by understanding the key concepts related to research design, such as research methodology, data collection methods, data analysis techniques, sampling, and validity and reliability. [7]

6.4 The Process of Research Design:

The method of doing research is known as the research design process. To guarantee that the study is legitimate, trustworthy, and yields valuable data, the procedure is crucial.

Consider your aims and approaches: Establish the study's goals and research questions, as well as the theoretical underpinnings and methods.

Choose a type of Research Design: Based on the research questions and objectives, choose the best research design, such as experimental, correlational, survey, case study, or ethnographic.

Identify your population and sampling method: Select the sampling technique, such as random, stratified random sampling, or convenience sampling, after determining the target population and sample size.

Pick your data collection techniques: Choose the best instruments or tools for data collection and decide on the methodologies, such as surveys, interviews, observations, or experiments.

Plan your data collection procedures: Create a plan for data collecting that specifies the duration, location, and personnel needed while also taking ethical considerations into account. [8]

6.5 Importance of Research Design:

The significance of research design is found in the fact that it specifies what must be done and how it must be done in order to accomplish the study objectives. It provides the bare minimum of data needed to plan the study project. It expresses the outcomes and analytical input required to transform data into research findings for the research exercise.

The activities that would need to be carried out in order to accomplish the research objective are clearly identified by the research design. It gives the researcher a frame of reference and keeps the investigation from straying. The study design aids in giving the computation and interpretation process direction so that a solution and recommendations can be reached. [9]

6.6 Benefits of Research Design:

The advantages of having a well-thought-out research plan are numerous. Including:

A. Clarity of research objectives: The research design helps to comprehend the goals and outcomes of the study.

Increased validity and reliability: Research design helps to reduce the danger of bias and helps to regulate auxiliary variables in order to assure the validity and reliability of results.

Improved data collection: Data collection is improved because of research design, which helps to guarantee that the right data is gathered and that it is gathered systematically and consistently.

Better data analysis: The proper analysis of the data acquired, leading to insightful findings, is made possible by excellent research design.

B. Improved communication: A well-designed research helps ensure that the findings are accurate and influential among the research team and external stakeholders, which improves communication.

C. Effective use of resources: Research design helps to ensure that resources are used effectively by minimizing the risk of waste and maximizing the effectiveness of the research. [10]

6.7 Research Design in Qualitative Research:

In its simplest form, qualitative research design refers to how you, as a researcher, describe, organize, and carry out your study. The general strategy used by a researcher (or research team) to link theory and concepts with the formulation of research questions and the design of data collecting and analysis techniques for a particular study is known as research design.

The theories, concepts, objectives, settings, beliefs, and networks of interactions that influence a particular issue are integrated into a research design.

Additionally, it is changed by how participants' experiences, views, and research contexts are addressed. A strong qualitative research design clearly explains framing theory and essential dimensions, and methodologies are developed from theory in a way that takes into account past knowledge. This theoretical analysis of the study's fundamental ideas and structures prepares the ground for a meticulous, orderly procedure of data collection and analysis.

Figure 6.2: Process of Research Design

Your research topic serves as the foundation for the qualitative research design process. This may occasionally be determined by a situation, population, or phenomenon that you are interested in researching.

After choosing your area of study, you investigate the fields, ideas, settings, and concepts that will help you understand both what you want to learn more about and what is already known about it.

All facets of research design revolve around the guiding research questions, which are developed through organized procedures of learning, reflecting, and dialoguing with a variety of thinking partners.

Since the entire research design process is inductive, real-time learning can be reflected in the way data collecting and analysis procedures change over time. Modifications to data collection techniques may be made as part of this.

It can also imply that data analysis is used as a generative design tool that starts with formative analysis early on and informs subsequent data gathering and continues throughout a study, rather than just being summative or occurring at the end of data collection (as is typically the case).

A. Types of quantitative research designs: Quantitative designs can be split into four main types. Experimental and quasi-experimental designs allow you to test cause-and-effect relationships

Table 6.1: Descriptive and correlational designs allow you to measure variables and describe relationships between them.

Type of design	Purpose and characteristics
Experimental	• Used to test causal relationships • Involves manipulating an independent variable and measuring its effect on a dependent variable • Subjects are randomly assigned to groups • Usually conducted in a controlled environment (e.g., a lab)
Quasi-experimental	• Used to test causal relationships • Similar to experimental design, but without random assignment • Often involves comparing the outcomes of pre-existing groups • Often conducted in a natural environment (higher ecological validity)
Correlational	• Used to test whether (and how strongly) variables are related • Variables are measured without influencing them
Descriptive	• Used to describe characteristics, averages, trends, etc • Variables are measured without influencing them

B. Create a Research Design: The research design has the following components:

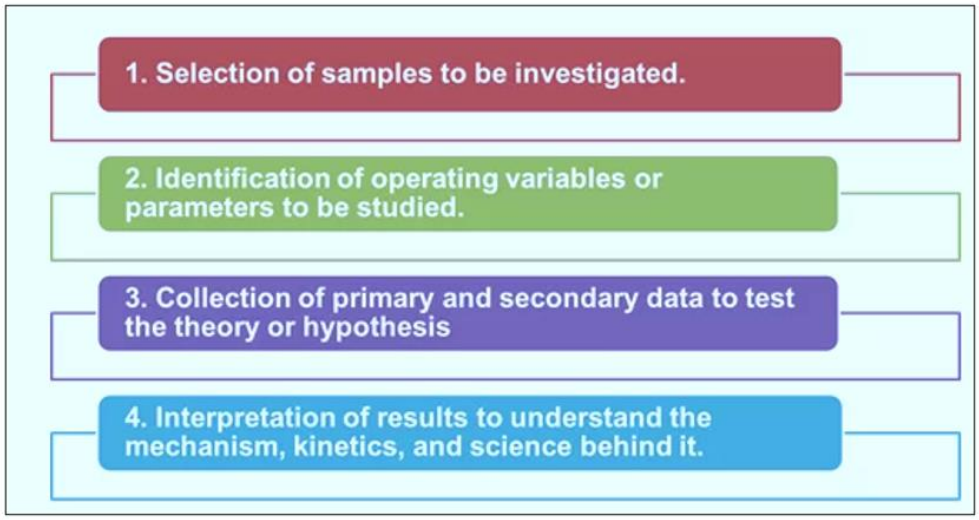


Figure 6.3: Research Design Components

- A researcher begins the study by framing the problem statement of the research work.
- Then, the researcher has to identify the sampling points, the number of samples, the sample size, and the location.
- The next step is to identify the operating variables or parameters of the study and detail how the variables are to be measured.
- The final step is the collection, interpretation, and dissemination of results.

C. Types of Research Design:

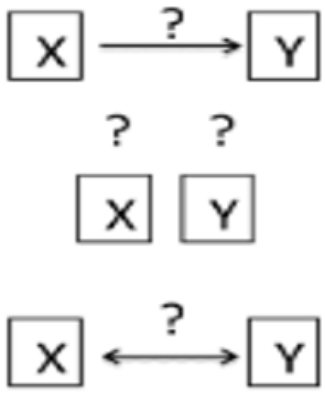
There are four main types of research designs: experimental, observational, quasi-experimental, and descriptive.

a. Experimental Design: Using experimental designs, causal linkages are tested. A researcher will modify one or more independent variables in an experiment and track the impact on a dependent variable.

b. Observational Design: Observational designs are used to study behavior without manipulating any variables. The researcher simply observes and records the behavior.

c. **Quasi-Experimental:** When the independent variable cannot be altered, quasi-experimental approaches are used. In addition to controlling for other variables, the researcher employs a naturally occurring independent variable.
d. **Descriptive Designs:** Designs that describe behavior or phenomena are known as descriptive designs. The researcher only watches the behavior and records it without changing any variables.

A study can be created in a variety of methods to test a theory. The sort of hypothesis (e.g., Does X cause Y?, How can I describe X and Y?, What is the link between X and Y?), the time and financial commitment required for the study, and the likelihood of recruiting participants all influence the research design that is adopted. Each of these factors was taken into account by the principal investigator (PI) when developing the study plan and research methodology.



There are many kinds of research, however, most of them fall into two categories: descriptive and experimental. [11]

6.8 Conclusion:

In conclusion, creating high-quality research projects requires careful consideration of study design. Questioner offers a flexible platform for planning and carrying out research projects thanks to its user-friendly interface, powerful data gathering and analysis capabilities, and

the capacity to incorporate results from many sources. You have all you need to get research findings from our comprehensive spectrum of research tools. A well-crafted research proposal always starts with a thorough comprehension of all the relevant data, identifying the objectives, creating a sound research question, and designing an acceptable study design for efficient study implementation. The hierarchy of evidence, the formulation of a research question and hypothesis, as well as the many research designs used, have all been introduced in this article. In order to ensure that the research is carried out in a rigorous and systematic manner and produces valid and reliable results, it is important to consider the features and concepts of research design, such as clarity and specificity, flexibility, feasibility, and ethical considerations, as well as research methodology, data collection methods, data analysis techniques, sampling, and validity and reliability.

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ISBN: 978-81-19149-41-4