UNIT 4: FORMULATING THE RESEARCH DESIGN

Learning outcomes

- Understand the importance of thinking carefully about your research design
- Identify the main research strategies and why these should not be thought of us mutually exclusive
- Explain the difference between qualitative and qualitative data collection techniques and analysis procedures
- Explain the reason for adopting multiple methods techniques when conducting research
- Consider the implications of adopting different time horizons for your research
- Explain the concepts of validity and reliability

4.1 Meaning and definition of Research design

After defining a particular research area or problem and reviewing the related literature about your topic, the next step is to construct the research design. The research design focuses on turning a research question and objectives into a research project. It considers research strategies, choices and time horizons. Hence, it is fundamental to the success of any scientific research. Research design means an overall framework or plan for the activities you will undertake during your research study. It involves decisions concerning a research study about what, where, when, how much and by what means. It constitutes a blueprint for the collection, measurement and analysis of data. It serves as a framework for the study, guides your data collection and analysis, the research instrument you will use and the sampling plan you will follow.

According to Kerlinger (1986), *"Research design is the plan, structure and strategy of investigation conceived to obtain answers to research questions and control variance."*

According to Kinner and Taylor in Bastin (2018): *"A research design is the basic plan which guides the data collection and analysis phase of the research project. The framework specifies the type of information to be collected, the source of data and the data collection procedure."*

4.2 Elements of research design

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i. ***Problem:*** an interrogative sentence or statement that asks what relation exists between two or more variables. The research design is based on the research problem.

ii. ***Methodology:*** deals with a choice of research design methods of data collection, measurement and types of analysis. All of these must be congruent. They must fit together. The methodology should be appropriate to the research problem.

iii. ***Report writing:*** It involves the preparation and presentation of the research report. A report is a presentation of the research findings directed to a specific audience to accomplish a specific objective.

4.3 Types of research design strategies

4.3.1 Descriptive research design

A descriptive research design is designed to describe something. It accurately profiles organizations, events, situations, or phenomena. It describes existing conditions or relationships, held opinions, ongoing processes, evident effects or ongoing/developing trends. It is a fact-finding operation designed to search for information. Investigators collect, classify and correlate data to describe what exists. But it does not answer why phenomena behave as they do. Descriptive research is appropriate under the following conditions: when you are

- Portraying the characteristics of social or any phenomena and determining the frequency of occurrence.
- Determining the degree to which variables are associated.

Purposes of descriptive research

- To collect detailed factual information that describes existing phenomena.
- To identify problems or justify current conditions and practice.
- To make comparisons and evaluations.
- To determine what others are doing with similar problems or situations and benefit from their experience in making future plans and decisions.

4.3.2 Exploratory research design:

Exploratory research designs explore ideas and insights to obtain a proper definition of the problems at hand. It is appropriate for the early stage of the decision-making process. It is designed to preliminary investigate a situation with a minimum time and cost expenditure.

Purpose of exploratory research

- To identify problems and opportunities.
- To develop a more precise formulation of a vaguely identified problem or opportunity.
- To gain perspective regarding the breadth of variables operating in a particular context.
- To establish priorities regarding the potential significance of various problems or opportunities.
- To identify and formulate alternative courses of action.
- To gather information on the problems associated with doing conclusive research.
- To gain management and researcher's perspective regarding the character of the problem situation.

4.3.3 Experimental research design:

Experimental research aims to investigate possible cause-and-effect relationships and understand the nature of the functional relationship between causal factors and the effect you are to predict. The focus is on the variable relationship. It describes what will be when certain variables are carefully controlled or manipulated. An experimental design involves the specifications of:

- treatments that you are to run;
- test units you are to use;
- the dependent variables you are measuring; and
- procedures for dealing with extraneous variables.

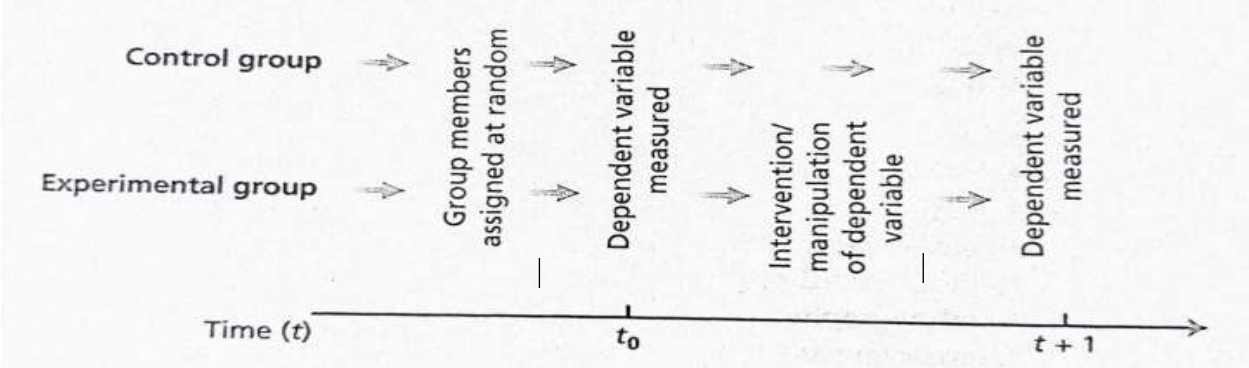

Figure 4.1: A classic experiment strategy *Source: Saunders et al., 2009*

4.3.4 Survey

It is usually associated with the deductive approach and frequently used to answer who, what, where, how much and how many questions. Researchers generally use surveys in exploratory and descriptive research.

- Surveys are popular as they allow the collection of a large amount of data from a sizable population in a highly economical way.
- The data is often collected using a questionnaire administered to a sample. These data are standardized, allowing easy comparison. Structured observation and structured interviews are also often used in the survey strategy.
- When sampling is used, it is possible to generalize findings representative of the whole population at a lower cost than collecting the data for the entire population.
- The survey strategy is perceived as authoritative by people in general and is comparatively easy to explain and understand.
- Allows you to collect quantitative data which you can analyze quantitatively using descriptive and inferential statistics
- The data collected can be used to suggest possible reasons for particular relationships between variables and to produce models of these relationships.

4.3.5 Case study

A case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence (Robson, 2002). The research is undertaken in a highly uncontrolled context. Has the considerable ability to generate answers to questions about why, what, and how. We use case studies in explanatory and exploratory research. If you are using a case study, you will likely need to use and triangulate multiple data sources. *Triangulation* refers to using different data collection techniques within one study to ensure that the data are telling you what you think they are telling you.

4.4 Multiple methods choices –combining data collection techniques and analysis procedures

In choosing your research methods, you will either use a single data collection technique and corresponding analysis procedures **(mono method)** or use more than one data collection technique and analysis procedures to answer your research question **(multiple methods),** where a single research study may use quantitative and qualitative techniques and procedures in combination as well as primary and secondary data.

The term multi-method refers to where the researcher uses more than one data collection technique with associated analysis techniques but restricts it to either quantitative or qualitative methods (Tashakkori and Teddlie, 2003). For instance, you may collect qualitative data using questionnaires and structured observation, analysing the data using statistical (quantitative procedures), **a multi-method quantitative study**. On the other hand, it could be a **multi-method qualitative study**, e.g. using in-depth interviews and diary accounts and analysing these data using non-numerical (qualitative) procedures.

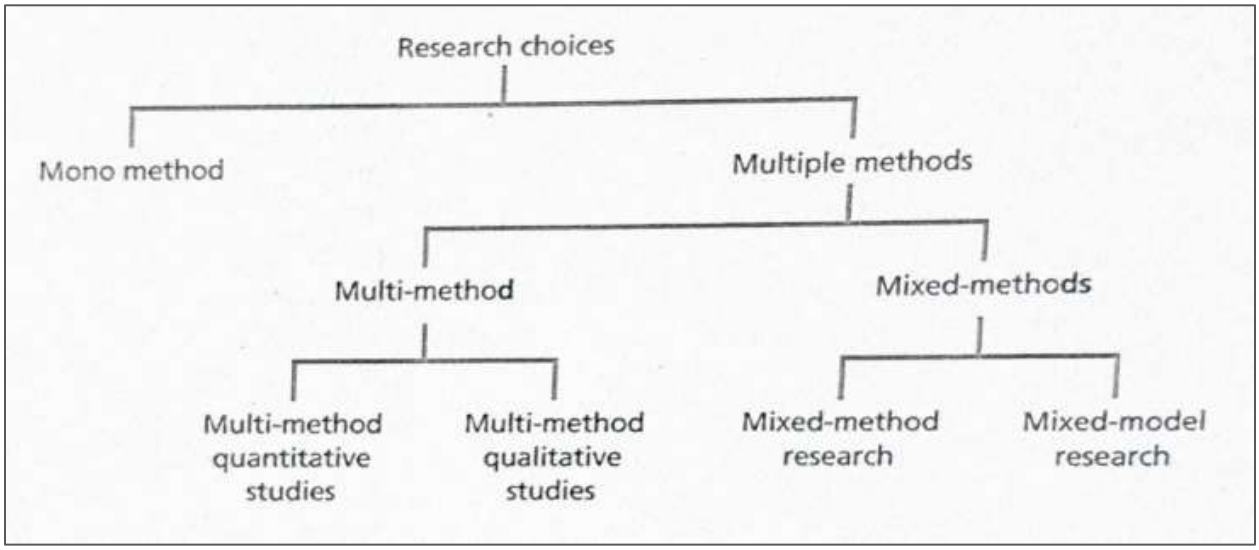

Figure 4.2 Research choices

The mixed methods approach is the general term for simultaneously using quantitative and qualitative data collection techniques and analysis procedures in a research design. The mixed methods approach is subdivided into two types. (i) Where the researcher uses quantitative and qualitative data collection techniques and analysis procedures simultaneously (parallel) or one after the other (sequential) but does not combine them. In other words, you analyse quantitative data quantitatively and qualitative data qualitatively. In addition, often, either quantitative or qualitative techniques or procedures predominate.

In contrast, **mixed–model research** combines quantitative and qualitative data collection techniques and analysis procedures and combines quantitative and qualitative approaches at other phases of the research, such as research question generation. This means that you may convert quantitative data into a narrative that you analyse qualitatively. Alternatively, you may convert qualitative data into numerical codes and analyse them statistically.

Table 4.1: Reasons for using mixed method designs

Reason	Explanation
Triangulation	Use of two or more independent sources of data or data collection methods to corroborate research findings within a study.
Facilitation	Use of one data collection method or research strategy to aid research using another data collection method or research strategy within a study (e.g. qualitative/quantitative providing hypotheses, aiding measurement, quantitative/qualitative participant or case selection)
Complementarity	Use of two or more research strategies in order that different aspects of an investigation can be dovetailed (e.g. qualitative plus quantitative questionnaire to fill in gaps quantitative plus qualitative questionnaire for issues, interview for meaning)
Generality	Use of independent source of data to contextualise main study or use quantitative analysis to provide sense of relative importance (e.g. qualitative plus quantitative to set case in broader context; qualitative × quantitative analysis is to provide sense of relative importance)
Aid interpretation	Use of qualitative data to help explain relationships between quantitative variables (e.g quantitative/qualitative)
Study different aspects	Quantitative to look at macro aspects and qualitative to look at micro aspects
Solving a puzzle	Use of an alternative data collection method when the initial method reveals unexplainable results or insufficient data

Source: developed from Bryman (2006)

4.5 Time horizons

Research projects may be cross–sectional or longitudinal.

- Cross-sectional research /snapshot studies study a particular phenomenon at a specific time.

- Longitudinal research has the strength to study change and development. The fundamental question in longitudinal studies is, 'Has there been any change over some time?'(Bouma & Atkinson, 1995).

4.6 The credibility of research findings

It would help if you ensured that your results are valid and reliable. Validity is concerned with the measurement of the quality of data. It ensures measuring what you are expected to measure. It is the characteristics used to describe a test which measures what it claims to measure. According to Kerlinger (1986), *"The commonest definition of validity is epitomized by the question: Are we measuring what we think we are measuring."*

Generalisability *or* ***external validity*** is a concern you may have in the design of your research is the extent to which your research results are **generalizable**. That is, whether your findings apply to other research settings.

Basis of Validation

1. **Logical validation refers** to theoretical, intuitive, or common sense analysis. It is a component of the content of validation. The researcher carefully defines the continuum of a scale and the selected items to be measured.

2. **Jury opinion:** It refers to the personal judgment of experts in the field. Behaviour scientists often measure content validity by such jury opinions. That is, several content experts may judge whether the items or instruments used by the researcher instrument represent the field being investigated. The result of this procedure reflects the 'conformed' judgments of experts in the content field.

3. **Known groups:** Closely related to the jury opinion approach for assessing content validation is a method involving known groups. With this approach, validation comes from the general attitudes and other characteristics of anti-ethical groups and not from specific expertise.

4. **Independent criteria:** One of the validity measurements includes considering the independent measure. For instance, when one predicts the success or failure of a student from academic aptitude measures, the researcher is concerned with criteria–related validity. The researcher attempts to develop or obtain an independent benchmark against which to match the measurement results. You may assess criterion validity by correlating the scaling results under study with other sets from another instrument administered simultaneously.

Reliability refers to the extent to which your data collection techniques or analysis procedures will yield consistent findings. You can assess reliability by posing the following three questions (Easterby-Smith et al., 2008:109):

1. Will the measures produce the same results on other occasions?
2. Will similar observations be reached by other observers/researchers?
3. Is there transparency in how you made sense of the raw data?

	Reliability	Validity
What does it tell you?	The extent to which the results can be reproduced when the research is repeated under the same conditions.	The extent to which the results really measure what they are supposed to measure.
How is it assessed?	By checking the consistency of results across time, across different observers, and across parts of the test itself.	By checking how well the results correspond to established theories and other measures of the same concept.
How do they relate?	A reliable measurement is not always valid: the results might be reproducible, but they're not necessarily correct.	A valid measurement is generally reliable: if a test produces accurate results, they should be reproducible.

Group Activity

- What are the main functions of a research design?
- Why is it important to have a research design before undertaking a study?
- Read the article you used for the group activity in unit 2, what reasons do the article's authors give for the choice of research design strategy

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