CHAPTER 4

General design issues

This chapter:

- develops a framework for designing a real world study linking purpose, conceptual framework, research questions, methods and sampling strategy;
- sensitizes the reader to the issues involved in selecting a research strategy;
- introduces experimental and non-experimental fixed design strategies;
- suggests that flexible design strategies particularly appropriate for real world studies include case studies, ethnographic studies and grounded theory studies;
- covers a range of multi-strategy (mixed-method) designs;
- emphasizes that it is advisable to read the other chapters in Part II before making decisions about strategy; and
- concludes by considering the trustworthiness of research findings, and its relationship to research design.

Introduction

Design is concerned with turning research questions into projects. This is a crucial part of any research project, but it is often slid over quickly without any real consideration of the issues and possibilities. There is a strong tendency, both for those carrying out projects and those who want them carried out, to assume that there is no alternative to their favoured approach. Comments have already been made on the assumption by many psychologists that an experimental design is inevitably called for. For other social scientists, and for quite a few clients when commissioning studies, designs involving the statistical analysis of sample survey data are seen as the only possible approach.
As stressed in the previous chapter, the strategies and tactics you select in carrying out a piece of research depend very much on the type of research question you are trying to answer. Hakim (2000), in one of the few books which focuses on design issues across a range of social science disciplines, makes a comparison between designers of research projects and architects, and then goes on to extend this to suggest that those who actually carry out projects are like builders. For her:

Design deals primarily with aims, purposes, intentions and plans within the practical constraints of location, time, money and availability of staff. It is also very much about style, the architect's own preferences and ideas (whether innovative or solidly traditional) and the stylistic preferences of those who pay for the work and have to live with the final result (p. 1, emphasis in original).

In small-scale research, the architect-designer and builder-researcher are typically one and the same person. Hence the need for sensitivity to design issues, to avoid the research equivalent of the many awful houses put up by speculative builders without benefit of architectural expertise.

Such muddling through should be distinguished from the opportunity to develop and revise the original plan, which is easier in a small-scale project than in one requiring the coordination of many persons' efforts. Design modification is more feasible with some research strategies than with others – it is an integral part of what are referred to in this text as flexible designs. However, this kind of flexibility calls for a concern for design throughout the project, rather than providing an excuse for not considering design at all.

A framework for research design

Design, in the sense discussed above, concerns the various things which should be thought about and kept in mind when carrying out a research project. Many models have been put forward and Figure 4.1 is my attempt. The components are:

![Diagram](image)

Figure 4.1: Framework for research design.
• **Purpose(s).** What is this study trying to achieve? Why is it being done? Are you seeking to describe something, or to explain or understand something? Are you trying to assess the effectiveness of something? Is it in response to some problem or issue for which solutions are sought? Is it hoped to change something as a result of the study?

• **Conceptual framework.** Your theory about what is going on, of what is happening and why. What are the various aspects or features involved, and how might they be related to each other?

• **Research questions.** To what questions is the research geared to providing answers? What do you need to know to achieve the purpose(s) of the study? What is it feasible to ask given the time and resources that you have available?

• **Methods.** What specific techniques (e.g. semi-structured interviews, participant observation) will you use to collect data? How will the data be analysed? How do you show that the data are trustworthy?

• **Sampling procedures.** Who will you seek data from? Where and when? How do you balance the need to be selective with that of collecting the data needed?

_Ethical considerations, though not included in the design framework, inevitably arise when carrying out research involving people and should be taken into account both in the planning and carrying out of your project (see Chapter 9)._  

All these aspects need to be interrelated and kept in balance. The diagram suggests that there is some directionality about the whole process. Both your purposes and the conceptual framework feed into it, and help you specify, the research questions. When you know something about the research questions you want to be answered, then you are able to make decisions about the methods and the procedures to be used when sampling. However, unless you are dealing with a fixed design which is tightly pre-specified, this should not be taken to imply a once only consideration of the different aspects.

In flexible designs there should be a repeated revisiting of all of the aspects as the research takes place. In other words, the detailed framework of the design _emerges_ during the study. The various activities of collecting and analysing data, of refining and modifying the set of research questions, of developing theory; of changing the intended sample to follow up interesting lines or to seek answers to rather different questions and perhaps even reviewing the purposes of the study in the light of a changed context arising from the way in which the other aspects are developing – are likely to be going on together.

This might suggest that a better representation of the relationship between these aspects in flexible designs would show two-way arrows between each of the components in the figure. Maxwell (2005, p. 5) approximates to this in a very similar diagram which he refers to as an ‘Interactive’ model of research design. Or even that one might revert to what Martin (1981) has called the ‘garbage can’ model of research design where such components are ‘swirling around in the garbage can or decision space of the particular research project’ (Grady and Wallston, 1988, p. 12). However, providing the interactive nature of what goes on in this kind of project is understood, Figure 4.1 has the advantage of presenting a simple and logical structure.
The design framework should have high compatibility between purposes, research questions, conceptual framework and sampling strategy. Some mismatches call for serious attention. For example:

• If the only research questions to which you can think of ways to get answers to are not directly relevant to the purposes of the study, then something has to change. Probably the research questions.
• If the methods and/or the sampling strategy are not providing answers to the research questions, something should change. Collect additional data and/or change the data collection method(s), extend the sampling or cut down on or modify the research questions.
• If there are research questions which do not link to the conceptual framework, or parts of the conceptual framework which are not represented in the set of research questions, then one or other (or both) needs changing.

This is something of a counsel of perfection. Don’t let it block any further progress if you can’t get it quite right. You may not get an ideal solution with the time and resources you have available. Go for a practical solution that seems reasonably adequate (an example of the strategy of satisficing as advocated by Simon, 1979).

In fixed research designs you should get as much of this right as you can before embarking on the major phase of data collection. Hence the importance of pilot work, where you have the opportunity of testing out the feasibility of what you propose. In flexible research designs you have to get all of this sorted out by the end of the study. As Brewer and Hunter (2005, p. 45) put it ‘Once a study is published, it is in many ways irrelevant whether the research problem prompted the study or instead emerged from it’. This is not a licence to rewrite history. In many qualitative research traditions there is an expectation that you provide an account of your journey, documenting the various changes made along the way. However, you are definitely not bound to some form of ‘honour code’ where, say, you declare your initial set of research questions and then stick to them through thick and thin. Your aim is to come up with a final set of research questions, which are relevant to the purposes of the study (which may, or may not, have been renegotiated along the way); and which show clear linkage to the conceptual structure (from whatever source it has obtained) and for which the sampling has been such that the data you have collected and analysed provides answers to those questions.

In the real world, of course, it won’t be as neat and tidy as this. Some research questions may remain stubbornly unanswerable given the amount of sampling and data collection your resources permit. This is not a capital offence. Providing you have answers to some of the questions which remain on your agenda, then you have made worthwhile progress. And the experience will no doubt be salutary in helping you to carry out more realistically designed projects in the future. You could even claim this for a study where you ended up with no answers to relevant research questions, but this is not going to further your career as a researcher.

It may also be that you come up with unexpected findings which appear interesting and illuminative. These findings may well be assimilable into your framework by appropriate extension or modification of your research questions. There is nothing wrong with adding a further question providing it is relevant to your purposes and it can
be incorporated within a (possibly modified) theoretical framework. If your ingenuity fails, and you can’t link it in, then simply regard this as a bonus to be reported under the heading of ‘an interesting avenue for further research’.

Getting a feel for design issues

The shaded pages below give an overview of what is involved in choosing a research strategy, including a short description of the strategies you might consider.

This might be a good time for you to get hold of the reports of a range of published studies (journal articles, research reports, dissertations, etc.) and to read them through to get a feel for different designs. Try not to get bogged down in the details, and don’t be put off by complex analyses. When you get on to the detailed design of your own study and its analysis, you can seek assistance on such matters. The obvious sources are academic and professional journals close to your own concerns but, as previously suggested, there is a lot to be said for ‘spending some time in the next village’. If your field is, say, social work, browse through a few health-related, educational or management journals. The purpose here is not so much to build up knowledge of directly relevant literature, or to find something you can replicate, although both of these are reputable aims in their own right. It’s the overall design that you are after. The website gives details of a mixed bag of studies with fixed, flexible and multi-strategy designs worth chasing up and looking through. Note that they won’t necessarily use the terminology adopted here of research questions, purposes, etc. (it is instructive to try to work these out as an exercise).

The website gives references to a selection of examples of research using fixed, flexible and multi-strategy designs.

If you follow up these examples you will notice that several of them involve evaluating some practice, intervention or programme, or have an action perspective where they are concerned with change of some kind taking place. Chapter 8 covers the additional features to be considered in studies which have these purposes.

Choosing a Research Design Strategy

This section seeks to sensitise you to the issues involved in choosing a research design strategy.

A. Is a FIXED, FLEXIBLE or MULTI-STRATEGY design strategy appropriate?
   - A fixed design calls for a tight pre-specification before you reach the main data collection stage. If you can’t pre-specify the design, don’t use the fixed approach. Data are almost always in the form of numbers; hence this type is commonly referred to as a quantitative strategy. See Chapter 5 for details.
• A flexible design evolves during data collection. Data are typically non-numerical (usually in the form of words); hence this type is often referred to as a qualitative strategy. See Chapter 6 for details.

• A multi-strategy design combines substantial elements of both fixed and flexible design. A common type has a flexible phase followed by a fixed phase (the reverse sequence is more rare). See Chapter 7 for details.

Note: Flexible designs can include the collection of small amounts of quantitative data (Chapter 6, p. 135) Similarly, fixed designs can include the collection of small amounts of qualitative data (Chapter 5, p. 81).

B. Is your proposed study an EVALUATION?
Are you trying to establish the worth or value of something such as an intervention, innovation or service? This could be approached using either a fixed, flexible or multi-strategy design strategy depending on the specific purpose of the evaluation. If the focus is on outcomes, a fixed design is probably indicated, if it is on processes, a flexible design is probably preferred. Many evaluations have an interest in both outcomes and processes and use a multi-strategy design. See Chapter 8, p. 176, for details.

C. Do you wish to carry out ACTION RESEARCH?
Is an action agenda central to your concerns? This typically involves direct participation in the research by others likely to be involved, coupled with an intention to initiate change. A flexible design is almost always used. See Chapter 8, p. 188, for details.

D. If you opt for a FIXED design strategy, which type is most appropriate?
Two broad traditions are widely recognized; experimental and non-experimental designs. Box 4.1 on p. 78 summarizes their characteristics.

E. If you opt for a FLEXIBLE design strategy, which type is most appropriate?
Flexible designs have developed from a wide range of very different traditions. Three of these are widely used in real world studies. These are case studies, ethnographic studies and grounded theory studies. Box 4.2 on p. 79 summarizes their characteristics.

F. If you are considering a MULTI-STRATEGY design strategy, which type is most appropriate?
It may well be that a strategy which combines fixed and flexible design elements seems to be appropriate for the study with which you are involved. One or more case studies might be linked to an experiment. Alternatively, a small experiment might be incorporated actually within a case study. Issues involved in the carrying out of multi-strategy designs are discussed in Chapter 7.

Note: The research strategies discussed above by no means cover all possible real world research designs. They are more of a recognition of the camps into which researchers have tended to put themselves, signalling their preferences for certain ways of working. Such camps have the virtue of providing secure bases within which fledgling researchers can be inculcated in the ways of the tribe, and, more generally, high professional standards can be maintained. They carry the danger of research being 'strategy driven' in the
sense that someone skilled in, say, doing experiments assumes automatically that every problem has to be attacked through that strategy.

G. The purpose(s) helps in selecting the strategy

The strategies discussed above represent different ways of collecting and analysing empirical evidence. Each has its particular strengths and weaknesses. It is also commonly suggested that there is a hierarchical relationship between the different strategies, related to the purpose of the research; that:

- flexible (qualitative) strategies are appropriate for exploratory work;
- non-experimental fixed strategies are appropriate for descriptive studies;
- experiments are appropriate for explanatory studies.

There is some truth in this assertion – certainly as a description of how the strategies have tended to be used in the past. There is a further sense in which a flexible strategy lends itself particularly well to exploration, a sense in which certain kinds of description can be readily achieved using non-experimental (typically survey approaches) and a traditional view that the experiment is a particularly appropriate tool for getting at cause and effect relationships (although see the discussion in Chapter 2, p. 32). However, these are not necessary or immutable linkages. Each strategy (fixed, flexible or multi-strategy) can be used for any or all of the purposes. For example, grounded theory studies aim to be explanatory through the development of theory; also there can be, and have been, exploratory, descriptive and explanatory case studies (Yin, 2003, 2009).

Real world studies are very commonly evaluations, i.e. their purpose is to assess the worth or value of something. A fixed, flexible or multi-strategy design may be appropriate depending on the specific focus of the evaluation (see B above).

If a purpose is to initiate change and/or to involve others, then an action research strategy may be appropriate. A flexible design is probably called for (see C above).

H. The research questions have a strong influence on the strategy to be chosen

While purpose is of help in selecting the research design strategy, the type of research questions you are asking is important. For example, questions asking ‘how many?’ or ‘how much?’ or ‘who’ or ‘where’ suggest the use of a non-experimental fixed strategy such as a survey. ‘What’ questions concerned with ‘what is going on here?’ lend themselves to some form of flexible design study. ‘How?’ and ‘why?’ questions are more difficult to pin down. They often indicate a flexible design. However, if the research can have control over events and if there is substantial prior knowledge about the problem and the likely mechanisms involved, then an experiment might be indicated.

Box 4.3 on p. 80 considers the research questions set out in Box 3.3, p. 60, and discusses research strategies that might be appropriate.

I. Specific methods of investigation need not be tied to particular research strategies

The methods or techniques used to collect information, what might be called the tactics of enquiry, such as questionnaires or various kinds of observation, are
sometimes regarded as necessarily linked to particular research strategies. Thus, in fixed non-experimental designs, surveys may be seen as being carried out by structured questionnaire and experiments through specialized forms of observation, often requiring the use of measuring instruments of some sophistication. In flexible designs, grounded theory studies were often viewed as interview-based and ethnographic studies seen as entirely based on participant observation.

However, this is not a tight or necessary linkage. For example, while participant observation is a central feature of the ethnographic approach, it can be augmented by interviews and documentary analysis. Similarly, there is no reason in principle for particular fixed design studies to be linked to specific data collection techniques. Non-experimental surveys could well be carried out using observation, the effect of an experiment assessed through questionnaire responses.

You should now some appreciation of what is involved in selecting an appropriate research strategy. Before plunging in and making a decision, you need to know more about the issues involved in working within these strategies to help you get a feel for what might be involved. The rest of the chapters in Part II cover them in some detail.

Establishing trustworthiness

How do you persuade your audiences, including yourself, that the findings of your research are worth taking account of? What is it that makes the study believable and trustworthy? What are the kinds of argument that you can use? What questions should you ask? What criteria are involved?

In this connection validity and generalizability are central concepts. Validity is concerned with whether the findings are 'really' about what they appear to be about. Generalizability refers to the extent to which the findings of the enquiry are more generally applicable outside the specifics of the situation studied. These issues, together with the related one of reliability (the consistency or stability of a measure; for example, if it were to be repeated would the same result be obtained), were initially developed in the context of traditional fixed designs and there is considerable debate about their applicability to flexible designs. Hence trustworthiness is considered separately in each of the following chapters covering different types of research designs.

Further reading

The website gives annotated references to further reading for Chapter 4.
**Experimental and non-experimental fixed design research strategies**

**Experimental strategy**

The central feature is that the researcher actively and deliberately introduces some form of change in the situation, circumstances or experience of participants with a view to producing a resultant change in their behaviour.

In ‘experiment-speak’ this is referred to as measuring the effects of manipulating one variable on another variable. The details of the design are fully pre-specified before the main data collection begins (there is typically a ‘pilot’ phase before this when the feasibility of the design is checked and changes made if needed).

Typical features:

- selection of samples of individuals from known populations;
- allocation of samples to different experimental conditions;
- introduction of planned change on one or more variables;
- measurement on very small number of variables;
- control of other variables; and
- testing of formal hypotheses.

**Non-experimental strategy**

The overall approach is the same as in the experimental strategy but the researcher does not attempt to change the situation, circumstances or experience of the participants.

The details of the design are fully pre-specified before the main data collection begins (there is typically a ‘pilot’ phase before this when the feasibility of the design is checked and changes made if needed).

Typical features:

- selection of samples of individuals from known populations;
- allocation of samples to different experimental conditions;
- measurement on relatively small number of variables;
- control of other variables; and
- may or may not involve hypothesis testing.
Three widely used flexible design research strategies

Case study

Development of detailed, intensive knowledge about a single ‘case’, or of a small number of related ‘cases’.

The details of the design typically ‘emerge’ during data collection and analysis.

Typical features:

- selection of a single case (or a small number of related cases) of a situation, individual or group of interest or concern;
- study of the case in its context; and
- collection of information via a range of data collection techniques including observation, interview and documentary analysis (typically, though not necessarily exclusively, producing qualitative data).

Ethnographic study

Seeks to capture, interpret and explain how a group, organization or community live, experience and make sense of their lives and their world.

It typically tries to answer questions about specific groups of people, or about specific aspects of the life of a particular group.

Typical features:

- selection of a group, organization or community of interest or concern;
- immersion of the researcher in that setting; and
- use of participant observation.

Grounded theory study

The central aim is to generate theory from data collected during the study.

Particularly useful in new, applied areas where there is a lack of theory and concepts to describe and explain what is going on. Data collection, analysis and theory development and testing interspersed throughout the study.

Typical features:

- applicable to a wide variety of phenomena;
- commonly interview-based; and is
- a systematic but flexible research strategy which provides detailed prescriptions for data analysis and theory generation.

Notes: There are many other types of flexible design, some of which are summarized in Chapter 6. Many studies involving flexible designs focus on a particular ‘case’ in its context and can be conceptualized as case studies. Case studies can follow an ethnographic or grounded theory approach, but don’t have to.
BOX 4.3

Linking research questions to research strategy

Consider the research questions discussed in Box 3.3 (p. 60):

1. Do the children read better as a result of this programme?
   or
2. Do the children read better in this programme compared with the standard programme?
   or
3. For what type of special need, ability level, class organization or school is the programme effective?

   If the interest is in quantitative outcome measures, and it is feasible to exert some degree of control over the situation (e.g. setting up different groups of children for the innovatory and standard programmes), these questions could be approached using an *experimental strategy*. If random allocation is used, this becomes a *true experiment*; if not, a *quasi-experiment*.

   If this control were not feasible, or not desired, but quantitative data were still sought, a *non-experimental fixed design* is possible.

   If there is a broader notion of what is meant by 'reading better' or of an 'effective' programme than that captured by a small number of quantitative variables, some type of *flexible strategy* is called for. This is likely to be a *multimethod case study*, and could also be *ethnographic* or *grounded theory* in style.

   A *multi-strategy* approach where the *case study* could incorporate, say, an *experimental* component, could be considered.

4. What is the experience of children following the programme?
5. What are teachers' views about the programme?
   and/or
6. To what extent are parents involved in and supportive of the programme?

   These questions could be approached using any of the flexible strategies; though (4) might particularly indicate an *ethnographic* approach.

   Questions (5) and (6) could, alternatively or additionally, follow a *non-experimental fixed design* if quantitative data are sought.

   The overall message is that, while the research questions help in deciding research strategy, much is still dependent on your own preferences and on the type of design and data which are going to speak most strongly to the stakeholders.