1 Research and the Research Problem

Aims

- **To explain what research is, and what it is not, and the objectives of research**
- **To outline the different types of research**
- **To discuss the research process**
- **To introduce the concept at the heart of any research project – the research problem – and to discuss what a researchable problem is**
- **To warn of common mistakes**
- **To describe how to choose your research strategy and plan your research project**

Introduction

The shortest way of describing the contents of this chapter is to say that it provides a starting point for your research efforts.

It introduces the concept of research as understood in the academic world, and contrasts it to the loose way the word 'research' is used in everyday speech. However, even in the academic world, the nature of research is the subject of a great deal of debate. The characteristics of scientific method are briefly explained, and the interpretivist alternative is discussed as one of the aspects of the debate about research methods. This debate is treated in much greater detail in Chapter 2. An overview of the research process is given showing various ways to illustrate it.

research problem

An essential early step in the process of research is to find a **research problem**. What a research problem is, and how to find one, are explained. The nature of your problem will, in its turn, influence the form of your research. It is this quest for a problem which forms the task in the final section, where what you have learned in the earlier sections is applied to your own subject.

Key words are shown in bold and are repeated in the margin so you can scan through the chapter to check up on their meaning.

What is Research?

'Research' is a term loosely used in everyday speech to describe a multitude of activities, such as collecting masses of information, delving into esoteric theories, and producing wonderful new products. It is important that a student or practitioner embarking on a programme of academic or practical research has a clear idea of what the word 'research' really means, and clears away any misconceptions that might exist owing to the word's common use in other fields.

It is, therefore, worth looking at a few of the ways that the word is used in common language to describe activities, often called research, which are *not*

research in its real meaning, and also at some of the emotive language that surrounds the term.

These are some of the ways in which the term 'research' is *wrongly* used:

1 *As a mere gathering of facts or information:* 'I'll go and do a bit of research into the subject.' This usually means quickly reading through a few books or magazines to become better informed about something. Such information can be collected in other ways too, e.g. by asking people questions in the street or by recording the number of vehicles driving along a road. This kind of activity may more accurately be called 'collection of information', and can be carried out in a systematic and thorough way. It certainly can be seen as an important *part* of research.
2 *Moving facts from one situation to another:* 'I have done my research, and come up with this information which I present in this paper.' It is easy to collect information and reassemble it in a report or paper, duly annotated and referenced, and think of it as research. However, even if the work is meticulously carried out, and brings enlightenment about the subject to the author and the reader, one vital ingredient of the research process is missing – the interpretation of the information. One might call this form of activity 'assembly of information'. This is, as with the collection of information, an important component of research, but not its entirety.
3 *As an esoteric activity, far removed from practical life:* 'He's just gone back into his laboratory to bury himself in his research into the mysterious processes of bimolecular fragmentation.' While many research projects deal with abstract and theoretical subjects, it is often forgotten that the activity of research has greatly influenced all aspects of our daily lives and created our understanding of the world. It is an activity that is prompted by our need to satisfy our natural curiosity and our wish to make sense of the world around us.
4 *As a word to get your product noticed*: 'Years of painstaking research have produced this revolutionary, labour-saving product!' Very often the term 'research' is used in an emotive fashion in order to impress and build confidence. If you ask for evidence of the research process and methodology, you are likely to be faced with incomprehension, muddled thinking, and possibly even worse: the product may be the outcome of mere guesswork!

So how can true research be defined? Box 1.1 suggests some alternatives.

Box 1.1 Definitions of research

The *Oxford Encyclopaedic English Dictionary* defines research as:

a the systematic investigation into the study of materials, sources etc. in order to establish facts and reach new conclusions

(Continued)

(Continued)

b an endeavour to discover new or collate old facts etc. by the scientific study of a subject or by a course of critical investigation. (OEED, 1991, p. 1228)

Leedy defines it from a more utilitarian point of view:

> Research is a procedure by which we attempt to find systematically, and with the support of demonstrable fact, the answer to a question or the resolution of a problem. (1989, p. 5)

Dominowski is so terse in his definition that he seems to miss the point (see above):

> Research is a fact-finding activity. (1980, p. 2)

Kerlinger uses more technical language to define it as:

> the systematic, controlled, empirical and critical investigation of hypothetical propositions about presumed relations among natural phenomena. (1970, p. 8)

You could go on finding definitions of research, which would, as in the examples in the box, differ in emphasis and scope. What is certain is that there are many different opinions about and approaches to research. However, as a means of achieving a greater comprehension of our world, research distinguishes itself from the two other basic and more ancient means, those of experience and reasoning.

experience

Briefly, **experience** results in knowledge and understanding gained either individually or as a group or society, or shared by experts or leaders, through day-to-day living. Reflective awareness of the world around us, present to a degree even in other mammals, provides invaluable knowledge. The most immediate form of experience is personal experience, the body of knowledge gained individually through encountering situations and events in life. A child learns to walk by trial and error, and an adult gets adept at decorating jobs in the house after renovating several rooms. When solutions to problems are not to be found within the personal experience of an individual, then he or she may turn to those who have wider or more specialist experience for advice, for example a solicitor in legal matters. Beyond this are the 'experts' who have written books on particular subjects, e.g. health care or the finer points of playing golf.

Knowledge gained from experience forms an essential aid to our understanding and activities in everyday life. However, it does have severe limitations as a means of methodically and reliably extending knowledge and understanding of the world. This is because learning from experience tends to be rather haphazard and uncontrolled. Conclusions are often quickly drawn and not exhaustively tested, 'common

Figure 1.1 Knowledge gained from experience forms an essential aid to our understanding and activities in everyday life

sense' is invoked as self-evident, and the advice of experts is frequently misplaced or seen as irrelevant. Despite these shortcomings, experience can be a valuable starting point for systematic research, and may provide a wealth of questions to be investigated and ideas to be tested.

reasoning

Reasoning is a method of coming to conclusions by the use of logical argument. There are three basic forms of argument: deductive, inductive and a combination of both called inductive/deductive (or hypothetico-deductive, or scientific method). Deductive reasoning was first developed by the Ancient Greeks, and was refined by Aristotle through his deductive syllogisms. An argument based on deduction begins with general statements and, through logical argument, comes to a specific conclusion. A syllogism is the simplest form of this kind of argument and consists of a major general premise (statement), followed by a minor, more specific premise, and a conclusion which follows logically. Here is a simple example:

All live mammals breathe.	– general premise
This cow is a live mammal.	– specific premise
Therefore, this cow breathes.	– conclusion

Inductive argument works the other way round. It starts from specific observations and derives general conclusions therefrom. Its logical form cannot be so neatly encapsulated in a three-line format, but a simple example will demonstrate the line of reasoning:

All swans that have been observed are white in colour.	– specific observations
Therefore one can conclude that all swans are white.	– general conclusion

The value of inductive argument was revealed by Bacon in the 1600s. By careful and systematic observation of the events in the world around us, many theories have been evolved to explain the rules of nature. Darwin's theory of evolution and Mendel's discovery of genetics are perhaps the most famous theories claimed (even by their authors) to be derived from inductive argument.

However, deductive reasoning was found to be limiting because it could only handle certain types of statement, and could become increasingly divorced from observation and experience. Purely inductive reasoning proved to be unwieldy and haphazard, and in practice was rarely applied to the letter. Medawar (1969, pp. 10–11) quoted Darwin writing in his sixth edition of *Origin of Species*, where he said of himself that he 'worked on true Baconian principles, and without any theory collected facts on a wholesale scale', but later on he admitted he could not resist forming a hypothesis on every subject.

When inductive and deductive argument were combined to form inductive/deductive argument, the to-and-fro process of developing hypotheses (testable theories) inductively from observations, charting their implications by deduction, and testing them to refine or reject them in the light of the results, formed a powerful basis for the progress of knowledge, especially of scientific knowledge, and is now commonly referred to as scientific method.

It is the combination of experience with deductive and inductive reasoning which is the foundation of modern scientific research. Three characteristics of research can be seen to distinguish it from gaining knowledge either purely by experience or by reasoning, as shown in Box 1.2.

Box 1.2 Three characteristics of research

1 Gaining experience is an uncontrolled and haphazard activity, while research is systematic and controlled.
2 Reasoning can operate in an abstract world, divorced from reality, while research is empirical and turns to experience and the world around us for validation.
3 Unlike experience and reason, research aims to be self-correcting. The process of research involves rigorously testing the results obtained, and methods and results are open to public scrutiny and criticism.

In short:

> Research is a combination of both experience and reasoning and must be regarded as the most successful approach to the discovery of truth. (Cohen and Manion, 1994, p. 5)

When we talk about this type of systematic research, it is usually assumed that it makes use of the rigorous and questioning techniques of scientific enquiry. This form of enquiry is called scientific method.

What it is for – the Objectives of Research

Research can have several legitimate objectives, either singly or in combination. The main, overriding objective must be that of gaining useful or interesting knowledge. Reynolds (1971, pp. 4–11) listed five things that he believed most people expected scientific knowledge to provide. These, together with one that I have added myself, can conveniently be used as the basis for a list of the possible objectives of research, as in Box 1.3.

Box 1.3 Objectives of research

- Categorization
- Explanation
- Prediction
- Creating a sense of understanding
- Providing potential for control
- Evaluation

categorization

Categorization involves forming a typology of objects, events or concepts. This can be useful in explaining what 'things' belong together and how. One of the main problems is to decide on the most useful methods of categorization, depending on the reasons for attempting the categorization in the first place. Following from this is the problem of determining what criteria to use to judge the usefulness of the categorization. Two obvious criteria are mentioned by Reynolds: that of exhaustiveness, by which all items should be able to be placed into a category, without any being left out; and that of mutual exclusiveness, by which each item should, without question, be appropriately placed into only one category. Finally, it should be noted that the typologies must be consistent with the concepts used in the theoretical background to the study.

explanation

There are many events and issues that we do not fully, or even partly, understand. The objective of providing an **explanation** of particular phenomena has been a common one in many forms of research.

prediction

On the basis of an explanation of a phenomenon it is often possible to make a **prediction** of future events related to it. In the natural sciences these predictions are often made in the form of abstract statements, for example given C_1, C_2, … , C_n, if X, then Y. More readily understood are predictions made in text form, for example: if a person disagrees with a friend about his attitude toward an object, then a state of psychological tension is produced.

sense of understanding

Whilst explanation and prediction can reveal the inner workings of phenomena, i.e. what happens and when, they do not always provide a **sense of understanding** of phenomena – how or why they happen. A complete explanation of a phenomenon will require a wider study of the processes which surround the phenomenon and influence it or cause it to happen.

control

A good level of understanding of a phenomenon might lead to the possibility of finding a way to **control** it. Obviously, not all phenomena lend themselves to this: for example, it is difficult to imagine how the disciplines of astronomy or geology could include an element of control. But all of technology is dependent on the ability to control the behaviour, movement or stability of things. Even in society there are many attempts, often based on scientific principles, to control events such as crime, poverty, the economy etc., though the record of success is more limited than in the natural sciences, and perhaps there are cases of attempting the impossible. The problem is that such attempts cannot be truly scientific as the variables cannot all be controlled, nor can one be certain that all relevant variables have been considered. The crucial issue in control is to understand how certain variables affect one another, and then be able to change the variables in such a way as to produce predictable results.

evaluation

Evaluation is making judgements about the quality of objects or events. Quality can be measured either in an absolute sense or on a comparative basis. To be useful, the methods of evaluation must be relevant to the context and intentions of the research. For example, level of income is a relevant variable in the evaluation of wealth, while degree of marital fidelity is not. Evaluation goes beyond measurement, as it implies allotting values to objects or events. It is the context of the research which will help to establish the types of values that should be used.

Types of Research

The different kinds of questions which instigate research require approaches to research that are distinguished by their theoretical background and methodologies. A brief summary of various types of research will illustrate the possibilities for your research efforts.

Several major types of research can be identified, as in Box 1.4. Writers differ in how they distinguish between them, and some catalogue many more types than those listed.

Box 1.4 Major types of research

1 Historical
2 Comparative
3 Descriptive
4 Correlation
5 Experimental
6 Evaluation
7 Action
8 Ethnogenic
9 Feminist
10 Cultural

I will use these types as convenient overall headings and include under them a variety of approaches which share some common features.

Historical

Historical research has been defined as the systematic and objective location, evaluation and synthesis of evidence in order to establish facts and draw conclusions about past events (Borg, 1963).

It involves exploring the meaning and relationship of events, and as its resource it uses primary historical data in the form of historic artefacts, records and writings. It attempts to find out what happened in the past and to reveal reasons for why and how things happened. An interesting aspect of the values of historical research as categorized by Hill and Kerber (1967), listed in Box 1.5, is the relationship the past can have with the present and even the future.

Box 1.5 Values of historical research

- It enables solutions to contemporary problems to be sought in the past.
- It throws light on present and future trends.
- It stresses the relative importance and the effects of the interactions that are found within all cultures.
- It allows for the revaluation of data supporting selected hypotheses, theories and generalizations that are presently held about the past.

Historical evidence, consisting of primary historical data, must be scrutinized from two points of view. The first is to ascertain whether the artefact or document to be studied is genuine. There have been many mistakes made in the past, either through a lack of analytical rigour by over-enthusiastic researchers, or through fraud. (You might remember the Piltdown Skull, fraudulent skull bones which researchers long believed to be the 'missing link' in human history.) The second is to examine, in written evidence in the form of historic documents etc., the authenticity of the contents. What is the meaning of what is written, and how accurate is it? For example, many authentic medieval texts are known to be wildly inaccurate and vague in their descriptions of events.

Figure 1.2 The first is to ascertain whether the artefact to be studied is genuine

According to Gottschalk (1951), the questions of where, which, when and what are crucial in identifying the four aspects of historical research which determine the scope of a study, as shown in Box 1.6.

Box 1.6 Aspects of historical research that determine scope

1 Where the events took place.
2 Which people were involved.
3 When the events occurred.
4 What kind of human activity was involved.

The degree to which an aspect is studied can be varied, i.e. the number of human activities examined can be increased or decreased, the time-span covered can be extended or contracted etc. It must be remembered that the mere collection of historic facts, or the setting up of chronologies of events, does not constitute research. Although these are a necessary part of historical research, an **interpretation** of the meanings and an assessment of the significance of the events are required.

interpretation

Historic research is not based purely on scientific method. For instance, the data used are seldom based on direct observation or experimentation. But it should share many of the disciplines of scientific method, such as objectivity and the desire to minimize bias and distortion, the use of scientific techniques such as chemical and radioactive analysis, and statistics. The problem for historians tends to be the paucity of information, while scientists are often overwhelmed by it!

All research students, whatever their chosen field of study, have to undertake a review of the literature. This is a study of what has been done and written in the past, and so the principles of historical research can be seen to be of direct relevance to this part of their work.

Comparative

Comparative research is often used together with historical research. Researchers compare people's experience of different societies, either between times in the past or in parallel situations in the present. These studies can be on the macro level, e.g. studying the role of revolutions in class struggle, or on the micro level, e.g. individual experiences in different types of marriage.

It is often easier to understand phenomena when they are compared with similar phenomena from another time or place. Culture and society rely heavily on what has gone before and often use references from the past to justify the present. The constitution, the tax system, social mores are all rooted in their own histories. Similarly, place also determines that phenomena develop differently.

The study and comparison of differences help to reveal the origins and development of social phenomena, locating them in a certain time and place, and thus defeating claims that they are universal and atemporal.

Many social theories are presented as if the generalizations that they embody are valid for all times and places, when in fact they were arrived at on the basis of limited contemporary Western experience (Llobera, 1998, p. 74).

We can also learn by making comparisons both with the past and with experiences elsewhere. It would be foolish for politicians to introduce, say, sweeping changes to the electoral system, without carefully studying the effects of such changes in the past and in other situations.

Experimental research (described below), where the researcher can artificially control causal factors, is not really possible in social research. However, the idea is put forward that history and comparison can often supply the researcher with what is a natural experiment. According to Mill's method of agreement (one of his five 'methods of experimental enquiry' devised in the nineteenth century), 'If two or more instances of the phenomenon under investigation have only one circumstance in common, the circumstances in which alone all the instances agree is the cause (or effect) of the given phenomenon' (1973, p. 390). Using this test it is possible to compare the suggested causes of several instances of a phenomenon (e.g. an industrial strike) and eliminate those that are not present in all instances as being non-essential to the occurrence of the phenomenon. For example, reasons for striking could be trade union power struggles, poor working conditions, resistance to change, low pay, unfair labour relations etc. If, say, one cause only is present in all cases, e.g. unfair labour relations, then one could conclude that this is likely to be the determining cause. One could then check to see if a situation where unfair labour relations did not result in a strike could be found. If not, then this would support the foregoing conclusion.

This kind of comparative exercise to explore and test causal factors is an emblem of good research of this type, and helps to overcome the fact that the researcher has no control over the available variables.

Descriptive

Instead of examining record or artefacts, descriptive research relies on observation as a means of collecting data. It attempts to examine situations in order to establish what is the norm, i.e. what can be predicted to happen again under the same circumstances.

'Observation' can take many forms. Depending on the type of information sought, people can be interviewed, questionnaires distributed, visual records made, even sounds and smells recorded. The important point is that the observations are written down or recorded in some way, in order that they can be subsequently analysed. It is important that the data so collected are organized and presented in a clear and systematic way, so that the analysis can result in valid and accurate conclusions.

The scale of the research is influenced by two major factors, identified in Box 1.7.

Box 1.7 Influence on scale of descriptive research

1 The level of complexity of the survey.
2 The scope of the survey.

For example, seeking relationships between specific events inevitably requires a more complex survey technique than aiming merely to describe the nature of existing conditions. Likewise, surveying a large number of cases over a wide area will require greater resources than a small, local survey.

In order both to save on unnecessary work and to give accurate information on the subject of your research, the sample of people or events surveyed (technically called the population) must be carefully chosen and delineated. To do this, it is necessary to be aware of the precise subject focus of the research so that specific objectives can be formulated.

As descriptive research depends on human observations and responses, there is a danger that distortion of the data can occur. This can be caused, among other ways, by inadvertently including biased questions in questionnaires or interviews, or through selective observation of events. Although bias cannot be wholly eliminated, an awareness of its existence and likely extent is essential.

Correlation

The information sought in correlation research is expressed not in the form of artefacts, words or observations, but in numbers. While historical and descriptive approaches are predominantly forms of qualitative research, analytical survey or correlation research is principally quantitative. 'Correlation' is another word to describe the measure of association or the relationships between two phenomena.

In order to find meaning in the numerical data, the techniques of statistics are used. What kind of statistical tests are used to analyse the data depends very much on the nature of the data.

This form of quantitative research can be broadly classified into two types of studies, as shown in Box 1.8.

Box 1.8 Types of quantitative studies

1 Relational studies.
2 Prediction studies.

The first is an investigation of possible relationships between phenomena to establish if a correlation exists and, if so, its extent. This exploratory form of research is carried out particularly where little or no previous work has been done, and its outcomes can form the basis for further investigations.

Prediction studies tend to be carried out in research areas where correlations are already known. This knowledge is used to predict possible future behaviour or events, on the basis that if there has been a strong relationship between two or more characteristics or events in the past, then these should exist in similar circumstances in the future, leading to predictable outcomes.

In order to produce statistically significant results, quantitative research demands data from a large number of cases. Greater numbers of cases tend to produce more reliable results; 20–30 is considered to be about the minimum, though this depends on the type of statistical test applied. The data, whatever their original character, must be converted into numbers.

One of the advantages of correlation research is that it allows for the measurement of a number of characteristics (technically called variables) and their relationships simultaneously. Particularly in social science, many variables contribute to a particular outcome (e.g. satisfaction with housing depends on many factors). Another advantage is that, unlike other research approaches, it produces a measure of the *amount* of relationship between the variables being studied. It also, when used in prediction studies, gives an estimation of the probable accuracy of the predictions made. One limitation to what can be learned from correlation research is that, while the association of variables can be established, the cause and effect relationships are not revealed.

Experimental

Experimental research differs from the other research approaches noted above through its greater control over the objects of its study. The researcher strives to isolate and control every relevant condition that determines the events investigated, so as to observe the effects when the conditions are manipulated. Chemical experiments in a laboratory represent one of the purest forms of this research type.

At its simplest, an experiment involves making a change in the value of one variable – called the independent variable – and observing the effect of that change on another variable – called the dependent variable (Cohen and Manion, 1994, p. 164).

Thus, the most important characteristic of the experimental approach is that it deals with the phenomenon of 'cause and effect'.

However, the actual experiment is only a part of the research process. There are several planned stages in experimental research. When the researcher has established that the study is amenable to experimental methods, a prediction (technically called a hypothesis) of the likely cause and effect patterns of the phenomenon has to be made. This allows decisions to be made as to what variables are to be tested and how they are to be controlled and measured. This stage, called the design of the experiment, must also include the choice of relevant types of test and methods of

analysing the results of the experiments (usually by statistical analysis). Pre-tests are then usually carried out to detect any problems in the experimental procedure.

Only after this is the experiment proper carried out. The procedures decided upon must be rigorously adhered to and the observations meticulously recorded and checked. Following the successful completion of the experiment, the important task – the whole point of the research exercise – is to process and analyse the data and to formulate an interpretation of the experimental findings.

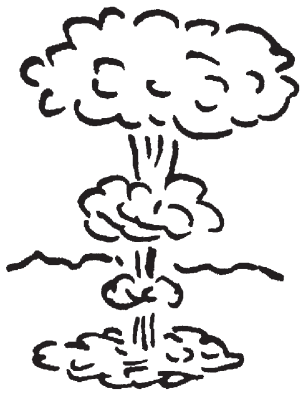

Figure 1.3 Not all experimental research has to, or even can, take place in a laboratory

Not all experimental research has to, or even can, take place in a laboratory. The experimental methods used must take account of how much it is possible to control the variables. Writers of textbooks on research have classified experimental designs in different ways. As an example, Campbell and Stanley (1966) make their categorization into four classes as shown in Box 1.9, which can be regarded as a useful starting point for discussing their different characteristics.

Box 1.9 Classes of experiments

1 Pre-experimental.
2 True experimental.
3 Quasi-experimental.
4 Correlation and *ex post facto*.

Pre-experimental designs are unreliable and primitive experimental methods in which assumptions are made despite the lack of essential control of variables. An

example of this is the supposition that, faced with the same stimulus, all samples will behave identically to the one tested, despite possible differences between the samples.

True experimental designs are those that rigorously check the identical nature of the groups before testing the influence of a variable on a sample of them in controlled circumstances. Parallel tests are made on identical samples (control samples) which are not subjected to the variable.

In quasi-experimental designs, not all of the conditions of true experimental design can be fulfilled. The nature of the shortcomings is however recognized, and steps are taken to minimize them or predict a level of **reliability** of the results. The most common case is when a group is tested for the influence of a variable and compared with a non-identical group with known differences (control group) which has not been subjected to the variable. Another, in the absence of a control group, is repeated testing over time of one group, with and without the variable (i.e. the same group acts as its own control at different times).

reliability

Correlation design looks for cause and effect relationships between two sets of data, while *ex post facto* designs turn experimentation into reverse, and attempt to interpret the nature of the cause of a phenomenon by the observed effects. Both of these forms of research result in conclusions which are difficult to prove and they rely heavily on logic and inference.

Evaluation

This is a descriptive type of research specifically designed to deal with complex social issues. It aims to move beyond 'just getting the facts' in order to make sense of the myriad human, political, social, cultural and contextual elements involved. The latest form of this type of research, named by Guba and Lincoln (1989) as fourth-generation evaluation, has, according to them, six properties, as in Box 1.10.

Box 1.10 Properties of evaluation research

1. The evaluation outcomes are not intended to represent 'the way things really are, or how they work', but present the meaningful constructions which the individual actors or groups of actors create in order to make sense of the situations in which they find themselves.
2. In representing these constructions, it is recognized that they are shaped to a large extent by the values held by the constructors. This is a very important consideration in a value-pluralistic society, where groups rarely share a common value system.

3 These constructions are seen to be inextricably linked to the particular physical, psychological, social and cultural contexts within which they are formed and to which they refer. These surrounding conditions, however, are themselves dependent on the constructions of the actors which endow them with parameters, features and limits.
4 It is recognized that the evaluation of these constructions is highly dependent on the involvement and viewpoint of the evaluators in the situation studied.
5 This type of research stresses that evaluation should be action-oriented, define a course that can be practically followed, and stimulate the carrying out of its recommendations. This usually requires a stage of negotiation with all the interested parties.
6 Due regard should be given to the dignity, integrity and privacy of those involved at any level, and those who are drawn into the evaluation should be welcomed as equal partners in every aspect of design, implementation, interpretation and resulting action. (Guba and Lincoln, 1989, pp. 8–11)

models

There are a range of different approaches or evaluation **models**. Two of them are systems analysis and responsive evaluation.

Systems analysis is a holistic type of research, which reverses the three-stage order of thinking which is typical of scientific enquiry, i.e. breaking the problem or phenomenon to be investigated down into researchable parts, then separately evaluating the parts, and finally aggregating these evaluations into an explanation of the whole. In systems analysis, there are also three stages, but they start from appraising the whole, as in Box 1.11.

Box 1.11 Stages of systems analysis

1 Identifying an encompassing whole (system) of which the phenomenon or problem is a part.
2 Evaluating the behaviour or properties of the encompassing whole.
3 Explaining the behaviour or properties of the phenomenon or problem in terms of its roles or functions within the encompassing whole.

Systems analysis lends itself to creating understanding in complicated situations, particularly those involving people and organizations; such problems are often referred to as 'messes' because of their indeterminate nature and large number of

interconnected variables. Modelling and diagramming are two of the principal techniques used to describe systems.

In the responsive evaluation model a series of investigative steps is undertaken in order to evaluate how responsive a programme is (e.g. an advertising campaign, a new degree course or an experimental traffic scheme) to all those taking part in it. Typical steps are shown in Box 1.12.

Box 1.12 Steps in responsive evaluation

- Data collection: identifying issues from the people directly involved in the programme; identifying further issues from the programme documents; observing how the programme is actually working.
- Evaluation: the design of an evaluation based on the data collected and reporting findings.
- Suggesting changes: informing the participants of the findings in ways specifically designed for each type of audience.

A common purpose of evaluation research is to examine programmes or the working of projects from the point of view of levels of awareness, costs and benefits, cost-effectiveness, attainment of objectives and quality assurance. The results are generally used to prescribe changes to improve and develop the situation, but in some cases might be limited to descriptions giving a better understanding of the programme (Robson, 1993, pp. 170–9).

Action

This can be seen as related to experimental research, though it is carried out in the real world rather than in the context of a closed experimental system. A basic definition of this type of research is: 'a small scale intervention in the functioning of the real world and a close examination of the effects of such an intervention' (Cohen and Manion, 1994, p. 186).

Its main characteristic is that it is essentially an 'on the spot' procedure, principally designed to deal with a specific problem evident in a particular situation. No attempt is made to separate a particular feature of the problem from its context in order to study it in isolation. Constant monitoring and evaluation are carried out, and the conclusions from the findings are applied immediately, and further monitored. Action research depends mainly on observation and behavioural data. As a practical form of research, aimed at a specific problem and situation and with little or no control over independent variables, it cannot fulfil the scientific requirement for

generalizability. In this sense, despite its exploratory nature, it is the antithesis of experimental research.

Ethnogenic

In this approach, the researcher is interested in how the subjects of the research theorize about their own behaviour rather than imposing a theory from outside. The test of success is that the subjects themselves recognize the description of familiar features of their culture. As a process of studying human behaviour, according to Goetz and LeCompte (1984), the ethnogenic approach has three characteristic features: it aims to represent a view of the world as it is structured by the participants under observation by eliciting phenomenological data; it takes place in the undisturbed natural settings of the subjects; and it attempts to represent the totality of the social, cultural and economic situation, regarding the context to be equally important as the action (Uzzell, 1995, pp. 304–5).

This is a difficult form of research for several reasons. As so much of culture is hidden and rarely made explicit, the data being sought by the researcher need to be pursued by delving deep into the language and behaviour of the subjects of the study, and of the surrounding conditions in which they live. There is an ever-present danger that the cultural background and assumptions of the researcher will unduly influence the interpretations and descriptions made on the basis of the data collected. In addition to this, there can be confusions produced by the use of language and the different meanings which may be given to words by the respondents and researcher.

The accounts of events in the past can never capture the infinite contents of history. Historical knowledge, however well authenticated, is always subject to the biases and memory of its chronicler. It is also very difficult for one living in the twenty-first century to understand a world outside the framework of contemporary beliefs, values and attitudes.

Apart from these problems of interpretation of data, there is the fact that when working in a naturalistic setting, with social groups engaged in everyday activities, it is impossible to repeat the situation in order to verify the research. Social reality is not stable: a thing never 'is', as it is always changing into something else. It is therefore of great importance that multi-method and confirmatory data sources are used to capture the moment.

Feminist

Feminist research is a particular model of social research which involves theory and analysis that highlight the differences between men's and women's lives. It claims

that researchers who ignore these differences have invalid knowledge, as non-feminist paradigms usually ignore the partiality of researchers' ideas about the social world. Value neutrality is impossible as no researcher practises research outside his or her system of values and no methods of social science can guarantee that knowledge is originated independently of values.

No specific methods are seen to be particularly feminist, but the methodology used is informed by theories of gender relations. However, feminist research is undertaken with a political commitment to the identification and transformation of gender relations. This tends to reveal that this form of research is not uniquely political, but rather exposes all methods of social research to be political.

Cultural

postmodernism, post-structuralism

Many of the prevailing theoretical debates (e.g. **postmodernism**, **post-structuralism**) are concerned with the subjects of language and cultural interpretation, with the result that these issues have frequently become central to sociological studies. The need has therefore arisen for methodologies that allow analysis of cultural texts to be compared, replicated, disproved and generalized. From the late 1950s, language has been analysed from several basic viewpoints: the structural properties of language (notably Chomsky, Sacks, Schegloff), language as an action in its contextual environment (notably Wittgenstein, Austin and Searle) and sociolinguistics and the 'ethnography of speaking' (Hymes, Bernstein, Labov and many others).

However, the meaning of the term 'cultural texts' has been broadened from that of purely literary works to that of the many manifestations of cultural exchange, be they formal such as opera, TV news programmes, cocktail parties etc., or informal such as how people dress or converse. The main criterion for cultural texts is that one should be able to 'read' some meanings into the phenomena. Texts can therefore include tactile, visual and aural aspects, even smells and tastes. Three approaches to the consistent interpretation of cultural texts can be mentioned here briefly: content analysis, semiotics and discourse analysis.

order

Content analysis was developed from the mid 1900s, chiefly in America, and is a rather positivistic attempt to apply **order** to the subjective domain of cultural meaning. A quantitative approach is taken by counting the frequency of phenomena within a case in order to gauge its importance in comparison with other cases. As a simple example, in a study of racial equality one could compare the frequency of the appearance of black people in television advertisements in various European countries. Much importance is given to careful sampling and rigorous categorization and coding in order to achieve a level of objectivity, reliability and generalizability and the development of theories.

Semiotics takes an almost opposite approach by attempting to gain a deep understanding of meanings by the interpretation of single elements of text rather than to generalize through a quantitative assessment of components. The approach is derived from the linguistic studies of Saussure, in which he saw meanings being derived from their place in a system of signs. Words are only meaningful in their relationship with other words, e.g. we only know the meaning of 'horse' if we can compare it with different animals with different features.

This approach was further developed by Barthes and others to extend the analysis of linguistic-based signs to more general sign systems in any sets of objects:

> semiotics as a method focuses our attention on to the task of tracing the meanings of things back through the systems and codes through which they have meaning and make meaning. (Slater, 1995, p. 240)

Hence the meanings of a red traffic light can be seen as embedded in the system of traffic laws, colour psychology, codes of conduct and convention etc. (which could explain why in China a red traffic light means 'go'). A strong distinction is therefore made between denotation (what we perceive) and connotation (what we read into) when analysing a sign.

Discourse analysis studies the way that people communicate with each other through language within a social setting. Language is not seen as a neutral medium for transmitting information; it is bedded in our social situation and helps to create and recreate it. Language shapes our perception of the world, our attitudes and identities. While a study of communication can be simply broken down into four elements (sender, message code, receiver and channel), or alternatively into a set of signs with both syntactical (i.e. orderly or systematic) organization and semantic (i.e. meaningful and significant) relationships, such simplistic analysis does not reflect the power of discourse.

It is the triangular relationship between discourse, cognition and society that provides the focus for this form of analysis (van Dijk, 1994, p. 122). Two central themes can be identified: the interpretive context in which the discourse is set, and the rhetorical organization of the discourse. The former concentrates on analysing the social context, for example the power relations between the speakers (perhaps due to age or seniority) or the type of occasion where the discourse takes place (at a private meeting or a party). The latter investigates the style and scheme of the argument in the discourse, for example a sermon will aim to convince the listener in a very different way to a lawyer's presentation in court.

post-structuralist

Post-structuralist social theory, and particularly the work of the French theorist Michel Foucault, has been influential in the development of this analytical approach to language. According to Foucault, discourses are 'practices that systematically form the objects of which they speak' (1972, p. 43). He could thus demonstrate how discourse is used to make social regulation and control appear natural.

Thought

Space does not allow the description of other types of research. Different disciplines, such as philosophy, theology and metaphysics, have types of research which are specifically suited to their purposes, but are beyond the scope of this book. It is important to point out that the above types of research are not generally mutually exclusive in a research project. More than one of these approaches may be relevantly used in order to achieve the outcomes aimed at in the research.

The Research Process

Whichever type of research you choose, it will be useful to understand something of the process of research. This can help you to form a framework for your activities.

Figure 1.4 Sitting down to write a 30,000 to 60,000 word thesis or research report is no simple task

Sitting down to write a 30,000 to 60,000 word thesis or research report is no simple task. The research on which it is based does not develop in a linear fashion, any more than does the writing of the report itself. So how does one go about doing research? You will have undoubtedly noticed by now that the acquisition of knowledge and the questioning of what to do with it is a complex process. From the numerous books on research methods, three interpretations of how the activities of research interweave with each other have been selected, each viewing the process at a different level of detail.

A simple summary of the relationships between five main elements of the research process can be mapped (Diagram 1.1). This compact diagram stresses

Diagram 1.1 The research process

the circularity of the process and the central role of research theory. Is it clear to you how progress is achieved, and at which point you can enter the system? One should point out that this diagram makes research look a very tidy and logical process, but in reality you may find that it involves guesses, intuition and intellectual cul-de-sacs.

The spiral diagram that I have developed from the rather two-dimensional circular representation by Leedy (1989, p. 9) illustrates even more strongly the cyclical nature of the research process (Diagram 1.2). The division of the segments clearly indicates where you get on board. Notice how each turn through the spiral repeats the basic process. The knowledge gained and questions raised at each turn provide the basis for the next cycle.

- To view research this way is to invest it with a dynamic quality that is its true nature – a far cry from the conventional view, which sees research as a one-time act – static, self-contained, and an end in itself … Every researcher soon learns that genuine research creates more problems than it resolves. Such is the nature of the discovery of truth. (1989, p. 9)

The diagram developed from that of Newman (1989) concentrates on the first stages in the process. It shows a clear direction in sequence of time, and displays how the process involves successive widening and narrowing of knowledge bands (Diagram 1.3). As each level of knowledge is achieved, the subject area is

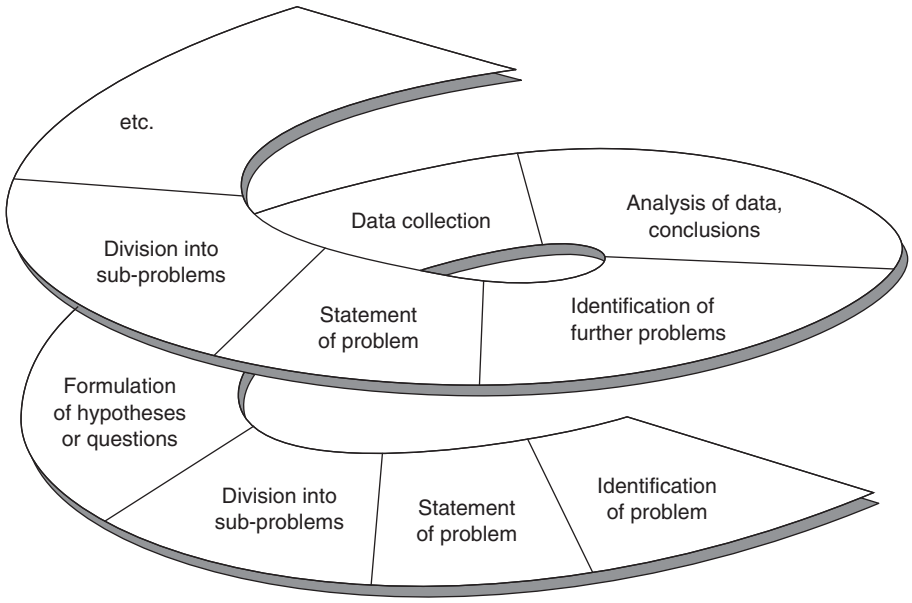

Diagram 1.2 The research process (Leedy, 1989, p. 9)

narrowed down to become more specific, followed by subsequent widening of knowledge as that specific area is researched in detail. This sequence of moving into more specific, yet more widely researched subject areas could be extended right through the project, culminating in the specifically narrow conclusions and finally widening out into recommendations which are of more general significance.

Exercise 1.1

Sketch the continuation of Diagram 1.3 using the following stages, and show what gets rejected every time the subject is narrowed down:

- definition of problem area
- research into area
- definition of research problem
- investigation into relevant concepts, theories and research methods
- research proposal
- data-gathering and analysis
- findings and conclusions
- recommendations

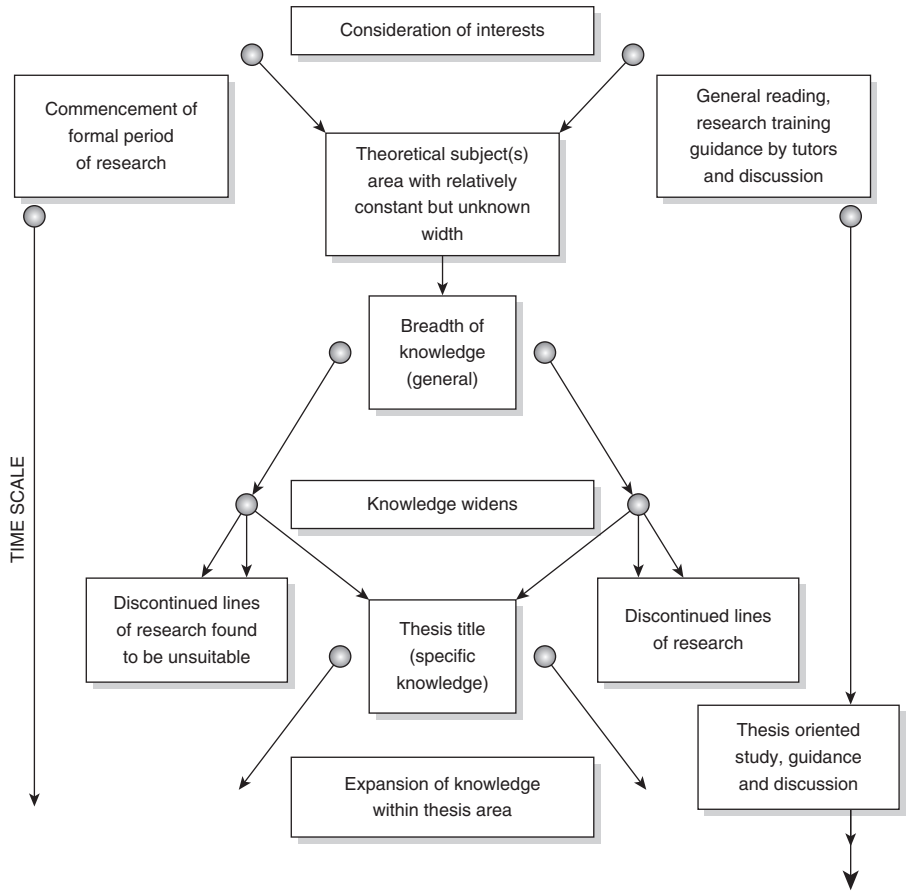

Diagram 1.3 The research process (Newman, 1989, p. 28)

An alternative way of looking at it is as a series of stages that are interrelated and are sometimes revisited in an iterative fashion during the project (see Diagram 1.4). The teaching of research methods usually relates to these stages and reflects the practical nature of the subject.

Thought

To be able to design and plan your own research project you will have to use your understanding of the process of research. The steps to take in planning the project will be explained later in this chapter.

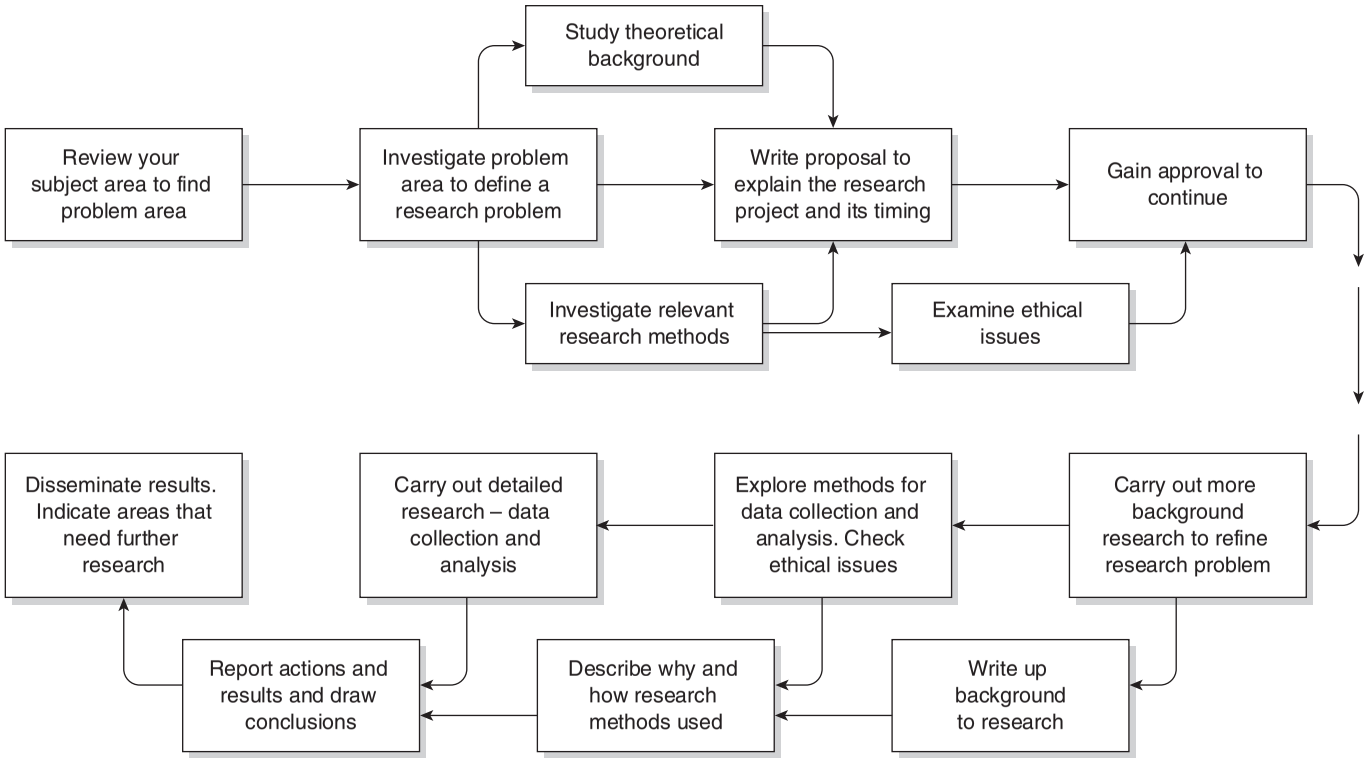

Diagram 1.4 The research process

Desirable characteristics of research findings

There is an untold mass of information in the world. By doing research, you will be adding to this plethora of information. What is it that will make your efforts worthwhile? What should the characteristics of your findings be to make your contribution valuable? Reynolds (1971) identified four desirable characteristics of scientific knowledge which we can use as a good guide and as a basis for discussion, as shown in Box 1.13.

Box 1.13 Desirable characteristics of scientific knowledge

- Abstractness
- Intersubjectivity (meaning)
- Intersubjectivity (logical rigour)
- Empirical relevance

The common thread between these is that the findings should be relevant to a wider sphere than the specific cases in your research, and that they should be based on a research process that is both accessible to and understandable by others. It is worth considering these characteristics in more detail.

abstractness

The characteristic of **abstractness** is independence from a specific time and place. Research findings are useful if they can be applied in other situations, and can lead to the development of general theories. To discover the causes of a particular phenomenon that occurred in a particular time at a particular place is of little general value if the knowledge gained is not relevant to any other phenomena at different times and in different places. There are two reasons for this.

First, no future predictions about future events can be made using this knowledge, as the phenomenon can only be seen as a unique historical event. As seen above, one of the important objectives of research is to provide predictions about the future. Resulting from this lack of predictability is the inability to affect any control over similar future events.

Secondly, by being restricted to a phenomenon in a particular place, it will be impossible to generalize from the results of this discovery to events which happen elsewhere.

There are cases where the study of a particular event is both useful and unavoidable, for instance in historical and ethnographic research. Historians are unlikely to feel competent to make predictions of future events (e.g. election results) on the basis of historical studies. The main aim of this kind of research is to analyse, explain and gain a sense of understanding. With a better understanding of a social

phenomenon, interventions to alleviate problems are likely to be more effective and have more predictable outcomes. Similarly, in investigations following an accident, the findings aim to explain events, understand their causes and invite predictions: for example, a railway signalling fault discovered in an enquiry may cause more accidents if it is not rectified.

intersubjectivity

Intersubjectivity may be understood in two senses. First, to ensure that everyone has the same understanding of words and events there must be agreement as to the meaning of concepts used in statements. This intersubjectivity of meaning, i.e. agreement between people about meaning, is attained by precise definition of concepts. Secondly, any statement describes the relationship of at least two concepts. Often, many connected statements are used in a research project to make predictions, or to explain a theory. To avoid ambiguity and disagreement about the appropriate combination of statements to use, logical systems have been evolved such as mathematics, statistics, symbolic logic etc. These are used to promote intersubjectivity, i.e. agreement about use, at a logical level.

> If scientists cannot agree on the predictions derived from combinations of statements, then there can be no agreement as to the usefulness of the statements for predicting or explaining phenomena. (Reynolds, 1971, p. 17)

empirical relevance

Most of science and all technology is based on empirical foundations, i.e. built on, or guided by, the results of observation and experimentation. The basic purpose of a scientific theory is to explain what causes an event or why one event is associated with another. The basis for these explanations is the recorded measurements made by the researcher of the events. **Empirical relevance** is a measure of the correspondence between a particular theory and what is taken to be objective empirical data, which enable other scientists to verify the results of the research for themselves. The greater the relevance of the empirical data, the more confidence can be put in the veracity of the theory.

Starting your own Research

The common element in student academic research at every level, from undergraduate to doctorate, is that they are, some more than others, exercises in the doing of research. The student will have to demonstrate knowledge of research theory and methods and the ability to apply these in an appropriate and successful manner relevant to the chosen topic. You might consider that the topic itself serves merely as a vehicle in order to make this demonstration possible. That is perhaps too cynical a view. The topic must be the driving force behind the project and, particularly at PhD level, the research must make some contribution to knowledge about

the subject. But without a proper understanding of research and its application, this knowledge will not be discovered.

But perhaps you are embarking on a research project as part of your work. Most of the issues that you will face will be similar to those faced by academic researchers. The major differences might be the greater resources available to you, the lack of access to supervision and advice, and the stresses of work in a professional context. What will be the same, however, is the requirement that the research has clear and achievable goals and is carried out efficiently using the appropriate research methods.

Finding and defining a research problem

It should be evident from what you have read so far that in order to carry out research, you need to start by identifying a question that demands an answer, or a need that requires a resolution, or a riddle that seeks a solution, which can be developed into a research problem: the heart of the research project.

Students starting their research degree course, and practitioners wishing to become involved in research, tend to come from widely different backgrounds, and are equipped with varied amounts of knowledge and degrees of experience in their chosen field of study. While most are fairly sure of the subject they want to research, many are uncertain of the exact problem they wish to address.

One of the first tasks, therefore, on the way to deciding on the detailed topic of research is to find a question, an unresolved controversy, a gap in knowledge or an unrequited need within the chosen subject. This search requires an awareness of current issues in the subject and an inquisitive and questioning mind. Although you will find that the world is teeming with questions and unresolved problems, not every one of these is a suitable subject for research. So what features should you

Figure 1.5 The world is teeming with questions and unresolved problems

look for which could lead you to a suitable research problem? Box 1.14 lists the most important.

Box 1.14 Features of a suitable research problem

1. It should be of great interest to you. You will have to spend many months investigating the problem. A lively interest in the subject will be an invaluable incentive to persevere.
2. The problem should be significant. It is not worth time and effort investigating a trivial problem or repeating work that has already been done elsewhere.
3. The problem should be delineated. Consider the time you have to complete the work, and the depth to which the problem will be addressed. You can cover a wide field only superficially, and the more you restrict the field, the more detailed the study can be. You should also consider the cost of necessary travel and other expenses.
4. You should be able to obtain the information required. You cannot carry out research if you fail to collect the relevant information needed to tackle your problem, either because you lack access to documents or other sources, and/or because you have not obtained the cooperation of individuals or organizations essential to your research.
5. You should be able to draw conclusions related to the problem. The point of asking a question is to find an answer. The problem should be one to which the research can offer some solution, or at least the elimination of some false 'solutions'.
6. You should be able to state the problem clearly and concisely. A precise, well thought out and fully articulated sentence, understandable by anyone, should normally clearly be able to explain just what the problem is.

It is not easy to decide on and define a research problem, and you will not be expected to do so immediately. The important thing, at this stage, is to know what you are looking for, and to explore your subject for suitable possibilities.

problem area

The problem can be generated either by an initiating idea, or by a perceived **problem area**. For example, investigation of 'rhythmic patterns in settlement planning' is the product of an idea that there are such things as rhythmic patterns in settlement plans, even if no one has detected them before. This kind of idea will then need to be formulated more precisely in order to develop it into a researchable problem. We are surrounded by problems connected with society, the built environment, education etc., many of which can readily be perceived. Take, for example, social problems such as poverty, crime, unsuitable housing and uncomfortable workplaces, technical problems such as design deficiencies, organizational problems

such as business failures and bureaucratic bungles, and many subjects where there may be a lack of knowledge that prevents improvements being made, for example, the influence of parents on a child's progress at school, the relationship between designers and clients. Obviously, it is not difficult to find problem areas. The difficulty lies in choosing an area that contains possible specific research problems suitable for the subject of a research project or degree.

Some common mistakes

It is worth warning you at this stage of some common mistakes made when a research problem is chosen. These mistakes arise mainly from the failure to grasp the necessity for the *interpretation* of data in the research project. Box 1.15 shows four common mistakes.

Box 1.15 Common mistakes when choosing a research problem

1. Making the choice of a problem an excuse to fill in gaps in your own knowledge. We all welcome the chance to learn more for ourselves, but the point of research is not just personal enlightenment, but making a contribution to public knowledge. Anyone can find a problem that involves the gathering and duplication of information, but it requires an additional effort to find one that requires data to be analysed and conclusions to be drawn which are of wider interest.
2. Formulating a problem that involves merely a comparison of two or more sets of data. A comparison of sets of data or records might fill up many pages (e.g. the average age of marriage through the centuries), but without any effort to reveal something new from the information, there is no research activity. The problem should clearly state the objectives behind making the comparison.
3. Setting a problem in terms of finding the degree of correlation between two sets of data. Comparing two sets of data to reveal an apparent link between them (e.g. the average age of marriage and the size of families) might be interesting, but the result is only a number, and does not reveal a causal connection. This number, or coefficient of correlation, reveals nothing about the nature of the link, and invites the question – so what?
4. Devising a problem to which the answer can be only yes or no. In order to improve on our knowledge of the world we need to know why things are as they are and how they work. A yes–no solution to a problem skirts the issues by avoiding the search for the reasons why yes or no is the answer, and the implications which the answer has.

Exercise 1.2

Consider the following short sentences claiming to be research problems and decide whether they are researchable, and are a feasible proposition for an individual student, like yourself, to undertake for a research degree or as a research project. Respond first with the answers 'yes', 'no' or 'possibly'. Then, if you think that the research problem is not viable or will present difficulties, briefly give your reasons.

1 An enquiry into the history of the building of the Channel Tunnel.
2 A study to compare the results in school history exams for 16-year-olds throughout Europe between 1970 and 1980.
3 The effects of parent unemployment on their children's attitude to schoolwork.
4 The relationship between temperature, humidity and air movement in the cooling effect of sweating on the human skin.
5 The effects of using glass of different thickness and qualities in single, double and triple glazing.
6 What factors must be evaluated and what is their relative importance, in constructing a formula for allotting grants to university students in Scotland.
7 An analysis of the influence of Palladio's villa designs on large country houses built in Britain in the eighteenth century.
8 Whether the advantages of foreign borrowing by Third World countries outweigh the disadvantages.
9 The composition of prefabricated elements of buildings in the construction of multi-storey car parks in tight urban situations in large conurbations of the United States of America during the 1970s.
10 A study of how hospital patients' recovery is affected by the colour of their surroundings and of how they react to the effects of different light levels after major operations.
11 An enquiry to identify and evaluate the causes of 'sick building syndrome' in order to indicate possible methods of avoiding the occurrence of this 'syndrome' in new buildings.
12 The impact of local tax and exaction policies on the London commercial office sector.
13 Economic implications of the programme of rental increases and housing sales in China.
14 How the career plans of school leavers compare with their subsequent careers in terms of self-satisfaction and self-adjustment, and what information the analysis of the difference between planned and realized careers provides to assist in career planning.

Thought

As you can see, it requires a good deal of thought and knowledge of your chosen topic of study in order to isolate a suitable research problem. Unless you have come to do your research with a particular detailed problem already identified (probably following on from some previous research which you have done), you will need to narrow down to a specific problem from a wider problem area.

Aids to locating and analysing problems

Booth et al. (1995, p. 36) suggest that the process for focusing on the formulation of your research problem is as shown in Box 1.16. As you can see, they recommend that, apart from simply narrowing down the object of study, you should carefully scrutinize the resultant topic in the light of what you have found out in your background studies.

Box 1.16 How to focus on a research problem

1 Find an interest in a broad subject area (problem area).
2 Narrow the interest to a plausible topic.
3 Question the topic from several points of view.
4 Define a rationale for your project.

problem area

Initially, it is useful to define no more than a **problem area**, rather than a specific research problem, within the general body of knowledge that interests you, e.g. housing and homelessness, parks in cities, building regulations and historic conservation. Your aim should be to subsequently narrow down the scope of the idea or problem until it becomes a highly specific research problem. This narrowing process will require a lot of background reading in order to discover what has been written about the subject already, what research has been carried out, where further work needs to be done and where controversial issues still remain.

You should keep in mind three questions when engaged in the preliminary exploratory work. The first is, *what is your motivation for doing the research*? A major motivation should be a curiosity about the research results. Another will undoubtedly be the fulfilment of the requirements of a research degree. Learning about the process of research – practical knowledge that can be used in the future – is also likely to be a motivation. The choice of problem is likely to be influenced by these motivational factors.

The second question is, *what relevant interest, experience or expertise do you bring to bear on the subject*? Obviously, interest in a subject is essential if you are to concentrate happily on it for a year or more. Although experience or expertise in a subject is not a prerequisite to doing research in that field, it does have an effect on the preliminary and information-gathering stage of the work, as you will be familiar with the literature and the potential problem areas. However, a 'new light' may be cast on a subject by someone looking at it with 'fresh eyes'.

The third question is, *what are you going to produce*? As a researcher, your priority will be to produce a defendable thesis or useful research report within your time limit. If you are a research student, you should check the requirements of your university or college in the regulations issued about the nature of suitable research topics. (It might be a good idea to do that now. You will find the information in the latest university research degree regulations kept in the library. You should also be issued with your own copy.) If you are doing a dissertation as part of a course, check the course notes for guidance. If you are doing a funded research project, then you will need to know the requirements of the likely funders or of the policy of the organization for which you work.

Figure 1.6 What are you going to produce?

Initial literature review and defining the problem area

The objective of the initial review of the literature is to discover relevant material published in the chosen field of study and to search for a suitable problem area.

Fox (1969) mentions two kinds of literature that should be reviewed. The first is 'conceptual literature'. This is written by authorities on the subject you have in mind, giving opinions, ideas, theories or experiences, and published in the form of

books, articles and papers. The second is 'research literature', which gives accounts and results of research that has been undertaken in the subject, often presented in the form of papers and reports. Chapter 2 in this book tells you how you can effectively carry out this search through the literature.

As every piece of research contributes only a small part to a greater body of knowledge or understanding, researchers must be aware of the context within which their research work is to be carried out. At this stage it is important to get an overview of the subject, rather than knowledge in depth. This will provide you with an understanding of the principal issues and problems or controversies, and the opportunity to select a problem area within a frame of reference. Within this problem area, it is important that you familiarize yourself with those aspects that have already been well established by previous research, and are generally accepted as true. These 'truths' can then be assumed to need no further proof, and the research problem simply uses them. It is not possible for a researcher to question absolutely everything in his/her investigations. Alternatively the research problem can be in the form of a challenge to veracity of one or more of these 'truths'. Advances in wisdom are only made by building on the solid foundations of previous knowledge. Obviously, someone who is already familiar with the subject investigated will tend to be quicker to advance through this stage.

Thought

At this early stage in your research programme you are exploring your subject field only to identify a problem area, and do not need to try to define your research problem in any detail. All the same, I think it is useful to know what the next steps will be so that you can see the direction in which you will be moving. This might well help you to choose a problem area. The knowledge and techniques you will require for defining your specific research problem in detail are explained in Chapters 2–8 of this book.

Research problem definition

From the interest in the wider issues of the chosen subject, and after the selection of a problem area, the next step is to define the problem more closely so that it becomes a specific **research problem**, with all the characteristics already discussed. This stage requires an enquiring mind, an eye for inconsistencies and inadequacies in current theory, and a measure of imagination. It is often useful in identifying a specific problem to pose a simple question, for example, 'Does the presence of indoor plants affect people's frame of mind?' or 'How can prevention measures reduce vandalism?' or 'Can planning and building regulations prevent the destruction of indigenous architecture?'

research problem

Such a question can provide a starting point for the formulation of a specific research problem, whose conclusion should aim to answer the question. At this stage, the nature of the question will give some indication of the type of research approach (or approaches) that could be appropriate. Will it be a historical study or a descriptive enquiry, an analysis of correlations or an experimental exercise, or a combination of more than one of them? Seemingly simple questions are riddled with ambiguities, which must be cleared up by careful definition. For example, in the above questions, what does 'frame of mind' mean, what sort of 'prevention measures' are envisaged, and does the question embrace all types of 'indigenous architecture' everywhere? It is likely that the problem is too broad if you can state it in less than half a dozen words. A few additional questions posed against each word can help to delineate the problem – where, who, what, which, when? Break the problem down into short sentences, not worrying at this stage about the overall length of the problem statement. It is a useful trick to put each sentence on a separate slip of paper, so that they can be put into order in different sequences. When the best logical progression from sentence to sentence is achieved, the statement can be edited into a more elegant form. (Chapter 4 deals in more detail with the techniques of problem statement.)

While developing a specific research problem, keep in mind the skills you will require to carry out the research posed by the problem. Fox (1969, p. 39) defines five types of skill which are essential: research design, instrument development, data collection, data analysis and research writing.

Designing research can be learned, in consultation with your tutor or supervisor (just wait till Chapters 5 and 6). Instrument development is, however, a highly specialized skill, so it is advisable to formulate the problem so that you can use standardized or previously developed instruments. The skills required by data collection techniques are generally readily acquired (introduced in Chapter 5), though consideration must be given to the extent of data needed. Data analysis does require specialist skills, which can be of a highly sophisticated nature (specialist help is on hand when you get that far). It will definitely be worth your while to consult your tutor or supervisor on the implications for data analysis that the research problem might have. Skills in research writing will be developed in Chapter 7, and by consultation with your tutors or supervisors over the next months (or years). Careful consideration of these points will ensure that the planned research is practicable and has a good chance of success.

The sub-problems

Most research problems are difficult, or even impossible, to solve without breaking them down into smaller problems. The short sentences devised during the problem

formulation period can give a clue to the presence of **sub-problems**. Does one aspect have to be researched before another aspect can be begun? For example, in one of the research questions asked above – the kinds of prevention measures that can be used against vandalism – how the measures can be employed and for what types of vandalism they are suitable, will have to be examined. The sub-problems should delineate the scope of the work and, taken together, should define the entire problem to be tackled as summarized in the main problem.

sub-problems

Following on from their recommended steps for narrowing down the scope of your study to one topic, as shown in Box 1.16, Booth et al. (1995, p. 40) elaborate on how you can organize your questions to define the sub-problems by looking at your topic from the four perspectives shown in Box 1.17. It is interesting to note that the usefulness of the topic is also an issue that should be taken into account – but does this exclude blue-sky research? I hope not!

Box 1.17 Questions used to define sub-problems

1 What are the parts of your topic and what larger whole is it a part of?
2 What is its history and what larger history is it a part of?
3 What kind of categories can you find in it, and to what larger categories of things does it belong?
4 What good is it? What can you use it for?

Second review of literature

A more focused review of the literature follows the formulation of the research problem. The purpose of this review is to learn about research already carried out into one or more of the aspects of the research problem, as shown in Box 1.18.

Box 1.18 Purposes of a literature review

1 To summarize the results of previous research to form a foundation on which to build your own research.
2 To collect ideas on how to gather data.
3 To investigate methods of data analysis.
4 To study instrumentation that has been used.
5 To assess the success of the various research designs of the studies already undertaken.

A full introduction to the techniques of literature review, information storage and information retrieval is given in Chapter 4.

Exercise 1.3

In order to exercise what you have learned about the characteristics of the research problem and how it should be presented, here is part of a research proposal written by a postgraduate research student. It aimed to describe accurately and succinctly the relevant background, the problem to be researched and its importance. Obviously, you are not required at this stage to write anything as detailed as this yourself. The point of this exercise is for you to examine this text to see how a research problem can be extracted out of a context and defined and described in such a way as to convince the reader that the project is both worthwhile and possible to carry out.

After reading the following short research proposal, check the report against the following criteria:

1 Is the research problem clearly stated? What is it? Write it out. If it is not clear, try to detect what it probably is and then summarize it.
2 Does the problem seem to arise naturally from the background information and questions? Summarize the main points of the argument which lead up to the problem. If you have difficulty finding the relevant background information and argument, explain where you see the gaps.
3 Are any sub-problems stated? If so, what are they? Write them out. Do they really form parts of the main problem?
4 Is the proposed research limited in scope? What are the limitations? (It will help you if you think of different aspects of the research, e.g. time, place etc.)
5 Did the researcher state what type of research approach would be used? If so, write a summary of the research activities to be undertaken.
6 Is there any indication of the importance of the study? Describe how, if at all, this is conveyed.
7 Is there any reference to, or discussion of, related literature or studies by other researchers? If so, which?

RESEARCH PROPOSAL

A Study of Group-living Accommodation for Young Physically Disabled People

The aims of this study are to investigate different forms of group-living accommodation designed for people with physical disabilities; and to evaluate their effectiveness in meeting requirements for independent living, particularly for young severely disabled people.

The ethos behind segregation of disabled people has been that those who are incapable of managing their own lives might reasonably be placed in institutions

that can take over those responsibilities. Admission into such institutions has for a long time implied, by circumstance or design, a relinquishment of certain rights, most particularly that of independent living.

As distinctions between those who are dependent on others have become more clear – the poor, sick, old and abandoned – so institutions and buildings, such as workhouses, orphanages and asylums, have evolved to provide for them. Their common ethos was segregation. After World War II, that acceptability of segregated institutions was called into question and alternatives to institutional living were sought for those dependent on others for their care. The response of the caring institutions was to shift away from segregation and towards the integration of people with disabilities into mainstream society. The underlying problem for architects was how buildings would need to change to accommodate this shift. Architects needed to devise a diversified range of buildings that widened the options for independent living for people with differing degrees of disability.

In the 1950s and 1960s new building forms such as sheltered and special needs housing were developed, but these were predominantly for the elderly. For younger disabled people there continued to be few alternatives between admission to an institution or staying at home.

However, by 1970 new concepts were developed; most striking were young disabled units (YDUs) for severely disabled people of working age who had to leave home.

Over 320 YDUs and similar buildings have been built in the last two decades, providing places for 10,500 people. Some are built in the grounds of hospitals and some in the community; they generally accommodate 30 residents with their own bedroom and shared common facilities. Their objective has been to meet requirements for independent living, across the age range of residents, from school leaving age to retirement. However, research on the effectiveness of these schemes is sparse. Investigation so far suggests that their design has been more successful at accommodating the needs of older residents and less successful at accommodating the requirements for independent living of younger disabled people.

The focus of this study will therefore be to investigate the influences on different YDU built forms, and evaluate their effectiveness in meeting the independent-living needs and aspirations of the young people with severe disabilities who live in them.

Indicators of independent living established early in the study will be used to measure the effectiveness of independent living attained in the different building types, all purpose-designed to wheelchair parameters. Data will be collected by undertaking detailed multi-method surveys of different YDU-type group-living schemes. The surveys will include detailed appraisal of plans and measurements of buildings, observation of the building in use and structured interviews with residents across the age range.

The findings of the study are intended to make an original contribution to research in this area, and provide recommendations of practical value for the design of independent-living schemes which set out to optimize the independence of young people with severe physical disabilities.

(Proposal by David Bonnett – who successfully completed his PhD three years later.)

Thought

Are you finding it quicker to analyse a given text now? The example given above is the first part of a research proposal for an MPhil with intention to transfer to a PhD. What has been left out in this example is the detailed methodology, explaining exactly how the research will be carried out. As already mentioned, you are not expected to be able to write anything as detailed as that at this stage. However, after Chapter 7, you should be able to write something comparable and this extract gives you some idea of what you are aiming at. Of course, your subject may be completely different, but the criteria listed above will be the same.

Planning a Research Project

The purpose of the research plan is to take the initial research problem and decide how it will be researched. A clearly defined and expressed research problem is one important prerequisite for evolving a research plan. Important facts to be considered when designing the project are: available time, financial resources, facilities, availability of data, possible methods of analysis, and your own developing skills as a researcher.

Remember that you do not have a team of researchers to support you, and that you have only a few weeks to complete a dissertation, about one year to complete an MPhil or about three years to complete a PhD. All other research projects are similarly limited in their time-frame. There will be some hard choices to make; however fascinating your subject and however important the expected outcomes, it is essential to limit the area of your investigation and keep it within manageable proportions. Keep in mind that working towards a research degree is also a training exercise to develop research skills, and your thesis will finally demonstrate that you have acquired them sufficiently.

Choosing a research strategy

What sort of research will you pursue? It is worth remembering the different overall aims that could be at the centre of your project. Phillips and Pugh (1994, pp. 49–52)

identified three basic aims of research, as shown in Box 1.19 and discussed in the text that follows.

Box 1.19 Basic aims of research

- Exploration
- Testing out
- Problem-solving

Exploration

This kind of research delves into the unknown, tackling new problem issues or topics. As little or no previous research has been done on those topics, it will be impossible to delineate precisely the scope of the research or to predict its outcomes. Because it will be in a relatively unexplored domain, a necessary part of the research is to explore what existing theories, concepts and methodologies might be used or adapted, or failing those, to devise new ones. It pushes out the boundaries of knowledge in the anticipation that the outcomes will be of value.

Testing out

A common feature of such research is that it makes generalizations from specific instances. But how far are the generalizations valid? Testing out research explores the validity of the generalizations in other circumstances, and tries to define their limits. This basic scientific activity leads to the refinement of theories. There are a host of opportunities in this approach: testing the generalizations in different locations, under different social or physical conditions, in different contexts etc.

Problem-solving

This type of research identifies a 'real-life problem'. Its aim is to find possible solutions to the problem by using techniques of systematic appraisal and analysis. As 'real-life problems' tend to be complex, the study might involve several disciplines and a variety of methods, requiring a great deal of background knowledge. Although it is possible to pursue this kind of research on a theoretical level, commonly practical benefits flow from it. However, solutions are unlikely to be obvious and clear-cut.

Which type of research lends itself best to gaining a research degree? Phillips and Pugh (1994) pragmatically suggest that the safest option is to be recommended, that is, the one with the fewest unknown factors. Testing out research, based on

Figure 1.7 Problem-solving type of research identifies a 'real-life problem'

known theories and established methods of testing, avoids the unpredictability (though it might miss out on the excitement) of the other two research approaches. It is probably better to keep your feet on the bottom until you are able to swim! You will still have to introduce some new insights or methods into the subject to make the research worthwhile (rather than just replication), and it can be argued that this mainstream type of research will usefully produce more readily publishable and quotable results than the other two types.

There are greater risks and unknowns in the exploratory and problem-solving approaches. They undoubtedly require more expertise and experience on the part of the researcher and demand the enthusiastic support of the supervisor. In such innovative and original research, it is more difficult to achieve the authority in the subject required for it to be publishable, which might, in turn, impede a career in research.

Thought You should now think about your own research interest and reflect on which of the above types of research might be considered to be appropriate for your own work.

Planning your projects

Any research project requires planning so that the researcher's time is used efficiently in pursuance of the research objectives. Much effort can be wasted and frustration incurred by haphazard reading and collecting of notes and references,

sundry information and opinions. This form of activity might be 'very interesting', but leads in no particular direction and hence does nothing to advance the progress of the research.

> Research planning and architectural planning have much in common. Each requires a conceptualisation of the overall organisation and a detail plan before work on the project can begin. For successful completion, a building requires plans that are clearly conceived and accurately drawn. A research project should be no less totally visualised and precisely detailed. (Leedy, 1989, p. 79)

According to Leedy (1989, p. 81), all research has a basic format. Whatever subjects or disciplines are its focus, they all share the need of a central research problem, a search for and collation of data, appropriate methods of analysis and the formulation of substantiated conclusions. This is not to say that the methodology will be similar in all disciplines. On the contrary, much of the planning of research projects is taken up with deciding on the most appropriate techniques for data collection and analysis. The underlying dynamics of the process also include the features of the researcher, such as motivation, experience and skills; aspects of the research situation, such as cost, time, facilities, situation etc.; and the needs and demands of the respondents or others co-operating in the research.

Boxes 1.20, 1.21 and 1.22 give three examples of research plans, two for PhD theses and the third for a funded research programme. Note that references in these plans are not included in the reference list for this book.

Box 1.20 Example research plan 1

Oxford City Primary Care Group: A Case Study of Interagency Collaboration

Promoting independence in older people

For this part of the study, fracture of the neck of the femur (hip fracture) will be used as a tracer condition. Care provision for this group potentially involves the whole system of health and social care, including prevention (accident reduction), trauma, rehabilitation, primary care, continuing community care, social services, the voluntary sector, carers, day centres, residential care etc. If the PCG is to have an impact on interagency collaboration, it should be apparent in the treatment of this care group.

The study will seek to identify the impact of the PCG on interagency collaboration from the perspectives both of those at management level and of service users. Semi-structured interviews will be conducted with a purposive sample of

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representatives at middle management and operational levels of the agencies involved. A SWOT (strengths, weaknesses, opportunities and threats) framework will be used. A sampling frame is being composed by asking senior people in relevant agencies to identify who in their organization would be the most appropriate person to interview in terms of their proximity to interfaces with other agencies. These will be followed by semi-structured interviews to explore the experiences of people who have returned home following a hip fracture and the experiences of their carers. This will provide contextual data to corroborate (or not) the accounts of the 'professionals'. The methodological approach is to investigate the perceptions of professionals and users, including comparing expectations with actuality one year on, rather than measuring impacts directly. Service users and their carers will be accessed through the A&E department at the John Radcliffe Hospital. Medical Ethics Board approval will be sought. Fieldwork will be carried out at two time points: at time 1 (April–June 2000) and at time 2 (April–June 2001).

Evaluation of the PCG's Substance Misuse Services

This project is a PCG initiative that addresses one of its five stated priorities: tackling the city's drug and alcohol problems. The PCG has put in post a Development Officer, Oxford Community Substance Misuse Services, for a year from January 2000 with a budget of £100,000 to develop the initiative. The criteria measured in the present study will be largely the objectives of the initiative, and will therefore be specified in consultation with its steering group.

As with the previous part of the study, semi-structured interviews with a purposive sample of key informers at management and practitioner levels of the relevant agencies will be conducted. A SWOT framework will be used. Service users will also be interviewed to assess the impact of the PCG initiative on their experiences of care. They will be accessed through the street drug agency, Libra. Using the agency's director as a 'gatekeeper', clients will be invited to take part in the study on a voluntary basis. The approval of the Medical Ethics Board will be required. Fieldwork will be carried out at two time points: at time 1 (April–June 2000) and at time 2 (April–June 2001).

Monitoring structural change

The third element of the study will investigate the PCG's impact on partnership working and monitor structural change in the PCG in three ways: through interviews, postal surveys and document analysis. Preliminary analysis of the interviews will inform the construction of two postal questionnaires. Comparisons will be made with the findings of the National Tracking Project which is carrying out a national survey of a 15% sample of PCGs, part of which will be looking particularly at the

development of partnerships with local authorities. A theme of particular interest will be the impact of the introduction of the PCG on former fundholding GPs.

1 Interviews. Each 6 months (June and November) interviews will be carried out with key informers at the interfaces between agencies. A SWOT framework and/or Stephen Peckham's (1999) separation–integration interview schedule will be used. Interviewees representing constituents of as many agencies as possible will be interviewed.
2 Postal questionnaires. The first questionnaire will be sent only to ex-fundholders, and will aim to establish the prevalence of the experiences expressed in the interviews with fundholders. The design of the second questionnaire will be informed by the preliminary analysis of all the interviews, and will be sent to each practice in Oxford. Support from the PCG will be provided to encourage the return of questionnaires.
3 Document analysis. Ongoing analysis of PCG documents will be carried out. These documents will include the agendas and minutes of board meetings, subgroup meetings (Health Improvement Plan Group, Communications and Public Involvement Group, Mental Health Working Group, Clinical Governance) and other meetings, consultation exercises etc.

The collection of baseline data during the first round of fieldwork will constitute the MPhil stage of the study, while the PhD stage will comprise the collection of data a year on and the analysis of how the PCG has impacted on interagency collaboration during its first period of activity.

(Alison Chisholm, Oxford Brookes University)

Box 1.21 Example research plan 2

Factors Affecting the Teaching and Learning of Energy in Science at Key Stage 3

Proposed plan

Stage 1: Survey to find out about approaches to teaching energy at KS3. The focus will be curriculum organization, resources used and teachers' subject specialization. This will be done initially with a semi-structured questionnaire aimed at heads of science. It is hoped to quickly follow this up with a short informal interview asking about opinions of the teaching of energy and the possibility for further research with science teachers in the schools. It is aimed initially to contact a random sample

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of 100 secondary schools from a selection of rural and urban settings over several shire counties and metropolitan districts. This stage will be done as an initial contacting exercise and ice-breaker which will accumulate a useful base of information on how energy is taught in schools. A semi-structured questionnaire is appropriate as the information asked for is fairly superficial and organizational and not of an emotive, sensitive nature. Existing contacts in the School of Education will be used initially. Data will be analysed using a spreadsheet, e.g. Excel.

Stage 2: Upon securing contact with some volunteer teachers, this stage will be a short exercise with the aim of working with teachers to elicit and prioritize factors they feel important, in their experience, in effecting conceptual understanding. Elicitation will be done through a concept mapping exercise. Ranking and prioritizing will be done through a response scale to gauge actual perceived importance, triangulated with a prioritizing grid to gauge relative importance. This stage will be done to gain a slightly deeper insight into teaching practice within the curriculum framework established in stage 1; to further working relationships with schools; and to get to know teachers and open up the possibility for in-depth case study work, thus providing a start for an action-research-based methodology by encouraging reflection in teachers and the researcher. It is aimed to work with twenty teachers. Data will be analysed with a spreadsheet by triangulating ranked and prioritized factors. The resulting individual 'picture' of factors important to each teacher is intended to provide useful material for reflection on conceptual understanding. 'Pictures' for all the teachers as a group may be examined for evidence of correlation. It is intended to pilot this stage with a group of PGCE students in order to refine the method of concept mapping and facilitate reflection and also gain 35 further useful contacts.

Stage 3: Case studies working with eight to ten teachers and their pupils. The aim will be to assess the effectiveness of teaching energy under particular sets of identified and reflected-upon grounded factors, as elicited, ranked and prioritized in stage 2. This will be done by working with teachers and their pupils from year 7, 8 or 9 classes, closely following a sequence of lessons on energy, or an energy related topic. Effectiveness will be assessed from the point of pupils' a priori and a posteriori conceptual understandings. This will be done by first negotiating a set of criteria for pupils' expected outcomes for the sequence of lessons. These will contain elements of the school's scheme of work and hence National Curriculum references. Also, the expected level of understanding of the energy concept will be clearly predefined, such as in the model provided. However, it is anticipated that, given the complex nature of the energy concept coupled with the recent shift in its description, some teachers may need to challenge their existing ideas about energy before the teaching sequence begins. Hence it would be favourable to interview teachers in-depth to elicit any misconceptions and provide means for INSET (using methods and materials from the PSTS project). Pupils will be tested on their understandings of energy

before and after the lessons using structured and open-ended questions. A sample will be interviewed in-depth to elicit richer meanings for their conceptions. Answers to test questions and interview transcripts will be coded according to various descriptions of the energy concept. Overall, factors to be reflected on and critically examined may include curriculum organization, teachers' subject specialization and subject knowledge, effectiveness of constructivist teaching and learning, and recognition of the shift in the description of the energy concept in school science.

In summary, the sequence for each case study, after securing contact through stage 2, may include:

- interview the teacher on their understanding of energy using the 'interviews about instances and events' techniques
- test pupils and interview a sample on their preconceptions of energy
- provide opportunity for INSET (if necessary) to the teacher on the energy concept
- reflect on and redesign elements of the teaching sequence taking account of the above (constructivist principle)
- participant observation of sequence of lessons, taking field notes, coding for reporting, reflecting
- test pupils at the end, reinterview a sample
- dissemination, reflection on whole process
- possibly retest pupils at a later date to test for consolidation of conceptual understanding (constructivist principle).

Methodology

It is this researcher's position that this broad and mixed methodology is appropriate in addressing the aims set out for this study. A mixture of qualitative and quantitative methods will be used. Stages 1 and 2 are felt to be necessary prerequisites for stage 3, not only in the information they will yield but, importantly, in the personal realm. The whole design has Kelly's personal construct theory in mind, in particular the 'subsuming of personal construing systems' and sensitivity to 'core constructs'. On initial contact with schools, the aim is to ask only superficial questions about curriculum organization. Then, only when sufficient rapport and trust have been built up with teachers, will it be considered appropriate to probe with deeper questions. For example, the issue of teachers' subject knowledge may arise in stage 3 which, as mentioned, may be a sensitive area for secondary school science teachers. This is especially so when considering the position of a university researcher, not in the current position of teaching, coming in to work with teachers to critically examine practice.

Stage 3 has been designed on action research and constructivist principles. This researcher feels that AR is a good methodology for such in-depth educational

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research because of practitioner involvement and empowerment in the research process, the grounded nature of the knowledge and the practical value of the research generated. Also, because of the self-reflective process, it encourages the potential for a positive change in practice. Constructivism is felt to be an appropriate pedagogy on grounds of its weighting in current literature, as reported.

View to a PhD

It is intended that this study will contribute to the knowledge base of improving the teaching and learning of the energy concept in science at KS3: in particular, by highlighting, critically assessing and reporting on factors crystallized from the research process that are believed to be important in effecting the conceptual understanding of energy. This study will also demonstrate a mixed methodology, drawing on Kelly's theory of personal constructs, action research, constructivism, and qualitative and quantitative methods. This may have the potential for extension into KS4, FE or other subject areas where conceptual understanding is an issue.

Time-frame for study

Year 1	Term 1	literature survey
	Term 2	design study, fine detail
	Term 3	contacting, stage 1, pilot stage 2, PGCE students
Year 2	Term 1	main study
	Term 2	main study
	Term 3	stages 1, 2 and 3
Year 3	Term 1	stages 1, 2 and 3
	Term 2	write up
	Term 3	write up

(Robert Illes, Oxford Brookes University)

Box 1.22 Example research plan 3

Initial Study for the Production of a Database of Current and Completed Research in Facilities Management for the Use of Managers, Designers and Researchers Working in NHS Estates

Objectives and methodology

1 Determination of necessary range and scope of the database subjects, present search methods, preferences and requirements. Method: structured personal

and telephone interviews with a small selection (approximately twenty) of managers working in relevant fields on NHS projects. Result: formulation of database 'brief'.

2 Exploration of existing data sources which are being and can be used to locate the research. Method: library searches, telephone and written enquiries to professional and research centres. Result: list of existing databases and sources of research activity information.

3 Investigation of nature of access to these data sources, costs of access, copyright situation with regard to use of data, likely copyright costs. Method: written and telephonic communication with producers and managers of data sources. Result: detailed information of availability and costs of collection of data on research activities.

4 Enquiry into suitable vehicles for the database, e.g. CD-ROM, Internet, intranet etc., including review of search engines to enable easy access to database by NHS staff and others working on NHS projects, including estimation of cost implications. Method: sourcing of specialist literature on the subject, consultation with practitioners in the field. Result: list of options with considered advantages/disadvantages and relative estimated costs.

5 Survey of suitable database computer programs, including design features, formats, search methods, print options, updating characteristics and likely costs. Method: collection of available program specifications, scrutiny of program reviews in computer press, consultations with database designers and managers in university and professional fields. Result: draft report on comparative features, suitability and costs of available programs.

6 Review of possible methods of management, maintenance, quality control and periodical updating of database, ownership and licensing options, and relative costs. Method: estimation of requirements depending on system, then consultations with NHS Estates strategic managers on funding and staffing options within the NHS organization and/or use of outside consultants. Indicative cost quotations from consultants. Result: list of possible options and costs with discussion of implications.

7 Production of draft discussion paper together with feedback questionnaire seeking informed opinion from executives and managers. Submission to NHS Estates executive and peer review. Method: preparation of paper containing collation of information gained in stages 1–6, together with a list of options and reasoned recommendations made on the basis of the available information, expert and managerial views recorded during consultations, policy and viability judgements by NHS Estates executives. Questionnaire formulation on the basis of options suggested. Also, recommendations on dissemination of discussion paper. Circulation to selected NHS managers and peer researchers

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for comments. Corrections and adjustments to discussion paper as a result of review. Result: an approved discussion paper ready for dissemination.

8 Production and dissemination of discussion paper with attached questionnaire. Method: copying and postal dissemination. Result: facilities managers in the NHS informed of options and asked for opinions.

9 Evaluation of questionnaire responses. Method: simple statistical evaluation of questionnaire returns (using SPSS) to analyse and summarize responses to options and recommendations. Summarization of any additional suggestions and comments obtained. Result: summary of feedback from profession.

10 Production of report with recommendations and possibly a proposal based on this for the production and management of a research database. Method: writing of report based on discussion paper and responses to it. Result: a well-informed report aimed at policy and decision makers in NHS Estates on the options, likely costs and acceptability of a database of current and completed research in facilities and estate management. This could form the basis for a proposal for the production and maintenance of such a database.

Project milestones

The plan of work will be carried out in three stages:

1 Formulation of design 'brief' for database and collection and assessment of information (eight weeks).
2 Writing of discussion paper and consultation (five weeks).
3 Analysis of questionnaire returns and production of report with recommendations (six weeks).

The detailed tasks are scheduled in the project plan (not shown here). The milestones for reporting results are: end of collection and assessment of information (25 January 1999), dissemination of discussion paper draft (15 February 1999) and submission of the final report (29 March 1999).

The information-gathering, consultations and evaluations will be carried out by Nicholas Walliman with the occasional assistance (advice) of other members of the team. A casual clerical assistant will be employed sporadically at appropriate times to help in the organization of the data and writing up.

Methods for disseminating and implementing research to the NHS

A discussion paper will be produced which sets out an evaluation of the advantages, options and costs of setting up and maintaining a research database. This will be disseminated to all relevant managers and executives within the Health Service. The paper will include a feedback questionnaire which, when returned, will

be evaluated, and a report will be published which makes specific recommendations. This report will be sent to policy and decision makers in NHS Estates and to all the managers and executives on the previous list.

If the recommendations support the creation of a research database or some alternative to it, these will form the basis of a proposal for the next stages in the production of a system for improving access to the latest research information relevant to facilities management in the NHS, which will be submitted to the appropriate department of the NHS Estates Agency.

(Nicholas Walliman, Oxford Brookes University)

Phillips and Pugh (1994, p. 52) maintained that doing research is a craft skill, in which the basic educational process is that of learning by doing. After you have decided on an overall plan for your project and on your research approach, you should carefully consider how you can acquire the skills required to carry out each of the 'craft' elements. This takes time, and should be included as an element in each phase of the work. You should also consider that some practice is required before you use the skill in your project, giving you the opportunity to gain some feedback and giving you greater confidence when you use it 'for serious'.

Exercise 1.4

Think about your own research topic, and the skills you will need to develop to carry it out. Then:

1. Analyse the examples of plans of work in Boxes 1.20, 1.21 and 1.22 to detect the steps taken to achieve the research aims. Compare the types of approach, and consider what you can learn from them related to your own project. Obviously the subject will be different, but you will see how the main stages of data collection, analysis and making conclusions are a common feature.
2. Make a list of the likely skills that you will need to learn and practise before you can carry out the various stages in your research plan.

The Next Steps: Finding your Research Problem Area

The aims of this section are:

- to review the contents of this chapter in relation to your intended research
- to explore your own subject for problem areas

- to assess the practicality and suitability of possible research into those areas, in order to narrow down your choice and define a research problem
- to decide what further information you require
- to consult and discuss your ideas with others.

CHECKLIST OF ACTIVITIES THAT WILL PROGRESS YOUR RESEARCH

Step 1: Use your assets to identify problem areas

Your own academic, professional and personal experiences are valuable assets in your research. Make sure you make the best of them. On the basis of what you already know about your subject, and your understanding of the nature of research, examine your field of interest and identify two or three problem areas that might be researchable. Problem areas might be found by detecting systems or organizations that do not seem to perform satisfactorily, either theoretically or practically. Larger-scale issues, for example energy conservation related to the environment, might interest you. Have you read of any widely held beliefs in your subject which you think are misleading or quite wrong, or is there a significant lack of information about a topic you consider to be of importance?

When you have selected the problem areas, explore the issues involved by devising a number of questions that highlight the nature of the problem or reveal different aspects of it. This will help to lead you to more specific research problems that could be the basis of your own research project.

Step 2: Be alert

Keep your eyes and ears open for interesting research topics. At the end of virtually all research papers and reports, and even books, there is a section that outlines the need for further research, often quite precisely defined. These could provide you with a good lead to your own research problem.

Step 3: Choose a research problem

Consider what further information you might need to obtain to clarify and delineate the problem areas. Do not try to be too specific at first. It is a good idea to make a list of your key interests in your subject, so that you can look at problems that contain some or all of your interests.

Choosing a research problem to tackle for your project is a crucial step that will affect your life for months or even years. Make sure that you are sufficiently fascinated in the issues to motivate you through to the end. Keep the project manageable, however interesting and

important the subject is. Do this by limiting it to aspects within your own expertise. Leave the other specialist areas for further research by others.

As a guide to your investigations you may find it useful to answer the following questions in each of your research problems:

1 Has anyone else done research into the same or similar problems?
2 Can you imagine how a methodical and scientific approach could be adopted to research into these particular problems?
3 What issues would need to be explored?
4 How important do you think that research into these problems is?
5 Do you think it might be possible to narrow them down (delineate them) so as to make them a practical subject for your thesis? If so, can you suggest some simple examples?

Step 4: Break down the problem

In order to see what might be involved in tackling a research problem, break down the problem into practical components, i.e. sub-problems or sub-questions. Work out what you will actually need to do to answer these. Can you manage to do it in the time allotted? If not, narrow the scope of the problem.

Step 5: Choose your research strategy

The three types of research strategy – exploration, testing out and problem-solving – are related to the research objectives listed in step 1. Where does your research fit into these? A strategy is a plan. Relate this also to your mapping out of your individual research process, and perhaps add a time and place element to get a framework of what you will actually do. The next chapter will explain in more detail the methods that you can use to carry out this strategy.

Step 6: Map your journey

From your understanding of the research process, can you map out a network or a chart that will describe your own journey through the process? The examples given are very general; you can make yours more specific to your project. Look out for two essential aspects: the characteristic broadening and narrowing of the subject area as you distil your research down to the essential elements; and the presence of reiterative feedback loops – periodic checking back to theory and evidence.

Step 7: Consult

Consult as many relevant people as possible to discuss your ideas – tutors, experts, fellow students. Mere verbal discussion about ideas is difficult to pin down. In order to communicate your latest ideas as clearly as possible, write them down. This gives the people you

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consult something concrete to comment on. Keep developing your ideas by redrafting your proposals in response to your discussions.

Step 8: Discuss

Prepare a set of notes so that you can discuss these issues with your tutor or supervisor; it is best to give it to him/her to read before your discussion. This is an exploratory exercise, so do not try to formulate your detailed research problem at this stage. This will come later. Having studied this chapter of the book, at least you will know what sort of problems you are looking for!

Consolidation and assessment

Following the above steps should lead to the identification of promising problems and to a preliminary analysis of the issues involved in each. This will help you to define the type of background information you need to explore and to delineate what issues might be of importance in narrowing down and clarifying a researchable problem to use as a basis for your research.

When you are prepared, you should arrange a tutorial with your tutor or supervisor and hand over your notes for him/her to read. Your tutor or supervisor should discuss with you the potential for research in your suggested problem areas and selection of possible research problems, and will also suggest what you need to do next in your background investigations. You will now be able to demonstrate an understanding of the basic characteristics of academic research, and you may want to discuss with your tutor some of the issues about research raised in this chapter.

FURTHER READING

A good place to start is to look at previously completed theses, dissertations, papers or research reports in your subject. This will not provide you with instructions on how to proceed, but will give you plenty of food for thought, and help to stimulate your own critical faculties about the content and quality of the work presented. This will be important when it comes to reviewing your own work later on.

Most books on this subject cover the whole sequence of preparing and writing dissertations, theses, reports etc., but hardly any actually discuss why you should

do research, and what the examiners and other readers will be looking for. Despite this it is interesting, if you have time, to compare the advice given at this stage of the process. The approaches vary, depending on the level of research, and in some, the specific subject area catered for. Only look at the preliminary advice given in the first sections of the books and scan the contents page to see if there is anything else of interest further on.

The following books are aimed at undergraduate, postgraduate and practitioner research and selective reading of the preliminary chapters will provide further guidance on research basics. Each gives a slightly different view of the issues, so refer to as many as possible. You can probably do this in the library without even taking the books out on loan. When you locate them on the shelves, look at the contents list of promising books for relevant chapters.

Blaxter, L., Hughes, C. and Tight, M. (2006) *How to Research*, 3rd edn. Buckingham: Open University Press.
The first chapter gives an entertaining review of what research is about.

Rudestam, K. E. and Newton, R. (2007) *Surviving Your Dissertation: a Comprehensive Guide to Content and Process*, 3rd edn. Thousand Oaks, CA: Sage.
Again, the first couple of chapters provide an introduction to research.

David, M. and Sutton, C. (2004) *Social Research: the Basics*. London: Sage.
A good chapter on Getting Started.

Swetnam, D. (2000) *Writing Your Dissertation: How to Plan, Prepare and Present Successful Work,* 3rd edn. Oxford: How To Books.
Chapter 1 gives some simple advice on how to get started.

Biggam, J. (2008) *Succeeding with your Master's Dissertation: a Step-by-Step Handbook*. Basingstoke: Palgrave.
A useful, simple and easy to read book for anyone who has not done a dissertation before.

And some books with a more subject-oriented approach:

Bell, J. (1990) *Doing Your Research Project: a Guide for First-time Researchers in Education,* 3rd edn. Buckingham: Open University Press.
Wilson, E. B. (1990) *An Introduction to Scientific Research*. New York: Constable.
Polgar, S. T. (2008) *Introduction to Research in the Health Sciences*, 5th edn. Edinburgh: Churchill Livingstone.
Pennings, P. (1999) *Doing Research in Political Science: An Introduction to Comparative Methods.* London: Sage.
Cooper, D. and Schindler, P. (2006) *Business Research Methods*, 9th edn. Singapore: McGraw-Hill.