

3 **Research design issues: planning research**

Introduction

There is no single blueprint for planning research. Research design is governed by the notion of 'fitness for purpose'. The purposes of the research determine the methodology and design of the research. For example, if the purpose of the research is to map the field, or to make generalizable comments then a survey approach might be desirable, using some form of stratified sample; if the effects of a specific intervention are to be evaluated then maybe an experimental or action research model is appropriate; if an in-depth study of a particular situation or group is important then an ethnographic model might be more appropriate.

That said, it is possible, nevertheless, to identify a set of issues that researchers need to address, regardless of the specifics of their research. It is this set of issues that this chapter addresses. It acts as a bridge between the theoretical discussions of the opening chapter and the subsequent chapters that cover: (a) specific styles of research (Part Three); (b) specific issues in planning a research design, e.g. sampling, validity, reliability, ethics (Part Two); (c) planning data collection (instrumentation, Part Four); (d) data analysis. The intention here is to provide a set of issues that need to be addressed in practice so that an area of research interest can become practicable, feasible and capable of being undertaken. This chapter indicates how research might be operationalized, i.e. how a general set of research aims and purposes can be translated into a practical, researchable topic.

To change the 'rules of the game' in mid-stream once the research has commenced is a sure recipe for problems. The terms of the

research and the mechanism of its operation must be ironed out in advance if it is to be credible, legitimate and practicable. Once they have been decided upon the researcher is in a very positive position to undertake the research. The setting up of the research is a balancing act, for it requires the harmonizing of *planned possibilities* with *workable, coherent practice*, i.e. the resolution of the difference between idealism and reality, between what could be done and what will actually work, for at the end of the day research has to work. In planning research there are two phases – a divergent phase and a convergent phase. The divergent phase will open up a range of possible options facing the researcher, whilst the convergent phase will sift through these possibilities, see which ones are desirable, which ones are compatible with each other, which ones will actually work in the situation, and move towards an action plan that can realistically operate. This can be approached through the establishment of a framework of planning issues.

A framework for planning research

Though, clearly, the set of issues that constitute a framework for planning research will need to be interpreted differently for different styles of research, nevertheless, it is useful to indicate what those issues might be. These include:

- 1 the general aims and purposes of the research;
- 2 how to operationalize research aims and purposes;

- 3 generating research questions;
- 4 identifying and setting in order the priorities for and constraints on the research;
- 5 approaching the research design;
- 6 focusing the research;
- 7 research methodology;
- 8 ethical issues;
- 9 audiences of the research;
- 10 instrumentation;
- 11 sampling;
- 12 time frames;
- 13 resources required;
- 14 validity and reliability;
- 15 data analysis;
- 16 verifying and validating the data;
- 17 reporting and writing up the research.

These can be arranged into four main areas (Morrison, 1993):

- (i) orienting decisions;
- (ii) research design and methodology;
- (iii) data analysis;
- (iv) presenting and reporting the results.

Orienting decisions are those decisions which will set the boundaries or the parameters of constraints on the research. For example, let us say that the overriding feature of the research is that it has to be completed within six months; this will exert an effect on the enterprise. On the one hand it will 'focus the mind', really requiring priorities to be settled and data to be provided in a relatively short time. On the other hand this may reduce the variety of possibilities available to the researcher. Hence questions of time scale will affect:

- the research questions which might be answered feasibly and fairly (for example, some research questions might require a long data collection period);
- the number of data collection instruments used (for example, there might be only enough time for a few instruments to be used);
- the sources (people) to whom the researcher might go (for example, there might only be enough time to interview a handful of people);

- the number of foci which can be covered in the time (for example, for some foci it will take a long time to gather relevant data);
- the size and nature of the reporting (there might only be time to produce one interim report).

By clarifying the time scale a valuable note of realism is injected into the research, which enables questions of practicability to be answered.

Let us take another example. Suppose the overriding feature of the research is that the costs in terms of time, people and materials for carrying it out are to be negligible. This, too, will exert an effect on the research. On the one hand it will inject a sense of realism into proposals, identifying what is and what is not manageable. On the other it will reduce, again, the variety of possibilities which are available to the researcher. Questions of cost will affect:

- the research questions which might be feasibly and fairly answered (for example, some research questions might require: (a) interviewing which is costly in time both to administer and transcribe; (b) expensive commercially produced data collection instruments, e.g. tests, and costly computer services, which may include purchasing software for example);
- the number of data collection instruments used (for example, some data collection instruments, e.g. postal questionnaires, are costly for reprographics and postage);
- the people, to whom the researcher might go (for example, if teachers are to be released from teaching in order to interviewed then cover for their teaching may need to be found);
- the number of foci which can be covered in the time (for example, in uncovering relevant data, some foci might be costly in researcher's time);
- the size and nature of the reporting (for example, the number of written reports produced, the costs of convening meetings).

Certain time scales permit certain types of research, e.g. a short time scale permits answers to short-term issues, whilst long-term or large questions might require a long-term data collection period to cover a range of foci. Costs in terms of time, resources and people might affect the choice of data collection instruments. Time and cost will require the researcher to determine, for example, what will be the minimum representative sample of teachers or students in a school, for interviews are time-consuming and questionnaires are expensive to produce. These are only two examples of the real constraints on the research which must be addressed. Planning the research early on will enable the researcher to identify the boundaries within which the research must operate and what the constraints are on it.

With these preliminary comments, let us turn to the four main areas of the framework for planning research.

Orienting decisions

Decisions in this field are strategic; they set the general nature of the research, and the questions that researchers may need to consider are:

- Who wants the research?
- Who will receive the research/who is it for?
- Who are the possible/likely audiences of the research?
- What powers do the recipients of the research have?
- What are the general aims and purposes of the research?
- What are the main priorities for and constraints on the research?
- What are the time scales and time frames of the research?
- Who will own the research?
- At what point will the ownership of the research pass from the participants to the researcher and from the researcher to the recipients of the research?
- Who owns the data?

What ethical issues are to be faced in undertaking the research?

What resources (e.g. physical, material, temporal, human, administrative) are required for the research?

It can be seen that decisions here establish some key parameters of the research, including some political decisions (for example, on ownership and on the power of the recipients to take action on the basis of the research). At this stage the overall feasibility of the research will be addressed.

Research design and methodology

If the preceding orienting decisions are strategic then decisions in this field are tactical; they establish the practicalities of the research, assuming that, generally, it is feasible (i.e. that the orienting decisions have been taken). Decisions here include addressing such questions as:

- What are the specific purposes of the research?
- How are the general research purposes and aims operationalized into specific research questions?
- What are the specific research questions?
- What needs to be the focus of the research in order to answer the research questions?
- What is the main methodology of the research (e.g. a quantitative survey, qualitative research, an ethnographic study, an experiment, a case study, a piece of action research etc.)?
- How will validity and reliability be addressed?
- What kinds of data are required?
- From whom will data be acquired (i.e. sampling)?
- Where else will data be available (e.g. documentary sources)?
- How will the data be gathered (i.e. instrumentation)?
- Who will undertake the research?

The process of *operationalization* is critical for effective research. What is required here is translating a very general research aim or purpose into specific, concrete questions to which specific, concrete answers can be given. The process moves from the general to the particular, from the abstract to the concrete. Thus the researcher breaks down each general research purpose or

general aim into more specific research purposes and constituent elements, continuing the process until specific, concrete questions have been reached to which specific answers can be provided. An example of this is provided below.

Let us imagine that the overall research aim is to ascertain the continuity between primary and secondary education (Morrison, 1993: 31–3). This is very general, and needs to be translated into more specific terms. Hence the researcher might deconstruct the term 'continuity' into several components, for example experiences, syllabus content, teaching and learning styles, skills, concepts, organizational arrangements, aims and objectives, ethos, assessment. Given the vast scope of this, the decision is taken to focus on continuity of pedagogy. This is then broken down into its component areas:

the level of continuity of pedagogy;
the nature of continuity of pedagogy;
the degree of success of continuity of pedagogy;
the responsibility for continuity;
record keeping and documentation of continuity;
resources available to support continuity.

The researcher might take this further into investigating: the *nature* of the continuity (i.e. the provision of information about continuity); the *degree* of continuity (i.e. a measure against a given criterion); the *level of success of the continuity* (i.e. a judgement). An operationalized set of research questions, then, might be:

- How much continuity of pedagogy is occurring across the transition stages in each curriculum area? What kind of evidence is required to answer this question? On what criteria will the level of continuity be decided?
- What pedagogical styles operate in each curriculum area? What are the most frequent and most preferred? What is the balance of pedagogical styles? How is pedagogy influenced by resources? To what extent is continuity planned and recorded? On what criteria will the nature of continuity be decided? What kind of evidence is required to answer this question?

- On what aspects of pedagogy does planning take place? By what criteria will the level of success of continuity be judged? Over how many students/teachers/curriculum areas will the incidence of continuity have to occur for it to be judged successful? What kind of evidence is required to answer this question?
- Is continuity occurring by accident or design? How will the extent of planned and unplanned continuity be gauged? What kind of evidence is required to answer this question?
- Who has responsibility for continuity at the transition points? What is being undertaken by these people?
- How are records kept on continuity in the schools? Who keeps these records? What is recorded? How frequently are the records updated and reviewed? What kind of evidence is required to answer this question?
- What resources are there to support continuity at the point of transition? How adequate are these resources? What kind of evidence is required to answer this question?

It can be seen that these questions, several in number, have moved the research from simply an expression of interest (or a general aim) into a series of issues that lend themselves to being investigated in concrete terms. This is precisely what we mean by the *process of operationalization*. It is now possible not only to formulate the specific questions to be posed, but also to select appropriate instruments that will gather the data to answer them (e.g. semi-structured interviews, rating scales on questionnaires, or documentary analysis). By this process of operationalization we thus make a general purpose amenable to investigation, e.g. by measurement (Rose and Sullivan, 1993: 6) or some other means.

In planning research it is important to clarify a distinction that needs to be made between methodology and methods, approaches and instruments, styles of research and ways of collecting data. Several of the later chapters of this

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book are devoted to specific instruments for collecting data, e.g.:

- interviews;
- questionnaires;
- observation;
- tests;
- accounts;
- biographies and case studies;
- role playing;
- simulations;
- personal constructs.

The decision on which instrument to use frequently follows from an important earlier decision on which kind of research to undertake, for example:

- a survey;
- an experiment;
- an in-depth ethnography;
- action research;
- case study research;
- testing and assessment.

Subsequent chapters of this book examine each of these research styles, their principles, rationales and purposes, and the instrumentation and data types that seem suitable for them. For conceptual clarity it is possible to set out some key features of these models (Box 3.1).¹ It is intended that, when decisions have been reached on the stage of research design and methodology, a clear plan of action will have been prepared. To this end, considering models of research might be useful (Morrison, 1993).

Data analysis

The prepared researcher will need to consider the mode of data analysis to be employed. In some cases this is very important as it has a specific bearing on the form of the instrumentation. For example, a researcher will need to plan the layout and structure of a questionnaire survey very carefully in order to assist data entry for computer reading and analysis; an inappropriate layout may obstruct data entry and subsequent

analysis by computer. The planning of data analysis will need to consider:

What needs to be done with the data when they have been collected – how will they be processed and analysed?

How will the results of the analysis be verified, cross-checked and validated?

Decisions will need to be taken with regard to the statistical tests that will be used in data analysis as this will affect the layout of research items (for example in a questionnaire), and the computer packages that are available for processing quantitative and qualitative data, e.g. SPSS and NUD.IST respectively.

For statistical processing the researcher will need to ascertain the level of data being processed – nominal, ordinal, interval or ratio (discussed in Chapter 10). Nominal and ordinal scales yield non-parametric data, i.e. data from populations, where few or no assumptions are made about the distribution of the population or the characteristics of that population; the parameters of the population are unknown. Interval and ratio scales yield parametric data, on the basis of which assumptions are made about the characteristics and distribution of the wider population, i.e. the parameters of the population are known, and usually assume a normal, Gaussian curve of distribution, as in reading scores, for example. Non-parametric data are often derived from questionnaires and surveys (though these can also yield parametric data, see 'survey' in Box 3.1), whilst parametric data tend to be derived from experiments and tests.

The choice of which statistics to employ is not arbitrary, and Box 3.2 sets out the commonly used statistics for data types (Siegel, 1956; Cohen and Holliday, 1996; Hopkins, Hopkins and Glass, 1996). For qualitative data analysis the researchers have at their disposal a range of techniques, for example (Hammersley, 1979):

- coding of field notes (Miles and Huberman, 1984);
- content analysis of field notes or qualitative data (see chapter 6);