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CHAPTER 2

Selecting a research design

What does it mean to be a researcher?
What are the decisions that all researchers make?
How do you choose a topic?
How do you develop a research question?
What kind of research design will best suit your purposes?
How do you choose who or what to study?

What does it mean to be a researcher?

We become researchers for different reasons. For some of us, it is a systematic choice, often linked to higher-level study. Others of us somehow stumble into it by being invited to participate in a project or because it is the only way we can see forward with a particular issue or problem. We all start with different levels of expertise, but one thing is clear, and that is (but do not be daunted by what I am about to say) it is never as straightforward as it might appear at the start. Here are what some researchers have had to say.

> Research is a dynamic activity that travels a long and winding trail from start to finish. It is not a single event, rather the act of doing research is a process. (Anderson, 1998, p. 27)

> Research can involve asking people questions, listening and observing and evaluating resources, schemes, programmes and teaching methods. It can also be messy, frustrating and unpredictable. (Wellington, 2000, p. 3)

> Given the multiplicity of qualitative research and the incredible varieties and possible permutations of human beings and what they do, interpretive researchers have little choice but to deal with complexity and variety. (Brizuela, Stewart, Carrillo, & Berger, 2000, p. *xiv*)

> Throughout this adventure, I kept a classroom journal that I have found to be useful as a researcher. The journal entries I made before the classroom research started reflected some of the concerns I had about my teaching and the class. The entries also set me up with some very high expectations . . . I was feeling very good about myself and my new adventure! Then as we proceeded through the uncertainty, my journal revealed my own misgivings. (Burnaford, Fischer, & Hobson, 1996, p. 122)

It appears, then, that you will face uncertainty and complexity on your research journey. As with any activity you undertake, a little forethought can help prepare you for the possibilities you might face and set you up with realistic expectations for success.

To be a successful researcher, you need:
1. knowledge of your discipline, field and/or topic, and the place of research within these;
2. knowledge of the craft of research to enable you to make sound decisions; and
3. understanding of the ethical responsibilities of a researcher.

We will look at the first two in more detail in this chapter and introduce ethics only briefly, as it has a chapter of its own later.

1. Knowledge of your topic, field, and discipline,

It is important to know a little more about your topic and where it fits in its particular field and discipline. Research does not happen in a vacuum. Researchers choose to follow up lines of interest and to build expertise in the field in which they work. To make sound decisions regarding your research question and method, you need to be up to date with ideas and issues in your line of work and field of research.

Let's say you are interested in the transition from early childhood education to primary school. First, you should understand a little more about the concept of transition. A quick Internet search or visit to your library will help you get clearer definitions of what exactly you mean by transition. From here, you can access articles that discuss research around this topic in various settings. Talking to colleagues or local people with expertise in the area is also a useful place to start. You also need to know about the field in which your topic sits. In this case, if you're an early childhood researcher, you need to be familiar with what the latest research in your area is and also what is currently happening in junior primary classrooms—don't rely on anecdote, assumption, and personal experience. The same is true if you are a primary school teacher-researcher. Just because the children in your class came from a certain preschool, you can't generalise that experience to all early childhood settings.

The second thing you need to know is where your topic and field sit within larger academic disciplines such as education, sociology, and psychology. Of the theoretical perspectives that people use to explain events and phenomena in these areas, which might relate to your topic? Who are the important theorists? This doesn't mean you immediately have to read Bronfenbrenner[1] or Vygotsky[2] in the original—this will come as you get seriously into your research project. However, you do need to be familiar with their key propositions and how their work is used in your area. Read research that has used their theories as frameworks for explaining research findings and delve into more complex material as you gain confidence with the terms and underlying concepts. Coming to grips with theory is one of the exciting—and essential—parts of educational research.

Table 2.1 offers a useful checklist of questions that you can ask yourself as you begin your research journey and that you can keep in touch with as you move along your chosen route. If you cannot answer a question, note down how (the ways) you might be able to improve your knowledge and understanding. Remember, you don't need to know everything immediately, but you do need

to know your strengths and limitations and how to work towards enhancing your understanding. The more you know, the more excited about your teaching and research you'll become.

If you have difficulty accessing or evaluating the appropriate material, read (or reread) the section in Chapter 1 about making sense of research literature, and the relevant sections of Chapter 5 on reviewing the literature.

Table 2.1 Questions to ask yourself about your field of interest	
How well do you know your field?	**How can you enhance your knowledge and keep up to date?**
1. Can you describe the field in which you work and how it relates to other fields? 2. Do you have an understanding of the history of your field? 3. Do you know the main theories and theoretical models discussed in your field? 4. Do you know who the "big names" in your field are? 5. Are you familiar with current topics, issues, and debates in your field? 6. Can you easily access research and literature related to your field?	1. Read some introductory texts (the kinds that are used in teacher education institutions or for qualification upgrades) and talk to your colleagues. 2. As above, plus more comprehensive works as you gain confidence. 3. Begin by skimming the reference lists of relevant articles and do an Internet search or find a reference book with summaries of key people and their ideas.[3] When you have gained a general overview, move to articles or books by reputable scholars or the theorists themselves and tackle more complex explanations. 4. As above in 1,2, and 3. 5. Read the practitioner and academic journals in your area. Skim other publications such as the *Education Gazette*, **set:** *Research Information for Teachers, Education Review,* or the *Times Educational Supplement.*[4] 6. Look in your staff library, go to the public library, join your nearest educational institution's library or "surf the net". Talk to colleagues and local experts. Attend conferences in your field, sector, or subject area.

2. Knowledge of the craft of research

You also need to know something about the craft of research before you begin. That is what this book is for. Now is probably a good time to stop and take stock of what you do know and where you might need to put your focus. Try the checklist below. You might find it useful to come back to after you have worked your way through the whole book.

How comfortable are you with the research process?

1. Can you write a focused and manageable research question?
2. Can you select appropriate methods to investigate your question?
3. Are you able to articulate where your main theoretical ideas and methodological choices have come from?
4. Can you place your research in the context of prior research?
5. Can you plan an appropriate research timeframe?
6. Can you fit your research alongside your work and other commitments in a manageable way?
7. Are you confident that you can deal with the ethical requirements?
8. Can you conduct research competently and confidently?
9. Can you use a range of strategies to ensure your research is reliable and valid (trustworthy and rigorous)?
10. Do you have the skills to analyse, interpret, display, and discuss your data?
11. Can you present your findings in a range of ways to suit different audiences?
12. Can you relate someone else's research findings to your own practice and/or the research and practice of others?

As I intimated earlier, research isn't a paint-by-numbers activity, but it is something that can be learnt. It's a little like learning to cook. Once you have mastered the key skills and some basic recipes, you can experiment with different ingredients, methods, and tools.

3. Understanding the ethical responsibilities of the researcher

A researcher also needs to understand the importance of acting ethically. As one writer in the field explains:

> Ethics begins and ends with you the researcher. A researcher's personal moral code is the strongest defence against unethical behaviour. Before, during and after conducting a study, a researcher has opportunities to, and *should*, reflect on research actions and consult his or her conscience. Ethical research depends on the integrity of the individual researcher and his or her values. (Neuman, 1997, p. 443, emphasis original)

Because researchers are in a position of power, it is imperative that they understand the ethical implications of their research. In general, as a beginning researcher, this means you are answerable to someone for the ethical decisions you make. It might be your board of trustees, the Ministry of Education, your research project advisory committee, or the ethical clearance committee (or equivalent) of an institution where you are enrolled in higher study. You will be expected to gain informed consent from the people you are researching (your research participants) and to have considered the possible effects of your study on them.

It is unlikely that your study will lead to physical, emotional, psychological, or cultural harm to yourself or your participants, but if we continue the journey metaphor, then consider it as "risk management". Before you embark on an outing with students, you are expected to complete some form of risk management matrix, to consider all the possible issues that might arise and put procedures in place to minimise them. Chapter 4 deals with ethical considerations in more depth, but, in my experience, it is important to cultivate an ethical sensibility right from the start of your research career. As Anderson (1998, p. 16) advises: "All human behavior is subject to ethical principles, rules and conventions which distinguish socially acceptable behavior from that which is generally considered unacceptable. The practice of research is no exception . . ."

What are the decisions that all researchers make?

Regardless of your approach, each requires similar decisions.

> If you are a beginning researcher, the problems facing you are much the same whether you are producing a small project, an MEd dissertation or a PhD thesis. You will need to select a topic, identify the objectives of your study, plan and design a suitable methodology, devise research instruments, negotiate access to institutions, materials and people, collect, analyse and present information and finally produce a well-written report or dissertation. (Bell, 1999, p. 1)

LeCompte and Preissle (1993) have a useful list of the decisions that all researchers make (1–7), and I have added an eighth one.

1. Formulating the problem;
2. Selecting the research design;
3. Choosing who and/or what to study;
4. Deciding how to approach participants;
5. Selecting a means to collect the data;
6. Choosing how to analyse the data;
7. Interpreting and applying the analysis; and
8. Disseminating the findings.

The following description summarises a piece of research that I conducted in the 1990s (see Mutch, 1998). The summary focuses on the decisions that I made. Use the list above to see if you can locate each decision within this summary.

> *As a lecturer in a college of education, I watched the process behind the development of the new social studies curriculum. I wondered how the length of time that the development took and the changes that it underwent might have affected teachers and those who worked with the document. I decided to ask a small group of people in depth about their views, rather than survey a large group.*

I thought that open-ended interviews might provide more detail of people's opinions and experiences. I wanted to include a range of views, so I tried to balance gender and ethnicity. I also wanted to talk to people from primary, secondary, and tertiary institutions. I initially sent letters to people who might fit my criteria, and received 15 positive responses. I set up interview times with these people, and all but one agreed to be tape-recorded.

After the first few interviews, I started looking for patterns and themes in the written transcripts. As I interviewed more people, I started to compare these themes with those from my literature review. I then chose the most coherent way of presenting my themes in relation to my four key questions and the major ideas that emerged from my analysis. My findings were reported in several different forums and were accepted for publication in a refereed journal.

At each stage, I could have made different decisions, but my overall design would still have been affected by my research question, the data sources, and data-gathering techniques that were the most appropriate for this question.

But let us return to the eight decisions adapted from LeCompte and Preissle (1993). The first three—"formulating the problem", "selecting the research design", and "choosing who and/or what to study"—are the focus of the rest of this chapter. I cover "deciding how to approach participants" in Chapter 4 and "selecting a means to collect the data" in Chapter 6. "Choosing how to analyse the data" and "interpreting and applying the analysis" are in Chapter 9. "Disseminating the findings" is the focus of Chapter 10.

How do you choose a topic?

Where does your research topic come from? In Chapter 1, I tried to show that researchable topics are all around us. As a beginning educational researcher, you'll probably find you become involved in research in one or more of three ways:

1. You are invited to participate in a larger project by a more experienced researcher or a team of researchers, for example, in the Teaching and Learning Research Initiative or Te Kotahitanga.[5]
2. You enrol in higher-level study and need to undertake a piece of research as part of your assignment work or to complete the qualification.
3. You are motivated to conduct your own research to improve your own practice, solve a teaching/learning problem, find a solution to a management issue, or evaluate a programme.

Sometimes, the topic, possibly even the question, is defined for you. Other times, you must define the topic and refine the question yourself. As an educator,

you will find problems, issues, and questions of interest all around you. Before choosing the topic, however, you'll find there are other philosophical and practical factors to consider.

The next section encourages you to think carefully about your research topic and its ease of investigation before you refine it into a manageable research question. Marshall and Rossman (1999, pp. 9–10) suggest that a useful place to start is to ask yourself if your study has:

- should-do-ability;
- do-ability; and
- want-to-do-ability?

Should-do-ability is about the purpose, relevance, importance, appropriateness, and ethics of the research. Do-ability is about the manageability, skill required, prior experience needed, timeframe anticipated, and resource support available to conduct this research. Want-to-do-ability focuses on your own motivation, commitment, and perseverance.

Below is a useful checklist that gets you to consider the practical considerations (i.e., the do-ability) in relation to conducting a piece of research. Note how this checklist picks up many of the ideas we've already met and questions we've already asked. It also links to the two earlier sections on what it means to be a researcher and the decisions that researchers make.

Factors to consider when selecting a research topic

1. Size
- Is your topic or question carefully stated in a way that sets out the limits of your study?
- Have you focused your research in a way that will keep you on track?

2. Scope
- Have you defined the scope in terms of population and sample or setting and case?

3. Time
- Have you made a calculated guess at the length of time this study will take?
- Is the study manageable in the time you have at your disposal?
- Can you fit this study around your other work, family, or community commitments?
- Can you meet the necessary deadlines?

4. Resources
- Can you obtain the resources (financial, material, administrative, and personnel) required?
- Do you have easy access to these or the finances to support them?

5. Skill
- Do you have the data-gathering and analytic skills to conduct this study?
- Can you get help or training if it is beyond your expertise?

6. Access
- How easy is it to gain access to the site, the sample population, and/or cases you need to study?
- Have you considered whose permission you will require and how you will get it?

7. Prior knowledge
- How well do you know the field within which this topic sits?
- How familiar are you with the research, theoretical, and methodological literature around this topic?
- Do you know where to go for support or advice?

8. Motivation
- Will this topic hold your interest for the required length of time?
- Have you considered what intrinsic and extrinsic incentives might keep you going throughout the research?

Even if you don't know the answers to all these questions straight away, they will help you realise the scope of your undertaking and the commitment it requires so that you select something worthwhile, manageable, and do-able.

Here are some real-life examples of how research projects arose from events happening around the researchers (i.e., want-to-do-ability).

Vikki suffered a death in her family that left young children motherless. In her effort to understand what it was like for the children, and to be able to help them cope, she interviewed children who had recently lost a parent and adults who had lost a parent when they were young. Her particular interest was in the transition from the trauma back into the school setting.[6]

Barry took up a senior leadership role in an educational institution. He became interested in the difference between what the literature said leadership should be and what it was in reality. He conducted an in-depth case study that looked at leadership from multiple perspectives.[7]

Scanlon (2000) suggests there are three reasons for undertaking educational research (i.e., should-do-ability): to contribute to our knowledge within a particular discipline; to inform policy; and to address a specific issue or problem. If you don't have a burning question to answer or problem to solve, you might like to consider these as possible starting places for your topic. Here are some examples:

Contributing to knowledge within a discipline: *Joce used the theory of symbolic interactionism to explain how early childhood teachers construct notions of curriculum. She spent concentrated time in an early childhood centre observing, analysing documents, and conducting open-ended interviews with the staff.*[8]

Informing policy: *Ruth evaluated the effectiveness of Treaty of Waitangi workshops to inform future policy related to the teaching of Treaty issues in her institution. She found*

that the workshops were successful in raising issues, promoting discussion, and shifting attitudes.[9]

Addressing an issue or problem: *Concerned about the nature of silent bullying amongst girls, Tania set a research project in place to gain insights into how pre-adolescent and adolescent girls form friendships. Tania used video clips from popular media to stimulate discussion.*[10]

How do you develop a research question?

A research question is a way of explaining as sharply and pithily as possible to yourself exactly what you are going to research and what you might wish to find out. (Birley & Moreland, 1999, p. 7)

Probably one of the most important skills you can develop as a researcher is the ability to frame good research questions. (Anderson, 1998, p. 43)

These two quotes imply that time spent formulating an appropriate research question is time well spent. Some research questions start out as too broad in scope and have to be narrowed down, whereas others are too narrow or based on the researcher's untested assumptions.

To restate an earlier point, your question influences your research design. Your question will indicate the collection of quantitative data or qualitative data (or possibly a combination of the two). A quantitative research question begins with a proposition or theory that you set out to prove (or disprove), whereas a qualitative question requires you to gather data in order to describe a situation in detail from which you could formulate a theory. I'll consider each of these types of question in a moment, but first I want to assure those of you new to the following concepts and terminology that I will work through these ideas carefully and/or revisit them as necessary in later chapters. The further readings provided at the end of this chapter will also help you here.

Quantitative research

Quantitative research aims to numerically:
- describe a phenomenon of interest (descriptive research);
- explore relationships among variables (correlational research); or
- manipulate variables in order to measure the effects (experimental research).

To frame a quantitative research question, you need to understand some important concepts:
1. A *unit of analysis* is the object or event that you are counting or measuring, that is, the cases that make up your sample. These might be individual people

(as in a survey), interactions (as in an observation), or households (as in a census).

2. A *variable* is a concept that describes a phenomenon in a way that can be counted or measured (e.g., age, gender, IQ, mathematical ability, interest in sport). Variables can be:
   – independent, that is, influences, acts upon, or causes change in another variable; or
   – dependent, that is, is acted upon or is the effect of the prior variable.

3. *Attributes* are the categories into which you divide your variables. For example, gender might be "male" and "female"; age might be "below 20", "between 20 and 40", and "over 40"; and mathematical ability might use the stanines from a PAT test.

In *descriptive research*, measurable or observable data are collected to produce a categorisation or description of the variables or combinations of the variables. These can result in statements such as, "Twenty percent of girls between the ages of 10 and 15 read for pleasure for more than five hours per week."

In *correlational research*, researchers are interested in the relationship between variables. Researchers ask if one (the independent variable) links to or even causes a behaviour or reaction in another (the dependent variable). If, for example, we were interested in whether boys or girls choose more free-choice activities in an early childhood centre, we might ask how does the independent variable (e.g., gender) relate to the phenomenon of interest (e.g., free-choice activities in an early childhood centre)? Can we establish this by observing dependent variables, such as activity choices, length of time on task, individual or group play?

In *experimental research*, researchers manipulate one or more variable(s) to measure its/their effect on another. For example, they might decide to randomly assign a matching cohort of students to one of two groups. The experimental group receives a treatment (e.g., a new programme for learners with reading difficulties) and the control group does not. The researchers then compare the "before and after" results to see if the treatment had an effect. In classrooms, it is often difficult to control all the variables, that is, by trying to match for age, gender, ethnicity, ability, socioeconomic status, first language, time in school, number of schools attended, previous experience of a task, or the myriad other variables that might affect performance. As such, teachers are more likely to use quasi-experiments or single-case design (see Chapter 6), but these still require a unit of analysis and a set of variables.

• A quantitative research question takes a topic of interest and restates it in operational terms, that is, in terms of how you will gather the empirical data that will allow you to test your hypothesis in order to categorise or describe the relationships between your variables.

Figure 2.1 Developing a quantitative research question

RESEARCH QUESTION

Is [variable 1] related to [variable 2]?

↓

STEP 1: HYPOTHESIS FORMULATION
Which is the independent variable (i.e., which comes first)?

↓

STEP 2: HYPOTHESIS FORMULATION
What is the proposed direction of the relationship?

↓

STEP 3: HYPOTHESIS FORMULATION
Phrase the hypothesis to answer the research question and make a testable prediction.

↓

SEEK FEEDBACK
Does your research question need to be reformulated with a tighter focus?

EXAMPLE

RESEARCH QUESTION
Is [use of space in the playground] related to [chronological age]?

↓

STEP 1: WHICH IS THE INDEPENDENT VARIABLE?
The independent variable is chronological age, as this logically precedes use of playground space.

↓

STEP 2: WHAT IS THE PROPOSED DIRECTION OF THE RELATIONSHIP?
Increasing chronological age leads to a decreasing use of playground space.

↓

STEP 3: PHRASE THE HYPOTHESIS TO ANSWER THE RESEARCH QUESTION AND MAKE A TESTABLE PROPOSITION

The lower the use of physical space in the playground, the greater the chance that the pupil will be older.

↓

SEEK FEEDBACK: DOES THE RESEARCH QUESTION NEED TO BE REFORMULATED WITH A TIGHTER FOCUS?
Are older children less likely to make use of space in the playground?

Quantitative research requires you to restate your research question as a *hypothesis*. This is your best guess about the relationship between the variables that you will then set out to test. The following characteristics of hypotheses are adapted from teaching notes compiled by my colleague, Jean Rath.

A hypothesis:
• Is logically linked to your research question;
• Is a statement about the relationship between variables;
• Is clearly stated in a form that gives variables precise meanings;
• Is testable by means of gathering empirical data;
• Uses variables that are measurable in an acceptably accurate and reliable way; and
• Is falsifiable, that is, it must be possible to disprove the claim in the hypothesis.

Jean also has a very helpful flow diagram (Figure 2.1) that shows you how to relate your research question to your hypothesis. An example of the chart "in use" is included in the figure.

Later we will see that how you state your research question and your hypothesis influence the research methods and tools you select.

Many beginning researchers feel comfortable with quantitative research because once they have designed a clear and measurable research question and its companion hypothesis, the rest of the process follows logically. Other researchers find their interest is in what it is like for individuals within a setting or for groups of people coping with a particular phenomenon. They don't want to prove or disprove their original hunch; they simply want to find out what it is like from the perspectives of their participants. They might prefer to use qualitative methods.

Qualitative research

Qualitative research aims to uncover the lived reality or constructed meanings of the research participants.

Rather than using variables and their attributes as categories, and units of analysis by which to count or measure the occurrences of the variables, qualitative researchers gather rich description of the phenomenon of interest. This detail may come from careful observation, open-ended interviews with participants, or detailed examination of documents or artefacts. Any categorisation or theory building comes later as the data are thematically analysed and constantly revisited and reduced.

In *quantitative* descriptive research, such as in a survey, for example, many subjects may be asked the same questions. The findings are then generalised to all similar people or settings. In *qualitative* descriptive research, a few people (in some cases, only one person) may be asked many questions or allowed to tell their own stories in their own ways. The aim is to illuminate the experience or understanding for others but not to generalise from it. The case is considered to be bound by context and situationally specific. However, that is not to say that we cannot relate or compare what we find to other situations or settings if this enhances our learning or understanding.

My colleague, Jean, has also designed a format (Figure 2.2) for helping formulate qualitative research questions.

Now that you have a process for determining and refining an appropriate research question, we can move on to other research decisions.

Figure 2.2 Developing qualitative research questions

STEP 1
Select a phenomenon, issue, or event you want to know more about.

↓

STEP 2
Decide which key words or phrases will help you focus on your phenomenon.
(For example, *construct*, *interpret*, *understand*, *negotiate*, *perceive*, *make sense of*)

↓

STEP 3
Design a question based on one of the following patterns.

How do [the people] [in this setting] *key word* [the phenomenon of interest]?
or
In what way is [the phenomenon of interest or issue] [*key word*] by [the people] [in this setting]?

EXAMPLES

(adapted from some research projects we have already read about in this book)

How do teachers in early childhood settings *construct* notions of curriculum?
How do stakeholders in a New Zealand primary school *perceive* effective leadership?
or
In what ways are death and dying *made sense of* by children who have faced the death of a parent?
In what ways are the processes of educational policy making *described* by policy makers in high-profile positions?

What kind of research design will best suit your purposes?

To answer this question, I need to continue considering our two main approaches to research—quantitative and qualitative. I will again discuss them separately, not because I wish to promote a separatist way of thinking but for ease of understanding and because the two approaches arise from different research traditions and so have developed different research designs. Figures 2.3 and 2.4 give an overview of quantitative and qualitative research designs. I will work through the various stages in subsequent chapters in this book.

- *Quantitative research* design is more linear and sequential than qualitative. One step determines the next, and each is dependent on what has gone before. The logic is deductive in that it requires researchers to work from a theory or hypothesis and then gather data to describe it or test it.
- *Qualitative designs* are more evolving and often circular. The logic is inductive—from data to theory.

Once you have narrowed down your research-question problem or issue, you need to work through a further series of questions to help you select the most appropriate research design:
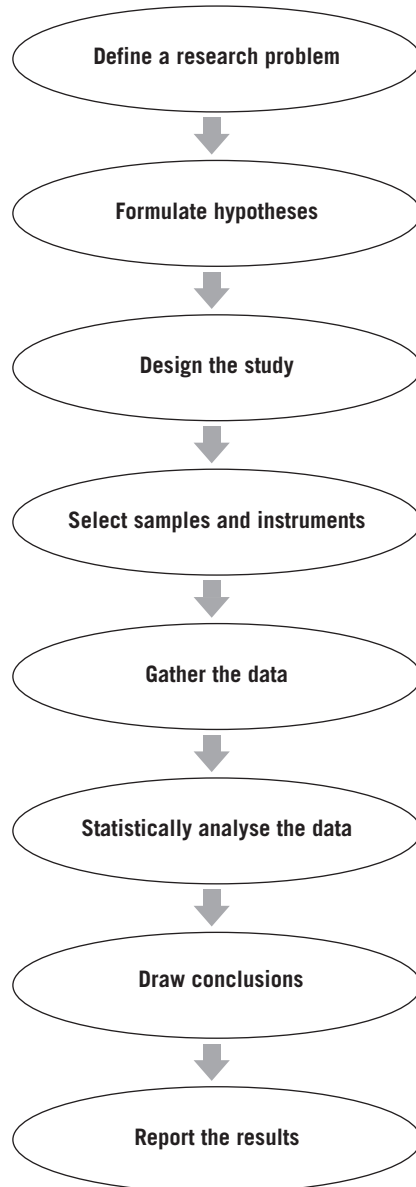
1. What will be the most suitable methodology, approach, or research style?
2. What kind of data do you anticipate gathering?
3. How might you gather this data?
4. From whom will you gather this data?
5. How might you analyse this data?
6. How might you display this data?

Figure 2.5 sets out these questions along with selected answers. These are not the only questions that you could ask at this stage, nor the only possible answers, but they are a useful place to start if you are less familiar with the research process. Although Figure 2.5 displays your choices as either quantitative or qualitative, you could design research that combines the two—they are not necessarily mutually exclusive.
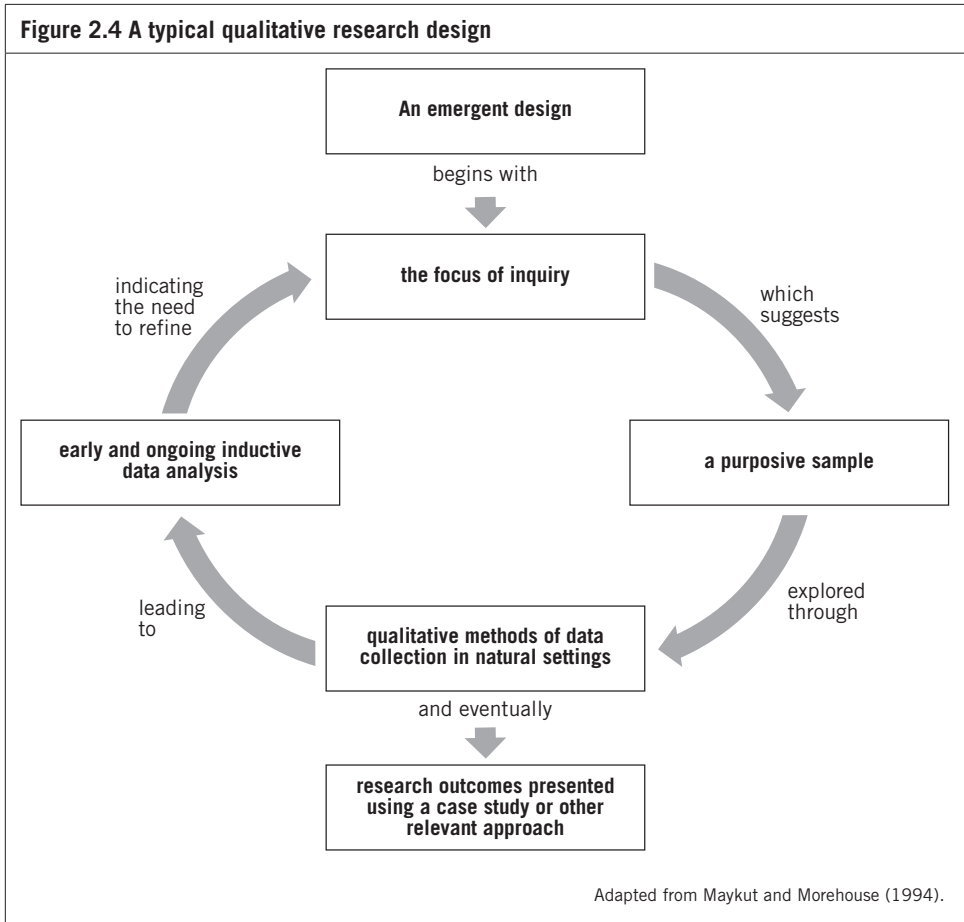
How do you choose who or what to study?

When you have considered a suitable research design, LeCompte and Preissle (1993) suggest you next consider your data sources. You might choose to get your information from human sources (e.g., through a *quantitative* survey or a *qualitative* case study), or you might use non-human sources (e.g., existing

Figure 2.3 A typical quantitative research design

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        ┌─────────────────────────────┐
        │   Define a research problem  │
        └─────────────────────────────┘
                      ↓
        ┌─────────────────────────────┐
        │    Formulate hypotheses      │
        └─────────────────────────────┘
                      ↓
        ┌─────────────────────────────┐
        │      Design the study        │
        └─────────────────────────────┘
                      ↓
        ┌─────────────────────────────┐
        │ Select samples and instruments│
        └─────────────────────────────┘
                      ↓
        ┌─────────────────────────────┐
        │       Gather the data        │
        └─────────────────────────────┘
                      ↓
        ┌─────────────────────────────┐
        │  Statistically analyse the data │
        └─────────────────────────────┘
                      ↓
        ┌─────────────────────────────┐
        │      Draw conclusions        │
        └─────────────────────────────┘
                      ↓
        ┌─────────────────────────────┐
        │      Report the results      │
        └─────────────────────────────┘
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Taken from Burns, (2000), p .42.

Figure 2.4 A typical qualitative research design

An emergent design

begins with

the focus of inquiry

which suggests

indicating the need to refine

a purposive sample

early and ongoing inductive data analysis

explored through

leading to

qualitative methods of data collection in natural settings

and eventually

research outcomes presented using a case study or other relevant approach

Adapted from Maykut and Morehouse (1994).

statistics or documents), or you might want to employ a combination of all three. This section gives guidance on choosing your sources and samples.

1. Human data sources

One of the decisions you need to make when using human subjects in research relates to the sample selected to represent your chosen population or the case(s) to illuminate your chosen phenomenon. There are two main sampling techniques:

- *probability sampling*, used mainly in quantitative research; and
- *non-probability sampling*, used mainly in qualitative research.

The aim, when employing descriptive quantitative research, is to make statements with confidence. To get the most accurate description of a situation or picture of a trend, you could ask every member of the relevant population, but this is not possible (the exception being the national census, and we can only

guess at the amount of organisation and co-ordination that this entails). Instead, you ask a sample from that population that you expect will fairly represent it.

Quantitative research uses probability sampling because it allows us to estimate to a certain level of probability that our sample will be representative. It also ensures that our sample is free from researcher bias. One of the key traditions in this research approach is that of researcher objectivity.

Probability sampling

Probability sampling means that it is possible to specify the likelihood of any element that meets the criteria for the unit of analysis being included in the sample.

There are three main kinds of probability sampling techniques: random, systematic, and stratified.

- *Random sampling* means that any element has the same chance as any other of being included in the sample. The subjects are chosen by random, using a method such as a table of random numbers or a computer-generated random sample.
- *A systematic random sample* is based on some consistent way of selecting subjects, for example, every fifth name in the phone book or every 10th school from the Ministry of Education database.
- *A stratified random sample* selects subjects at random from a set of categories that represents the profile of the population, for example, so many males/females, a percentage of each ethnic group, a representative geographic spread.

As stated earlier, in line with the characteristics of quantitative research, probability sampling aims to reduce researcher bias and to extrapolate from the findings to the wider population. Great care therefore is taken to ensure that the sampling procedures are accurate and representative.
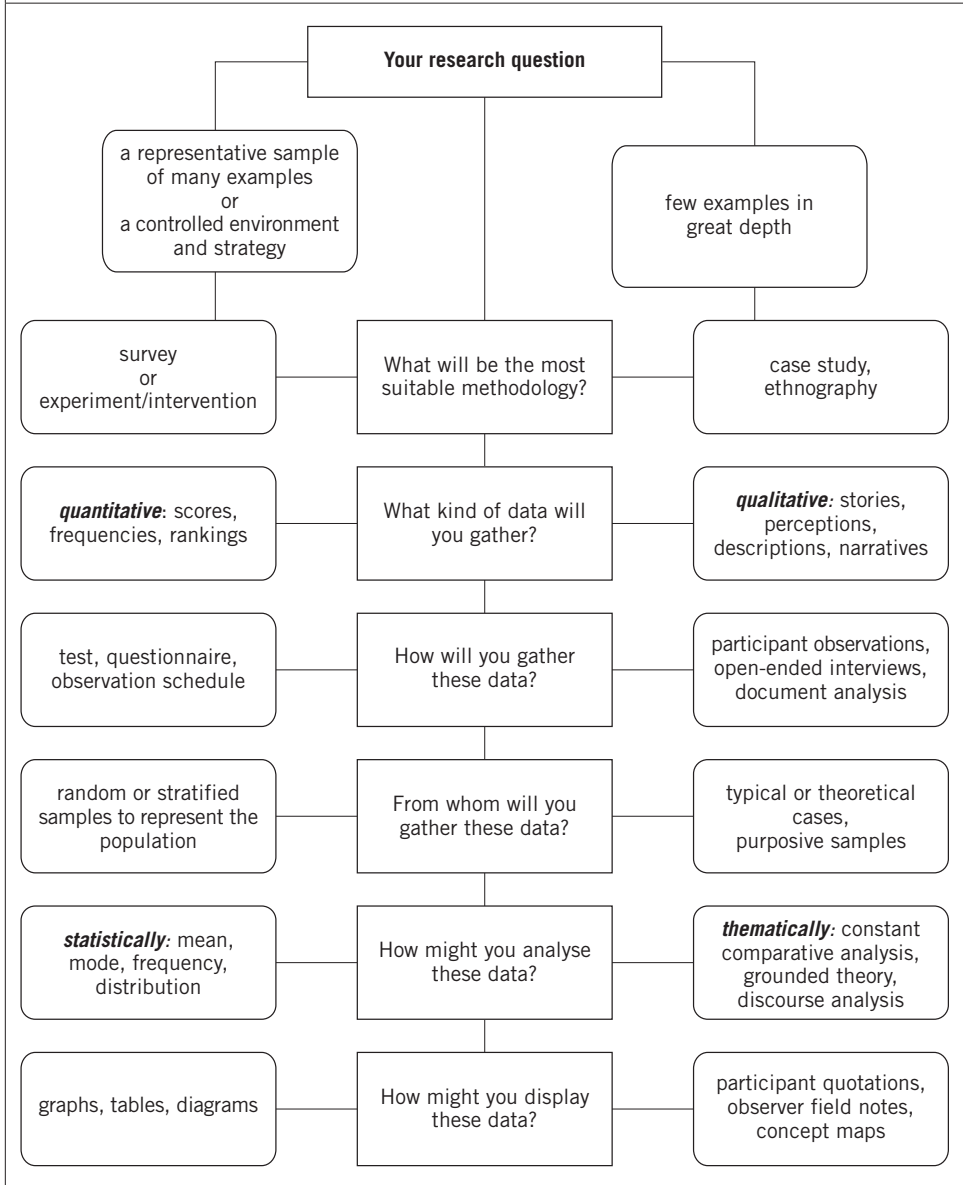
Non-probability sampling

In non-probability sampling, it is not possible—or even desirable—to generalise from the sample to the population. The sample is chosen for specific reasons to expand our understanding of the phenomena and not to make broad claims. The sample might, for example, be a sample of only one.

The three main kinds of non-probability techniques are purposive, theoretical, and quota sampling.

- *Purposive samples* are selected because they suit the purpose. They might be a typical example, an atypical example, an exemplar, or a well-rounded example of the case or phenomenon you wish to study.

Figure 2.5 Research questions and selected answers

a representative sample of many examples or a controlled environment and strategy		few examples in great depth
survey or experiment/intervention	What will be the most suitable methodology?	case study, ethnography
quantitative: scores, frequencies, rankings	What kind of data will you gather?	**qualitative**: stories, perceptions, descriptions, narratives
test, questionnaire, observation schedule	How will you gather these data?	participant observations, open-ended interviews, document analysis
random or stratified samples to represent the population	From whom will you gather these data?	typical or theoretical cases, purposive samples
statistically: mean, mode, frequency, distribution	How might you analyse these data?	**thematically**: constant comparative analysis, grounded theory, discourse analysis
graphs, tables, diagrams	How might you display these data?	participant quotations, observer field notes, concept maps

Your research question

- *Theoretical samples* are guided by the theoretical framework you are using or the theory arising from the data analysis. If, for example, the theory describes four main categories, the sample might be examples of each.
- *Quota sampling* is similar to stratified sampling in quantitative research and is made up of quotas for each of the categories you wish to represent (e.g., age, gender, school decile rating).

Within these, you might also use convenience or snowball sampling.

- *Convenience sampling* simply means that you compromise your search for the perfect example and choose one that is easier to access but will provide useful data to illuminate your phenomenon of interest.

- *Snowball sampling* is often used when access to a particular group is more difficult. Your first subject recommends another subject, who recommends the next, and so on. These subjects still fit within your purpose or theory, but you have less control over the actual choices.

However you select your sample, the expectation is that you will have followed an appropriate procedure and can justify your choices.

2. Non-human data sources

If you are not using human subjects, or you are but also require further information, you could gather your data from existing sources, but you will still need to consider and justify your selection of these. Within educational research, these sources include:

- *Existing statistics:* sets of test scores, databases, yearbooks;

- *Documents:* curriculum or policy documents, school plans, timetables, teacher or curriculum plans, textbooks, portfolios of children's work;

- *Archival sources:* old published documents, unpublished personal documents (such as diaries, letters, ledgers, minutes of meetings), photographs, workbooks;

- *Visuals:* photographs, paintings or sketches, maps, symbols or logos, computer-generated images;

- *Audio-visuals:* tape recordings, video recordings, radio broadcasts, films, computer slideshows, musical items, dramatic representations, dance, performances;

- *The Internet:* educational sites, sites for children, sites for parents, sites set up by government departments or organisations, email communications, listservs, other discussion lists; and

- *Artefacts:* objects of historical or cultural significance, everyday objects, artworks, models, work samples, portfolios.

Chapter summary

- Successful researchers need knowledge of their discipline or field and topic, knowledge of the craft of research, and an understanding of the ethical responsibilities of a researcher.

- All researchers make decisions about formulating the problem, selecting the research design, choosing who and/or what to study, determining how to approach participants, selecting a means to collect the data, choosing how to analyse the data, interpreting and applying the analysis, and disseminating the findings.
- In choosing research topics, researchers need to consider should-do-ability, do-ability, and want-to-do ability.
- Researchers need to consider a range of factors when selecting a research topic, such as size, scope, time, resources, access, skill, previous knowledge, and motivation.
- Research questions need to be relevant, concise, and related to the choice of research design.
- Quantitative research designs are structured and linear.
- Qualitative research designs are more emergent and often recursive.
- Quantitative research uses probability sampling methods.
- Qualitative research uses non-probability, often purposive, sampling.
- Data sources in educational research are often human subjects in everyday settings, but researchers also use non-human sources, such as documents and artefacts.

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