'How to' guides collection











This is a collection of these five 'How to' guides



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Plan your research – meet your objectives

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'How to' Guides



This *How to guide* provides an introduction to planning a research project. It is intended for senior leaders, teachers and other school staff interested in carrying out their own research. The guide offers some areas of consideration and some practical tips to assist research project planning.

Before you embark on your research project it is essential that you plan it thoroughly. Throughout your research, your plan is likely to constantly change and evolve. While this can be a little unsettling, it can also be exciting. The better you plan your research at the outset though, the easier the whole process will be and the less likely that changes will need to be made.

Figure 1: Steps to planning research

Define your area of interest		e.g. literacy
	_	
Narrow your focus		e.g. boys' engagement with literacy lessons
Write your research question(s)		e.g. how do Year 6 boys make choices about which reading books they will take home to read?
Choose your method(s)		e.g. surveys of Year 6 boys; interviews with some Year 6 boys and the school librarian
Who are your research participants?		e.g. Year 6 boys; school librarian

When doing a research project, especially if you are new to research, it is often best to start small. A small, simple but well-planned project is better than being over ambitious. There are a number of steps to take when planning your research, which we outline in Figure 1, along with an example.

Define your area of interest

If you've decided to do some research, you probably already have a good idea about the broad topic area you want to investigate and why. In the example above, the area of interest is literacy. Ideas for research can come from anywhere. They are usually grounded in people's experiences; come from a problem they want to try to understand or overcome; or are developed from a hypothesis they want to test.

• Whatever the starting point, a research project must be based on objective, systematic and rigorous approaches to explore and test the questions which stem from that original idea.

> Why am I interested in this area?

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Narrowing the focus of your research

- Within the broad area you have chosen to research, you will need to decide which particular aspect/s of that area you are interested in exploring. This is sometimes called the 'research focus'.
- To help narrow the focus of your research, you could read around the topic area; talk to colleagues; or review your school's data to identify a particular challenge it is facing. Taking the example in Figure 1, you may be particularly interested in boys' engagement with literacy lessons because your attainment data shows that girls tend to outperform boys.
- At this stage, you need to think about what you hope to achieve from your research (i.e. what are your aims and objectives?). It is a good idea to make a record of your aims and objectives, as you will need to keep referring to them throughout your research.
- Depending on your topic area, you may need to define some key words or phrases. In the example above, how will you define 'engagement' for your research project? For example, you could monitor the extent to which they proactively engage in lessons.
- You may also need to think about any sub-groups you are interested in. For example, do you want to investigate literacy with all boys in your school or only those in a particular year group? You could then decide to narrow the focus further and concentrate

on learners in one class or who have English as an Additional Language.

During this stage it can be helpful to:

- write a paragraph or two describing what your research is about, and where, how and why you are going to do it. You can keep referring back to this as your research progresses – it will help you to keep on track, particularly when you are analysing and writing up your research.
- explain your research to other people, such as friends, family and colleagues. This will help you to clarify your thoughts. Furthermore, their questions could alert you to any assumptions you have made or key words or terms you need to define.



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Plan your research - meet your objectives



Writing the research questions

The next stage is to write your research question(s). Research questions detail precisely what your research is about. A good research question is clear, explicit and should define the parameters of the research. Research questions should be 'open' to allow room for you to explore all possibilities; including those you had not anticipated. An 'open question' usually starts with 'how'; 'why'; 'where' or 'what'.

Example research question:

How do year 6 boys make choices about which reading books they will take home to read?

The example above makes it clear what the research will explore and what the parameters are. It states that the research is limited to Year 6 boys only (i.e. not girls or different year groups) and their reading book choices.

When writing a research question there are some things to consider. These are outlined in Figure 2.

Figure 2

Be realistic

- It is good practice to have maybe one or two well formed questions.
- These can be supplemented by sub questions if needed (for example, 'Does my school offer a wide variety of reading books for year 6 boys?').

Take your time

- Writing a good research question can take time.
- It is a good idea to reflect on your research question as it may need to be refined.
- It can be useful to write several versions of the same question and then compare them to ascertain where exactly you want to focus your research.

Ask yourself

- How are the questions different?
- What difference will asking that question make to how you do the research?
- Which question do I really want to know the answer to?

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Choosing a method

Once you have decided on your research focus and your research question(s), you need to decide which method or methods you will use to collect the data to answer those questions. A well written research question may suggest which method or combination of methods is appropriate to use.

Often, research projects adopt a mixed method approach (i.e. they adopt more than one method). This can offer a broader insight into your research question or help to engage a wider range of stakeholders. It is not always necessary or appropriate to choose a mixed method approach though.

That said, there is unlikely to be only one way to answer your question. When choosing your method, an element of choice comes into play. The methods you choose are likely to depend on:

 your skills and preferences. If you do not feel confident with numbers and statistics for example, you may want to choose a qualitative approach (if this will address your research question).

- your research question. For example, if you want to know how many Year 6 boys take reading books from the school library each week, you are unlikely to ask all Year 6 boys this question. Instead, you would be better collecting this information from library records or pupils reading diaries. If however, you want to know what the boys think about the selection of reading books in your school, you would be better asking them either through a questionnaire or through group or one to one interviews.
- the methods which are most appropriate for your research participants. For example, carrying out a paper survey with reception class children will not be appropriate as they are unlikely to be able to read or respond to the questions. Asking them the questions verbally and asking them to put up their hand for each response option would work better.
- practical considerations; such as time, costs, resources, access and ethics.



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Pinning down the details

In addition to deciding on the method(s) you should begin to decide on the details of your research. These include:

Notes Which year groups, classes, staff, parents, governors or other stakeholders will you involve? Who is going Will you only carry out your research with one of these stakeholder to take part in groups or a combination of them? Will you involve girls and boys, particular cohort of learners (e.g. those the research? • receiving free school meals) or particular subject areas or those working towards a particular gualification (e.g. A-level students)? Have you drawn up a detailed research project schedule/timetable? When are you How long you will need to spend on different tasks? ٠ going to do How long you will ask participants to spend on your research? your research? Have you got a deadline you need your research complete by? Have you factored in term times and examination periods? • Will you do the research alone or will you involve others? Who is going to be involved What about involving learners themselves? in conducting the research If you are involving others, what are their roles and specific tasks going and collecting the data? to be? For example, how many classes, learners, staff, schools will be What, and how involved? How many questionnaires will you send out? And how many do you much, data will • you collect? think you will get back? How many interviews will you carry out?

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How are you going to record, collate, store and analyse the data?	 How will you record what people have told you? Will you audio-record or make notes – or both? How will you collate your data? For example, will you put all your questionnaire responses into a spreadsheet ready for analysis? Where will you securely store the data you collect, to ensure you comply with the Data Protection Act? How will you label the data to anonymise it? How you will analyse your data? Do you need any specialist training or software? 	Notes
How are you going to present your findings?	 Who do you want to share your findings with (your intended audience)? What kind of outputs will engage your intended audience(s)? If you are writing a report, what will the main section or chapter headings be? How will you make your data more accessible and lively? (e.g. will you use graphs, charts, tables, quotes or vignettes?) 	
How will you share or disseminate your findings with others?	 What networks or existing publications can you use to make others aware of your findings? For example, will you give a presentation, write a report, write a piece for the school newsletter or an article for a journal? How will you encourage your senior leadership team to use the findings from your research in the school improvement planning process? 	
Even though some of these tas ensure that your project remain	ks seem a long way off, you need to plan them at the outset. This will help to s manageable and keeps on track (and so will answer your research question).	



Practical considerations

When planning a research project there are always practical considerations, which will limit what can be done. These include:



Time: Be realistic about how much time you and anyone else working with you will need to spend on your project. Research tasks often take longer than you initially think so it is a good idea to add in some contingency time, or ask other people who are experienced in carrying out research for their advice. It is worth considering whether there are any fixed time points that you need to work to. You might, for example, need to collect the data at a certain point in the school year or in time to inform a particular planning decision. Fixed deadlines such as these will affect your research design.

Access: You will need to consider how you will access your research participants. If you are carrying out research within your own class or school, this may be relatively easy. If, however, you are trying to access people outside of your school (such as staff in another school or setting or grandparents of your learners) this may be more difficult. Ensure you get permission from the school's headteacher before commencing any research within your or another school.

Resources and costs: Consider what resources you will need for your research and how much these will cost. Think about software, equipment (e.g. audio recorders), printing and library access costs. Consider what you need to buy and what you can hire or borrow.

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Support: Have you considered what support you may need? This can include training in how to use certain methods or software, but it can also be emotional support from friends and families. Some research projects (as part of academic studies) may require more specialist support from expert mentors or supervisors.

Ethical considerations: You need to consider the ethics of your research from the outset and throughout your project

Consider keeping a record of your research project:

Keep detailed notes about what you have done, ideas, contacts and decisions you have made. These can be helpful later on when you come to write up your research. Some people find it useful to keep a more reflective research diary in which you write down your thoughts and feelings about the project. This may increase the time commitment involved in your research though, but can help you identify any underlying assumptions which you might not have been aware of up to that point.



Other useful resources

We hope that this short guide to planning your research has whetted your appetite for carrying out your own research. NFER has published a series of 'How to' guides for practitioners who want to carry out their own research, helping you put your ideas into practice. NFER have books and training days available, as well as free guidance on topics to research and methods of research. Why not get recognition for your achievements in research in your school, college or early years setting by applying for the NFER **Research Mark? Visit** www.nfer.ac.uk/ris for more information.



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Run action research – do it yourself

This short guide provides an introduction to action research for senior leaders, teachers and other school staff who are interested in carrying out research, with a view to improving practice.

What is action research?

By 'action research' we mean investigating an educational situation, context or challenge and using what we find out to improve things.

Action research is similar to any other research in many respects – it:

- develops new knowledge and understanding
- should refer to the wider research context
- is carried out ethically
- uses the same methods
- involves reflecting on and interpreting data
- should be shared.

But there are some differences. In action research:

- a desire to *improve* things (such as practice or outcomes) is the core motivation
- the researcher is *part* of the situation they are investigating
- the process of carrying out the research is as *important* as the results.

Why do action research?

There are many reasons! Action research tends to appeal to schools because it:

- can be carried out by anyone senior leaders, teachers, classroom assistants, support staff, learners (of any age), parents and carers
- can help you to understand your classroom and your learners' needs better
- can help you to improve your practice, which can lead to better experiences and outcomes for your learners
- embeds reflection into your teaching practice, making action research a valuable continuous professional development (CPD) activity
- gives you a framework in which to engage learners and colleagues in meaningful discussion about how to improve teaching, learning or school life more generally
- can be a core part of school improvement, helping to embed a culture of enquiry.

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What are the challenges?

As with any research, action research is not without its challenges. However, these are surmountable. We outline some of the issues that education practitioners have told us about below, along with some solutions.

• Finding time to do the research. Be realistic about how much time you can give when you decide the scope of your research. It is better to do a small project well, than an over-ambitious one badly. Think about ways to incorporate collecting data into your lessons to streamline the process; for example, you could use test data as evidence or ask your learners to interview each other as part of a lesson. Also, try to involve other colleagues in your research, to share the load (and the benefits).



- **Getting senior leaders on board**. Action research involves trying new things and taking some (small) risks. Make sure that your Senior Leadership Team (SLT) supports this. Developing a mini proposal for the research can help. This could set out:
 - your research questions
 - _ how the project will benefit your school
 - _ a (realistic) timetable
 - the amount of staff time and any other resources you will need
 - _ how you will make sure the project is ethical
 - a risk assessment
 - You could also point your SLT towards NFER literature (www.nfer.ac.uk/ris) on the value of being a research-engaged school, to help to make your case.
- Getting to grips with research methods. As a practitioner, you use research skills every day: asking questions; reflecting on data and writing reports. NFER's Methods of Research web pages (www.nfer.ac.uk/ris) will help you to build on what you already know about research methods and processes.
- Being objective. It can be hard to stand back from the research when you collect and analyse the data, especially when this takes place within your own classroom or school. Actively looking for evidence

that goes against your own view is good practice and will help you to avoid biasing your results. This is also where having colleagues to help you with your research may help provide a different perspective.

- Handling negative results.
 Some practitioners are
 disappointed when their
 research suggests that a new
 approach has not worked.
 However, a negative finding does
 not mean that your research has
 failed! In fact, this learning is
 really valuable, as it prevents you
 and your colleagues from
 wasting resources on an
 unsuccessful approach.
- Handling positive results. Even if your research shows that a new approach has had a positive effect, some practitioners may be reluctant to 'unlearn' their current practice. Engaging colleagues in the action research from the start (or in a future cycle) can help them to see the value of the research and of acting on its findings.

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What does action research involve?

Action research involves a cycle of processes, which the diagram below sets out. In essence, an action researcher plans a change, implements it, observes what happens and then reflects on it. But it does not stop there. Having completed the one cycle of action research, an action researcher would then start another, planning a new change based on the learning from the first cycle. You can continue with your action research for as long as is useful and practical.



How do I do action research?

Looking at each step in the action research cycle in turn (plan, act, observe, reflect), we outline the key activities you will need to carry out. You can find out more detail about these steps in our other guides for practitioners (www.nfer.ac.uk/ris).

1. Plan (the most crucial step!)

	your research		the change you want to investigate	
•	Decide your research question. Good starting points include: known issues/weaknesses, consultation with colleagues/ learners/parents/carers, and review of Management Information data.	•	For some research questions, you will need to plan the change you want to make – this might be a change to your practice, a different approach to part of your role, or	
•	Design your research and choose your methods based on the nature of your research question.		using a different set of resources. Talking to colleagues and reading existing practice or research literature can help you to identify	
•	Decide how you will ensure your project is ethical. Check your school's data policies and identify whose consent you need to go ahead with the research. This may include senior leaders, colleagues, learners and parents/carers.		promising approaches to test out in your own school.	
•	Ask a colleague to act as a critical friend, reviewing your research as you go along.			

...and don't forget to

- Get colleagues on board tell them what you plan to do and why. Their engagement is key.
- Make a project plan, setting out when you will trial the intervention and collect, analyse and report on the data.
- Make sure your project is manageable within the amount of time you have!

2. Act:

• Put your plan into action!

3. Observe:

- Collect your data collecting data from different sources is good practice (e.g. colleagues' views, learners' views and test data)
- Get participants' consent.

4. Reflect:

- Sort and analyse your data
- Be objective
- Reflect on what the data means and test your interpretation out on your critical friend and/or the people who participated in your research project.

...and then repeat steps 1 to 4 again.

Case study: using action research to investigate ways to improve learners' writing

The diagram below describes how teachers from two merged primary schools investigated how different ways of marking and feedback could impact on learners' writing.

Action research cycle at a school



Research ideas

The list of topics you could research is almost endless. Here are some research questions that other action researchers in schools have investigated.

- What type of essay feedback is most useful to students?
- What are the benefits of working outside the traditional classroom for very
- Do rewards contracts motivate A-level students?
- Does using interactive whiteboards help learners'
- How can your school engage 'hard to reach' parents/
- What are the benefits and challenges of supporting young people to do their own

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Sharing your research

Sharing your research is also an important element of action research. This diagram highlights some of the reasons why this is the case.



You

Forces you to reflect on your findings, helping your interpretation of the data

Participants

Thank people for their time and contribution to your research

Your school

Provides learning for colleagues Supports school improvement

Education community

Offers lessons to the wider education community, who can avoid what your research showed did not work well, and try out what worked well

Other useful resources

We hope that this short guide to action research has whetted your appetite for carrying out your own research. NFER has published a series of 'How to' guides for practitioners who want to carry out their own research, helping you put your ideas into practice. NFER have a book on action research. Action research: making a difference in education. Other books and training days are also available as well as free quidance on topics to research and methods of research. Why not get recognition for your achievements in research in your school, college or early years setting by applying for the NFER **Research Mark? Visit** www.nfer.ac.uk/ris for more information.

The material in this guide has been re-purposed from Riggall, A. (2009). 'Action research: what is it, who does it and why?' In: Lawson, A. (Ed) *Action Research: Making a Difference in Education* (Volume 1). Slough: NFER.

The NFER 'How to... Write up Your Research' guide has lots of ideas on how to present your findings in interesting ways and share it with others – www.nfer.ac.uk/ris

How to...



Run qualitative and A quantitative research From definitions through to analysis

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Run qualitative and quantitative research

'How to' Guides

This *How to guide* provides an introduction to gualitative and guantitative research. The guide is intended for senior leaders, teachers and other school staff who are interested in carrying out research.

1 What is qualitative and quantitative research?

Researchers have long debated how to define 'qualitative' and 'quantitative' research. We are not going to go into that debate here, but instead provide a definition of each which we feel best describes each approach (see Figure 1 below).

Figure 1 Definitions of qualitative and quantitative research

Qualitative research is 'interested in understanding the meaning people have constructed. that is, how people make sense of their world and the experiences they have in the world.'

(Merriam, 2009, p.13)

Quantitative research is 'explaining phenomena by collecting numerical data that are analysed using mathematically based methods (in particular statistics).'

(Aliaga and Gunderson, 200)

Indeed, some people think of qualitative research as researching words and quantitative research being about numbers.

The figure opposite shows some general characteristics of gualitative and guantitative research.

Figure 2 Characteristics of gualitative and guantitative research

Qualitative research

- Data is complex, impressionistic, personal, rich.
- Explores attitudes, beliefs, feelings and perceptions and considers experiences as they are lived, felt or undergone.
- The data collected is not in the form of numbers.
- Explores the topic in depth.
- Can use examples which might be illuminating rather than which are representative of the group you are researching.
- Findings are not able to be generalised, but may be able to be related to other, similar contexts or situations. For example you may have only studied your own school, but it is likely that the findings are applicable to similar schools.
- Suggests reasons why two variables might be linked (a variable is something which can change) (see section 6.2.1).
- Needs to be well thought out at the beginning. particularly how you will collect and manage data.
- Requires you to be able to think on your feet during data collection.
- Requires you to be able to make links between the data during the analysis.

Quantitative research

- Often explores a topic broadly.
- Data is hard, impersonal and factual. It minimises any biases the researcher might have.
- The data collected is in the form of numbers.
- Findings can be generalised to a specified group (or 'population').
- Establishes relationships between variables.
- Focuses on things which can be observed and measured.
- The design and planning stage needs to be very detailed and disciplined. It can take guite a long time to devise surveys, pilot them and make revisions.
- Data collection is generally straightforward and the write-up is largely defined by the survey.

It is possible to mix qualitative and quantitative methods. This is sometimes preferable, where time and resources allow. It enables the research to explore a topic broadly (using quantitative methods) and more in-depth (using qualitative methods). This is known as **mixed methods research.**

When undertaking any research, there are ethical and legal considerations that need to be made. Briefly, these relate to ensuring your research does no harm to anyone involved in the research and that the Data Protection Act and other laws are adhered to. Further information on ethics can be found on the website www.nfer.ac.uk/ris

2 An overview of the main methods used in qualitative and quantitative research

Here is a brief overview of the main methods that can be used in qualitative and quantitative research.

2.1 Interviews

These can be used to explore issues, views and attitudes in-depth. Interviews can be 'structured', 'semi-structured' or 'unstructured'. A structured interview contains specific questions and follows a specific pattern with all participants; it is more like a questionnaire. An unstructured interview is very broad and open-ended; it is more like a conversation led by a small number of questions. Between these two extremes is what is known as a 'semi-structured interview'. A semi-structured interview involves working from an 'interview schedule', a document that outlines the main questions to ask. It offers greater flexibility than structured interviews, as the order of questions can be moved to best fit the conversation or individual participants. It also offers the opportunities to ask additional follow-up questions.

Figure 3 Examples of question types

Structured question example

To what to extent do you agree with the statement 'I became a teacher because I wanted to work with young people'?

To a great extent To some extent Not at all

Semi-structured question example

Can you tell me about why you became a teacher at this school?

Unstructured question example

I am interested in hearing about how you became a teacher, can you tell me a bit about that?

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Interviews can be conducted face-to-face, by telephone or online – via webcam for example. Most unstructured and semi-structured interviews will be audio-recorded (but only where the respondent gives you permission to do so) and then typed up. There is no need to type up structured interviews as the range of responses is limited, but you do need to record which response is given each time. Remember to type up notes so that there is a written record of the interview for use during analysis.

2.2 Focus groups

Instead of one-to-one interviewing, focus groups are interviews carried out with a group of people on a specific topic. They can offer an efficient way of gathering a range of views on a particular topic. Participants tend to comprise similar characteristics (for example, a group of primary school teachers, or Year 7 learners) rather than a mixed group of participants with dissimilar characteristics (e.g. teachers from primary and secondary schools or learners from different year groups¹). Focus groups tend to have between five and ten participants per group.

Although they have much in common with one-to-one interviews, focus groups differ in that respondents often lead the discussion, while the facilitator's role is to keep the discussion on track. This enables the group to express a variety of views and can bring any differences of opinion to light. When running a focus group, it is preferable to have a note-taker, to help the facilitator manage the group and take notes. More experienced researchers may run focus groups alone and rely on the audio-recording to capture the data. See the '*How to... Run focus groups*' guide available at www.nfer.ac.uk/ris

2.3 Observations

These provide insights into individual or group behaviours. It is possible to do overt observations, where the participants are aware that they are being observed, or covert observations, where participants are unaware. Within research, overt observations are far more common and this is what we discuss here. There are additional ethical issues to bear in mind when undertaking covert observations.

Observations can be structured – for example you may record the number of times a specific event or events happen during a lesson – or they can be very open. The observer can participate in the event being observed (this is known as being a 'participant observer') – for example a teacher might observe how learners are engaging with a task within their own classroom. Alternatively, observers can take no active role (being a non-participant observer). In these cases, the observer will sit at the back of the room or out of the way to make notes. Where appropriate, researchers can video record the session they are observing for review at a later date.

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Depending on your research, it may be appropriate to carry out a focus group with participants with dissimilar characteristics. However, it often helps the flow of the conversation and the group dynamics if the group shares key characteristics, as everyone is more likely to feel at ease.

2.4 Surveys

Often the terms 'survey' and 'questionnaire' are used inter-changeably. Surveys are a systematic way of collecting information from individuals and groups, whereas a questionnaire is a set of questions that you ask respondents. Surveys can be self-completed (i.e. the respondent completes the questionnaire individually) or an interviewer can ask respondents the questions. In the latter example, the questions should be asked in exactly the same order and way for all respondents.

Surveys can include questionnaires, face-to-face interviews and can also include observations of people and events (for example how learners use the dining facilities or a library). Surveys are the main method used in quantitative research. They provide an efficient way of collecting views and information from a wide range and large number of people.

Questionnaires can be paper-based or administered via online survey software programmes, such as NFER School Surveys (www.nfer.ac.uk/pps) or Survey Monkey. Using online survey software offers several advantages over paper surveys. These include having no postage costs and the researcher not needing to invest time entering the data manually. Online survey software can also do some of the analysis for you, creating tables of data, for example.

Surveys can include questions of different types and formats. These are presented in Figure 4.

Figure 4 Different types of survey questions

Closed questions (single response) These offer a restricted number of pre-defined responses (e.g. please select one answer only)

Open questions These questions ask the respondent to write an answer (e.g. 'Where do you work?' or 'How do you think SEN support in school could be improved?

Question types Multiple choice questions These offer the respondent more than one option to choose (e.g. please select all that apply).

Likert scale questions These offer a choice of pre-defined responses on a continuum (e.g. a scale from strongly agree to strongly disagree). Ranges questions These ask the respondent to indicate which category they fall within (e.g. age group; 0-10; -11-20 etc).

2.5 Quasi-experimental

With a scientific experiment, it can be easy to identify cause and effect. For example, in a laboratory with inanimate objects it is possible to run an experiment several times, each time changing one variable and keeping all the other variables the same. If a change is identified, you can then be confident that the effect you are seeing is a result of the variable you changed. It is not possible to do this in social science research where you are dealing with people. It is hard to control for all the variables, to say nothing of the ethics involved. Instead there are a group of related techniques, referred to as quasi-experimental, which you can use.

The most common quasi-experimental approaches compare two groups. This method is particularly useful if you want to explore the effect of some sort of intervention, perhaps a new teaching method. You assign learners to one of two groups:

- an 'experimental group' (sometimes called intervention or treatment group) which will receive the intervention.
- the 'control group', who do not receive the intervention.

You will need to test the two groups before (pre-test) and at the end of the intervention (post-test) and compare the change in the scores of the groups. For example, to test whether a numeracy support intervention for Year 5 learners supports improved outcomes you could carry out quasi-experimental research. The experimental group will be given the intervention (for example, a one-to-one teaching session per week for 20 weeks). The control group will not be given the intervention. Both groups' numeracy test scores will be assessed and compared at the start (pre-test) and end of the 20-week period (post-test). All other factors would remain the same, for example, the learners in both groups would still receive normal numeracy class teaching and would sit the same pre- and post-test at the same time under the same conditions.

As far as possible the control and experimental groups should have the same characteristics; with the only difference between the two groups being that one had the intervention and the other did not. For example; they should be the same age, the same socio-economic status and the same gender mix. Ideally learners would be randomly assigned to the control and experimental groups. This is what happens in 'Randomised Controlled Trials' (RCTs). The NFER book, '*A guide to running randomised controlled trials for educational researchers*' is available from www.nfer.ac.uk/ris.These are trials of particular interventions which can indicate causality – whether the intervention is actually causing the change you are interested in.

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Randomly assigning learners to groups is not always possible however, particularly within a school setting. Some people struggle with the ethics of giving some learners access to additional support and others none. This concern is unfounded as we do not know whether an intervention works at the point of trial and therefore it is not unethical. But, one way to overcome this concern is by offering the learners in the control group the intervention once the experiment (or research) has finished, so that all learners involved in the research will be given the intervention at some point. Offering this also often helps to reassure parents about the research, and can be an important factor in them giving consent for their children to be involved in the research.

3 Designing your research instruments

A research instrument is the tool you use to collect your data. In other words, this is your interview schedule (or set of questions), your questionnaire, or your observation schedule. Designing a good research instrument that will give you the data you want may not be as straightforward as you think. It can be guite time consuming. Ideally, you would test out or pilot your research instruments before using them for your research. This helps to ensure that your questions are understood in the way you intended and that you have suitable response options (for guestionnaires) or appropriate follow-up guestions or prompts (for interviews). Time and resources mean that piloting is not always possible, however. Table 1, on page 14, summarises the strengths and weaknesses of each research method.

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4 Who is going to be involved in your research and how are you going to decide?

There are various ways to decide who will be involved in your research. This will be determined by your research topic to some extent. However, it is important that your decisions about who you will invite to participate in your research are made explicit, so others know about any potential limitations of your data.

In quantitative research, the choices you make will determine the extent to which the findings can be generalised (remember, findings from qualitative research are not intended to be generalised). The process of choosing who will be invited to participate in your research is called 'sampling'. It is often not practical to send a questionnaire to everyone, so we select which group/s of people we want to be involved in our research ('a sample'). The idea is that your sample is representative of your population. For example, there is not usually a need to engage the whole school in your research - not least because this could be costly and time consuming – instead you could choose to access learners from a particular class/es or year group/s. Taking this example, the whole school would be what we call the 'population' and the sample would be the class or year group you select to participate in the research. In other instances, your overall population might be the year group or class. Your sample would then be the

group of learners that you select from that year group or class to take part in the research.

We have outlined some sampling approaches below. Choosing a sampling approach will be defined to some extent by your research question. The first three approaches tend to be used with **qualitative** research methods and the remaining with **quantitative** methods.

Purposive sampling: Here you choose respondents because they have a particular characteristic that you are interested in, for example, gifted and talented learners.

Snowball sampling: Here you ask one person (or participant) to put you in contact with another(s). For example, you may ask a Year 11 learner to put you in contact with his/her parent/carer and invite him/her to be part of the research; that parent/carer may then suggest another parent/carer for you to approach and the process continues.

Convenience sampling: Here you identify people who are available. They may or may not have the characteristics you are interested in. This approach may not be desirable but that will be determined by your research question.

Simple random sampling: This approach means that every person in a given population (e.g. a school or class) has an equal chance of being selected because each participant is selected at random. When this robust

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approach is adopted, the findings can sometimes be generalised to the whole population.

Quota sampling: This approach ensures that the sample includes a certain proportion of respondents from particular group/s, even if that proportion does not reflect their prevalence in the population as a whole. For example, you may be particularly interested in a particular ethnic group and stipulate that the sample should contain a certain percentage of participants from specific ethnic groups.

Stratified sampling: With this approach, the population is split into groups (or strata). For example, schools might be stratified based on their proportion of learners who are eligible for free school meals. Within each group you will randomly select a sample.

Cluster sampling: Here the whole population is divided into smaller groups and then a number of those groups are chosen. Within each group, the population is randomly sampled. For example, ten schools (or classes) might be invited to participate in the research but you would administer the survey to a random sample of students within each of those schools or classes.

5 The technical bit

When undertaking research, there are a few other terms you will need to be aware of and, if possible, consider in relation to your project. We briefly introduce each concept in the figure below.

Figure 5 Common research terms

Validity

This tests whether you are actually measuring what you say you are measuring. This is generally applicable to quantitative research but can be applied to qualitative research too.

Bias

There is always an element of bias in social research, but researchers must try to be objective. As far as possible you should acknowledge your underlying views and assumptions and try to mitigate against these - for example, by looking for evidence that disproves your own view.

Reliability

This is an assessment of whether you would get the same results if you (or someone else) repeated the research with the same group of respondents in the future.

Triangulation

Triangulation involves collecting and analysing data from different sources (be these stakeholder groups, test scores or other information) and seeing the extent to which they match. The more the views coincide, the greater the confidence you can have in what you are being told or what appears to be happening. It is also informative when data sources do not coincide, as this can lead to new understandings.

6 Analysing qualitative and quantitative data

You need to think about your analysis when you plan your research. The questions you ask and how you ask them will determine what analysis you can do.

6.1 Analysing qualitative data

There are many approaches you could use to analyse qualitative data. There is a process to follow regardless of which you choose (see Figure 6).

Figure 6 Qualitative data analysis process

6.1.1 Organising the data

You need to revisit the purpose and aims of your research and then decide how to structure your analysis. To start this process, you need to organise it so you have all your data together. If you have done observations in different classes, you will want to collate your notes for each class observation together. You will also need to read through all of your data and familiarise yourself with it before moving on.

6.1.2 Reducing the data

The main technique employed here is 'coding'. You can buy software packages to help you code qualitative data, but these may not be worth the investment for a small dataset.

The purpose of coding is to apply themes and subthemes to the data. You are aiming to organise the data into manageable 'chunks' so that you can compare relevant responses. The interview notes will contain lots of interesting data, but not all of it will be relevant to your research question; this stage helps to filter out any irrelevant information you have collected. The figure on page 11 shows a process for coding interview data.

It may be that, as you go through the interviews, more codes emerge. This is not a problem, just go back over the interview notes you have already coded and add in the new code. **Remember, only code what is useful to the research!**

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Figure 7 Coding interview data

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Start by making a list of the particular things that you are interested in and give each one a name – these become your code labels. Alternatively or as well, you may assign each code a colour.

Select a code label and go through the interview notes (or transcript) and mark every time it occurs. How you do this is up to you - some people use hard copies, others do it on screen. Repeat this step with the other codes.

Repeat step two with all the interview notes.

6.1.3 Displaying the data

The purpose of this phase is to group your data using the themes. You can do this by using mind-maps or spider diagrams; highlighting and colour coding the data (e.g. one colour per theme); cutting up the data and sorting it so all responses relevant to one theme are together; or using 'cut and paste' and highlighting in word processing software. When doing this, you need to ensure each piece of data has its identifier code, otherwise you will not know who has said what.

6.1.4 Developing conclusions

This is where you assess what the data is telling you. You can do this by theme, sub-theme and/or between cases (for example, looking at differences between practice in two classes). All of your conclusions must be firmly and transparently based in the data – beware of bias!

Notes

6.2 Analysing quantitative research

With quantitative research, you will need to design your instrument with your analysis in mind. As well as the questions you ask and how you will ask them, you need to think about how you will compare the data. For example, if you want to analyse the differences in responses between boys and girls, different ethnic groups or year groups, you need to ensure you have this background information

6.2.1 Useful terminology

Before going into more detail about the analysis, there is some terminology which it is useful to define.

You will often hear people talk about variables; these are defined below:

- A variable is simply something that can change.
- An independent variable is identified as the element that causes the effect.
- A dependent variable can be thought of as an 'outcome', and this is what is affected by changes in the independent variable.

For example, if you are studying how gender affects Key Stage 2 literacy scores the independent variable (i.e. what is thought to cause the effect) is gender and the dependent variable (what is affected) is the Key Stage 2 literacy score. With quantitative research, there are also different types of data. These are outlined below:

Continuous: This is where it is possible to get every number on a scale so it is continuous. For example, an examination score could be anywhere between 0 and 100.

Categorical: This is where the data you collect can only have certain values; the data may not be numerical either. For example, categorical data would be a scale such as 'strongly agree', 'agree', 'neither agree nor disagree', 'disagree' and 'strongly disagree', or where respondents have to select where they fall within a range (or category) (such as age range, i.e. 12-15; 16-18; 18+ etc.).

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6.2.2. Entering your data

Once you have collected your data, you will need to enter it into some sort of spreadsheet or statistical package. To enter your data, follow this process.

- Give each respondent a unique identifying number (UIN); if you are carrying out your research in several classes or schools, you may want to give each class or school its own UIN as well.
- If the data is continuous, just enter the value, for example a test score of 66 per cent.
- If the data is categorical, you will need to code it. This means that you will assign a number to a particular response option and enter the number into your spreadsheet ready for analysis. For example, if you have asked what subject the respondent teaches, you would assign a number to each possible response (i.e. chemistry=1; biology=2 etc.). This makes analysis easier.

Once all the data has been entered, you can use basic statistical techniques to analyse it.

References

Aliaga, M., and Gunderson, B. (2000). *Interactive Statistics*. Saddle River, NJ: Prentice Hall. Cited in: Muijs,D. (2011). *Doing Quantitative Research in Education with SPSS*. Second edn. London: Sage.

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Useful resources

We hope that this short quide to running qualitative and quantitative research has whetted your appetite for carrying out your own research. NFER has published a series of 'How to' guides for practitioners who want to carry out their own research, helping you put your ideas into practice. NFER have research books and training days available as well as free guidance on topics to research and methods of research. Why not get recognition for your achievements in research in your school, college or early years setting by applying for the NFER **Research Mark? Visit** www.nfer.ac.uk/ris for more information.

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Table 1 Summary of research methods' strengths and weaknesses

This table summarises the strengths and weaknesses of each method.

Research method	Strengths and advantages	Weaknesses and disadvantages	Points to consider
Interviews Mainly used in qualitative research.	 Interviews can explore issues in depth. Questions can be modified during the interview to allow the interviewer to respond to the direction of the discussion and follow up any ambiguous responses. These may be suitable for exploring sensitive topics. Interviews gather data using the respondent's voice and language. 	 Interviews can be time consuming to conduct and to transcribe and analyse the data. Interviews are carried out with small samples. It can be easy for researcher bias to creep in. There is a need to ensure that the questions are unambiguous and do not lead the respondent. For example, saying 'The CPD on offer in this school is the best I have ever known; don't you agree?' may prompt the respondent to agree with you rather than tell you his/her own view. 	 How are you going to conduct the interviews (e.g. by phone, face-to-face, video-calling/webcam)? Where are you going to conduct the interviews? You will need a quiet place without interruptions. How will you record your data, e.g. will you audio- record; what sort of notes will you type up? Full transcriptions take time; it can take up to six times as long to type the notes as to conduct the interview. For most research, you can type less detailed notes, supported by transcriptions of quotations or examples. How will you abide by the legal requirements of protecting your participants' data (i.e. anonymity and confidentiality)?
Focus groups Mainly used in qualitative research.	 Focus groups can offer an efficient way of collecting a range of opinions from groups of people. Group dynamics can quickly highlight areas where there are consistent or opposing views; and which areas are important to the respondents. It helps to arrange focus groups if you can tap into pre-existing groups or committees. For example, you could ask the school council to stay for an hour after their meeting to attend your focus group. 	 The number of questions you can ask will be limited. The facilitator needs to manage the discussion so that all voices are heard. Power struggles can arise between participants. There may be resource and logistical implications if you need a facilitator and a note-taker. Focus groups usually last for longer than interviews and between one-and-a-half and two hours (depending on the topic area and age of participants). You will need to find a large enough room to accommodate your participants. You may need to provide drinks and snacks. Transcription and analysis can be complex and time consuming 	 You must ensure confidentiality and anonymity in a group situation. It is useful to set ground rules at the start of the focus group by asking the participants to sign up to a statement of confidentiality whereby everything said within the room will remain confidential to only those participants present. See the NFER 'How to Run focus groups: Get the most from them' available from www.nfer.ac.uk/ris

Run qualitative and quantitative research

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Research method	Strengths and advantages	Weaknesses and disadvantages	Points to consider
Observations Mainly used in qualitative research.	 Observations are very useful for finding out what is going on in a situation, such as a classroom, dining hall or playground. They are useful for accessing non- verbal data. They can provide an opportunity to record events or the frequency of specific incidents. 	 Observations can be time consuming to arrange, conduct, write up and analyse. There is a need to mitigate researcher bias, particularly in the case of participant observation. Be aware that the presence of another person in the setting can alter the way that people behave. 	 How are you going to record the observation? What will your role be; will you be a participant or non-participant? How will you record the data if you are a participant?
Surveys Mainly used in quantitative research, but can sometimes be used qualitatively.	 Surveys are useful for gathering views from a large and broad range of respondents. Surveys can be anonymous. Data between individuals and groups is easy to compare. Surveys collect specific information that can be counted and statistically analysed. 	 Data entry can be time consuming for paper-based questionnaires. Response rates can be low; typically between 20 and 40 per cent for postal and online surveys, so you may need a large sample to get your desired number of participants. With parents, response rates can be as low as 10 to 20 per cent. There is no chance for following-up or exploring ambiguous responses, or probing the reason behind a specific response. Questions can be misinterpreted by the participant (piloting can help mitigate this). 	 Where and when (if at all) will you pilot the questionnaire? How will the survey be administered – by post, in person, online, by text message? How will you remind participants who have not responded to complete the survey by your specified date? How will you decide on the sample to be surveyed? How will you obtain the contact details for postal/ online surveys?
Quasi- experimental	 Quasi-experimental research is useful for gathering information on whether something is having an effect (or impact) as it collects data from comparable control and experimental groups. It can provide robust evidence. 	It can be difficult to obtain comparable groups	 How are you going to assign the control and experimental groups? There are a number of ethical considerations; if the intervention has a positive effect then is the control group at a disadvantage? How will you mitigate this?

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Evidence for Excellence in Education

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Use focus groups – get the most from them

2

This short guide provides an introduction to focus groups for senior leaders, teaching staff and other school staff who are interested in carrying out research, with a view to improving practice.

What are focus groups?

Focus groups are group interviews focused on

specific topics. They are useful for brainstorming ideas and finding out what groups of people think. They can be used with learners, parents/carers, the community, school staff, governors and others.

Focus groups work well when:

- you need to find out people's opinions about a limited number of topics
- you need to consult a range of different people
- you are making important decisions which need to be shaped by key stakeholders
- you want to use the group dynamic to develop new ideas which may not be possible through one-to-one interviews or other research methods
- you want to gather the views of a range of people involved in a programme or intervention.

Focus groups work less well when:

- you need to explore confidential or sensitive matters
- you need to research a wide range of topics and/or consult a lot of people

- answers are needed very quickly, as focus groups can take time to set up
- you need to involve young children (e.g. learners in early years and reception).

Why do focus groups?

Focus groups tend to appeal to schools because:

- they are relatively easy and cheap to set up within a school setting
- participants often enjoy focus groups because they feel empowered and can discuss things in their own words whilst 'bouncing ideas off' others in the group
- people with literacy, learning or other difficulties¹ can participate fully in focus groups whereas they may be less able to complete written exercises, like surveys
- they generate a lot of useful data from different people at the same time
- group dynamics can naturally help to identify a consensus and to focus on the most important topics
- they can help you to understand people's views and experiences.

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Careful considerations may need to be made when doing focus groups with people with learning difficulties however to ensure they are able to fully participate.

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What do focus groups involve?

Focus groups involve five main steps: developing the questions you want to ask; identifying the sample (your participants); conducting the group; drawing together and analysing the data; and reporting the findings.

As early as possible in this process, you should decide how you will ensure your project is ethical. (See www.nfer.ac.uk/ris for further information on ethics).

Figure 1 sets out the five steps in planning and implementing focus groups.

Steps in conducting focus groups

Looking at each of the main steps in turn, we outline the key activities you will need to carry out. We also include some aspects for you to consider at each step.

Step 1: Develop your questions

The questions should:

- be preceded by a short introduction which outlines who you are, the purpose of the focus group, and how the data will be used (e.g. to inform a new policy or improve practice)
- start off with an 'ice-breaker', e.g. 'tell us one thing about your school which you enjoy', or, 'please introduce yourself, telling us what school you are from and what year group you teach'
- be more general at first, and then become more specific, ending in a 'review' question which summarises the main points discussed (e.g. 'what are the most important points we have discussed today?', or 'what have you found out about [the topic] today?'
- be clear, concise and logically ordered.
- be no more than five to 10 in number for a focus group lasting one to one and a half hours. Within a school setting, you are unlikely to want to carry out focus groups with children and young people for longer than one hour.
- elicit a detailed response and not one word answers. You should ask 'open' questions (e.g. what, how, why and where questions) rather than 'closed' questions which will gain a short, 'yes' or 'no' answer. Possible examples are: 'What do you like about the gardening club?' rather than 'Do you like the gardening club?'.

Figure 1

Step 2: Identify your sample²

Your focus group should:

- ideally involve between 6-10 people. It is possible to run a focus group with four people but the scope of the discussion will be more limited than that with a larger group. It is unadvisable to run a focus group with more than 10 people.
- include all of the 'right' people who understand and can talk in depth about the topic(s).
- include people of a similar status or background to encourage free and uninhibited discussion e.g. it is unlikely you would want to do a focus group with new year 7 learners and year 11 learners at the same time. You would choose to do a group of year 7/8 learners and a separate group of year 10/11 learners.

Considerations:

 Depending on who you are doing your research with, you can invite people to take part in a number of ways. For example, for parents or staff, you may choose email, telephone or by post. A combination of these is often more effective. For learners, putting up posters or talking about the research in assembly may be more effective.

- Allow enough time to contact and re-contact people. This is applicable to most research methods, not just focus groups. You will need to allow more time for this with parents/carers than you would with staff or learners.
- Contact more people than you need to take part. Some parents/carers, for example, may be unwilling to participate in your research; or some staff may be unavailable. It is good practice to draw up a 'reserve list', especially for parents/carers.
- Bear in mind that when you invite parents/carers, learners, staff or others to be involved in your research, it is a good idea to provide them with information about how they can contact you. They may have questions about the research which they want answering before they are prepared to commit.
- As with any event in a school, you will need to ensure you have considered access issues and/or any special requirements potential participants may have.
- Bear in mind the time of day you will run your focus group. For example, staff and some parents may be unlikely to participate during the day, however, they may also find it difficult (or unwilling) to in the evening or at weekends. Lunchtimes or immediately before or after school may be suitable times.

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A sample is a subset of people selected from an overall population, or group, to be involved in your research. For example, if you wanted to ask Year 10 learners how they found the process of choosing their optional subject, you would select a subset (or sample) of these and invite them to participate in a focus group.

Step 3: Conducting your group

Considerations:

Managing your focus group:

- You will need an impartial and experienced person (known as the 'moderator') to lead the group. The moderator should explain the purpose of the group, ask the questions, keep the participants on track and on time, invite all participants to contribute and summarise the discussion at key points.
- Ideally, the moderator should be supported by someone else (the 'assistant'). The assistant helps the group to run smoothly by welcoming participants, taking notes (including noting down who is speaking), offering refreshments, helping with time keeping, and supporting the moderator.
- As people become more experienced at running focus groups, it is possible to moderate alone. In these circumstances, it is advisable to audio record the discussion (only with all participants' permission).

The venue and participants:

- The venue should be neutral, convenient for participants and comfortable. *Before* participants arrive make seating arrangements accordingly, as shown in Figure 2.
- Try to make participants feel at ease. Welcome them

upon arrival and provide refreshments where possible. Use this time to chat informally and use this interaction to check whether they are likely to be shy or dominant.

 Make name cards or name badges for each participant. Ask them to write their name on them and place them on the desk in front of them. This will not only help the moderator but also the other participants, especially if they do not know one another.

Figure 2: Focus group seating plan

Step 4: Draw together and analyse your data

- When you have completed your focus group, listen to the recording and check the assistant's notes against it for accuracy.
- Group the data under the questions asked and draw out the key points.
- Think about what the data is telling you about the topics discussed. It may help to talk through your interpretation with the moderator and / or assistant.
- For further information about data analysis, see www.nfer.ac.uk/ris.

Step 5: Report your findings

- Plan carefully before you start writing your report. Consider who the audience(s) will be. You may need to create more than one version of a document for different audiences (for example, the messages you pull out for staff may be very different than those you want to target at parents/carers or pupils). Also, think about format – would a presentation or video report be more effective than a printed report?
- Structure your report clearly, using headings, subheadings and summaries where needed.
- Include an introduction at the start of the report which states the purpose of the document and

makes the reader want to read on. Summarise your findings into a short conclusion section at the end.

- Use the active voice, e.g. 'I found', 'we investigated', which helps to aim your report directly at the reader.
- Use 'plain English', avoiding jargon and abbreviations.
- Write in short, clear sentences.
- Ensure your report is not too long, people will not read a lengthy document. If your report is long, it is advisable to write a short summary at the start.
- Consider using diagrams or figures to set out complicated information.

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Resource considerations

While focus groups enable researchers to collect information from a range of people in one sitting, there are some resource implications. These include:

- The time it can take to identify possible participants and to contact (and re-contact) them.
- The time it can take to type up your focus group notes (this can take up to ten times as long as the focus group meeting for a full transcription, although it is usually less).
- You need to consider whether you will have a moderator and assistant for each focus group. Bear in mind that if you do not have an assistant, and your participants do not want you to record your focus group, the quality of your notes are likely to be of poorer quality.
- The equipment you will need includes a quiet room of suitable size, chairs and possibly a table, audio recording equipment and refreshments (optional).

Sharing your research

You could share your research in the following ways:

- giving presentations to pupils, teachers, governors and parents
- writing an article for the school newsletter and/or colleagues in other schools

- writing for a practitioner journal or trade press
- send your report to your focus group participants (it is good practice to do so)
- writing an entry for an online publication, e.g. a blog or website.

Further information is available from NFER's 'How to' guides at www.nfer.ac.uk/ris.

Research ideas

Here are some ideas for how you could use focus groups in the school setting.

- Generating ideas for how the school can become more eco-friendly in future.
- Gathering governor, staff, parent/carer and/or learner opinions on how well a new policy (e.g. admissions, inclusion) is working.
- Getting feedback on what the community wants from a new school e.g. buildings; outreach; courses; leisure facilities; access to wider support services.
- Identifying what issues affect the transition from primary to secondary school and how the school (and its feeder schools) can address them.
- Generating solutions to promote communication between the school and home environments.

 Exploring the accessibility of new classroom materials for learners with special educational needs (SEN) and additional learning needs (ALN).

Other useful resources

We hope that this short guide to using focus groups has whetted your appetite for carrying out vour own research. NFER has published a series of 'How to' guides for practitioners who want to carry out their own research, helping you put your ideas into practice. NFER have research books and training days available as well as free quidance on topics to research and methods of research. Why not get recognition for your achievements in research in your school, college or early years setting by applying for the NFER **Research Mark? Visit** www.nfer.ac.uk/ris for more information.

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Evidence for Excellence in Education

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'How to' Guides

This short guide provides an introduction to writing up your research. It will take you through some of the main questions and concerns you might have and provide you with tips to get you started on your report. This guide does not cover other ways of presenting your research findings (such as presentations) although many of the same principles apply. It aims to help senior leaders, teachers and other school staff who are thinking about undertaking research.

The first thing to decide is whether you need to write a research report at all. It may be that your findings lend themselves to other ways of presenting and sharing the messages from the research. These could include a short summary paper that outlines the main messages for key stakeholder groups; a presentation that identifies the key messages that you can talk through with your peers; a blog; or a video report. You could, of course, produce a combination of these things to ensure your research is accessed by the widest number of stakeholders.

1 When should I start to write?

It is never too early to start writing your research report. In our *How to plan your research guide* (see www.nfer.ac.uk/ris), we recommend that during the planning phase you think about your research output(s) and who your audiences are. This will make writing your report easier at the end.

You can start to write sections for your report throughout your research project. For example, you could write your introduction and some of your methodology sections quite early on – these do not need to wait until the end. Anything you can do earlier will save you time later. Draft sections can always be amended and updated at a later stage.

Some people will do their analysis and report writing concurrently. We recommend, however, that you complete your analysis *before* you start writing about the findings. Having completed all your analysis, you will know what the data is telling you and will have a good idea about how you want to present these messages. Completing your analysis will also give you some time for reflection and *planning* of your report. Investing time in planning your report will save you time and rewriting later. It will also help you to produce a more succinct, well-structured, well-written output.

Writing is not a fast process. Sometimes you will feel like you are not getting very far. Having a plan that breaks the writing down into manageable chunks, will support you through moments of writer's block and make the overall task seem less daunting. While you write, you will need to revise and rewrite what you have written, maybe several times. Some sections may only need one or two revisions whereas you may need to rewrite others many times before you get it right.

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2 What should a research report contain?

This very much depends on *who* the final document is for and what you agreed to produce at the outset. If your research is comissioned by someone else, for example, they may require a written report with specific areas they want covered. If you have designed your own research, there is no fixed format that your report has to take. Nevertheless, all research reports tend to cover some common areas. These are given below.

Title: This should give the reader an idea of what the research is about. A snappy or imaginative title often helps to engage readers.

Introduction: This should introduce the research and explain what it is about. In particular it should:

- tell the reader what the aims and purpose of the research are
- outline your research questions
- briefly explain what methodological approach you undertook (for example; quantitative, qualitative, mixed methods, action research).

You may choose to tell the reader why you are interested in this topic or give some background to the research (particularly if you have not done a literature review).

Summary of the literature and/or policy context (optional): It is a good idea to situate your research within the context of other research or current policy. For larger scale studies, you may well have carried out a literature review, which you could summarise here. For a short research project, this section may be quite brief. If possible, it should include:

- what is already known about the subject you are interested in (if it is a big topic then only include things which are directly relevant)
- where the gaps in the previous research are, which your research might help to fill.

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Methodology: It is important to provide some information about your research methodology. This will help others to understand your project, its level of robustness or any limitations, and how they could go about replicating your research.

The methodology section should give details about:

- how the research has been conducted
- what methods were chosen and why
- who the respondents were; how many there were; why and how they were chosen.

Ensure you do not identify anyone in this section or elsewhere in your report. Even where you do not name someone, you could inadvertently identify someone if you give too much information. For example, saying something like: 'One participant, who had been at the school for fifteen years, said they were happy and excited about the future changes to the ICT curriculum' could make it easy for people to work out who said this.

You may also want to include information about:

- any problems you encountered during the research and how this affected the project
- how far what you have found can be applied to other situations, for example; is the finding only going to apply to your school or is it also likely to be of use in others too?

Increasingly research report authors are putting a brief overview of their methodology in the main body of the report and a more detailed version in the appendix. This can help to keep the report shorter and help the reader to get to the findings sooner. Furthermore, not everyone is interested in hearing about the methodology in detail. You will need to decide what suits your audience best.

Key findings: This is the main section of your report. Here you will present your data and the research findings. Often this section is split into sub-sections, which are driven by your data analysis. So if your analysis uncovered different themes, you might choose to devote a sub-section to each of these.

It will help your readers to get the most from the report if you think about how to present the data in an interesting way.

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If you have conducted a survey and/or collected numerical data, you may want to include charts, graphs and/ or tables to make the data easier to gets to grips with (see page 8 for guidance on how to present and reference them). These can then be supported by a discussion of the findings. If your research was qualitative, you may want to include case study examples, quotes or vignettes,¹ to bring your findings to life.

Recommendations: Based on your research findings, it is useful to offer recommendations for improvements. Your recommendations *must* be grounded in your findings. Some of these may come from what your research participants have suggested and others might come from your own analysis. You could offer general, overarching recommendations or you may choose to target different recommendations at different stakeholder groups. Your recommendations could be quite small-scale and very practical; others may be more substantial. Depending on your audiences you may need to be careful how you phrase some recommendations, to avoid being too prescriptive. Using the phrase 'might like to consider' is often useful. For example rather than saying, 'The headteacher needs to invest more in staff training' you could say: 'The headteacher might like to consider investing in staff training, as this may help to overcome the current gaps in knowledge around ICT.'

Conclusion: The concluding chapter or section is often a summary of the findings, supported by the **author's concluding remarks.** It is generally quite brief. Conclusions sometimes suggest areas where further research is needed.

There are many different ways of structuring reports. For example, sometimes the sections above will be merged together, or one section could just be a short paragraph. Thinking about what information will be of most interest to your audience, and what they are most likely to read is key to deciding what your report will be like. At the end of the day, most people are interested in your findings and recommendations, so give most space or time to covering these.

If you are not writing a formal research report, you will still need to address most of the areas listed above in your presentation or summary, but in less detail.

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Vignettes are short descriptions or scenarios which illustrate a point that you are making and can help the reader to understand the context.

3 Writing up your data (your research findings)

How you write up your data will depend on what data you have collected. We offer some suggestions and tips for writing up qualitative and quantitative findings.

3.1 Qualitative data

If you have collected *qualitative data* (data which is not based on numbers) then you will probably have analysed the data using codes and sub-codes,² pulled together under broader themes (see 'How to run qualitative and quantitative research'). Having these broad themes and sub-themes helps to provide a logical way to write up your data. Each broad theme can form a section heading and sub-codes (or sub themes) can become subsections (see example below).

Example	
Theme 2.	What worked well about the intervention?
Sub theme 1	2.1 Parental engagement
Sub theme 2	2.2 Timing of the intervention
Sub theme 3	2.3 Support and training given to staff

Alternatives to splitting your data by theme, are to divide it by stakeholder, location or setting. For example, if you did your research in two different schools, you may want to write about each separately, pulling together areas of commonality or difference at the end of your report. Alternatively, if you asked a number of stakeholder groups about the same topic, you may want to present what governors told you in one section, what teachers said in another and what learners contributed in a third section.

Your research may lend itself to a *case study* approach. For example, if you have carried out an observation of different classes within your school, you may want to write a summary of each case (or class) in a different section.

However you decide to write up the data, if you have collected interview data, you will probably want to include *quotes*. These help to break up the report and to 'bring it alive'. Short quotes can also help to illustrate a key point well. Make sure you include some indication of who has said it (e.g. was it a teacher or parent?). Remember that the person and the location should be anonymised (unless you have participants' agreement to name them). Example of anonymising your data

A science teacher explained:

I only let the pupils undertake practical work in my lessons when I have the support of the classroom assistant.

If you feel the term 'science teacher' may identify the participant, just use the term 'teacher'.

If you have collected data from observations then you may want to include vignettes.

Tables: These are used when you want to present numerical data so that you can easily see the number or percentage of people giving a certain response. The numbers in the tables can either be given as percentages or as a frequency (the actual numbers of people responding). If you are using frequencies then somewhere you should also include the total number of people who responded.

When designing a table you need to think about how you set out your data, in particular which is the easiest way for people to read the data? In the example below it made more sense to put the questions down the side and the response categories across the top.

Table 1. Number of students intending to study AS or A level mathematics and science subjects prior to attending the careers workshop.

Before attending the careers workshop to what extent do you agree that you were intending to	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
study biology at AS or A-level?	23	14	7	5	0	49
study chemistry at AS or A-level?	17	14	9	9	0	49
study physics at AS or A-level?	26	15	5	3	0	49
study mathematics at AS or A-level?	16	14	6	13	0	49

A total of 49 respondents Source: School survey 2013 Tables are useful if you want make comparisons or include lists. Diagrams can help to illustrate processes and show how different ideas and aspects link together (see example opposite).

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Example: Summary of key messages by stakeholder group

Source: Easton, C., Martin, K. and Walker, F. (2012). The Impact of Safeguarding Children Peer Reviews (LGA Research Report). Slough: NFER. Available online: http://www.nfer.ac.uk/nfer/publications/LGIS01/LGIS01.pdf [Accessed: 15th September, 2013]

Provide information about

3.2 Quantitative data

Writing up **quantitative data** (data which uses numbers) can be more straightforward than writing up more narrative, qualitative data. As well as text you can use a variety of charts, diagrams, tables and graphs to make the data easier to understand. Software, such as spreadsheets, will produce these for you at the click of a mouse. Make sure that what you use is appropriate to the data though; charts or grids can sometimes lead readers to misinterpret data through their layout, rather than aiding understanding.

When using charts, diagrams, tables and graphs ensure that they all have a title and display the axes (or key) and numbers of respondents.

Some examples of charts and graphs are shown here.

Pie charts: These can show the proportion of respondents in each category.

Figure 1.1 Number of courses attended by percentage of staff at School A in 2013

Bar charts: These can be used to show the number of responses in each category. They can also be used to illustrate the range of responses, for example in a 'Likert-scale question' or to show how responses from different groups of respondents compare.

N=81

Source: School survey 2013

Likert scales and Likert type

questions: These are questions which are designed to measure attitudes and opinions by asking people to respond to a series of statements about a topic, in terms of the extent to which they agree or disagree with them. The bar chart in figure 1.3 shows boys' and girls' responses to the Likert-scale question: *How much do you agree with this statement: I feel confident in using graphs in my science lessons?*

N=121

Source: NFER online student survey 2013

Histograms: You can also present your data using histograms or line graphs. Histograms are used to represent the distribution of continuous data (i.e. data that can take any value and is measured rather than counted; such as age or height). Histograms look like bar charts, except that in bar charts the bars are spaced, whereas in histograms they touch.

Line graphs: These should only be used when you are displaying continuous data on *both* the *x* and *y* axes. In the example below, the line charts shows how learners' mathematics scores relate to their test scores in chemistry (see Figure 1.4 below).

Figure 1.4 Mathematics test score against chemistry test score

Source: School survey 2013

4 Writing tips

Many people, including experienced researchers, can find starting to write quite daunting. Writing style is personal and, as with anything, develops the more you do it. Some people plan in detail before they write, others find that their ideas flow better if they sit down and just write. Below are a few ideas and tips that people have found helpful.

- Put aside a period of time each day or week for writing (and stick to it!).
- Use a spider diagram to capture your thoughts and the main themes coming out of your analysis, before you begin writing.
- Read! Looking at other people's research reports can give you ideas for your own. There are many to choose from on the NFER website (www.nfer.ac.uk).
- In the early drafts, do not worry if you cannot think of the appropriate word to use, just put something similar. You can highlight these places and return to them later. What is important is that you keep the flow of what you are trying to say going.
- Be aware that some days you feel able to tackle the difficult sections and other days you can only cope with straightforward tasks; do what suits you.
- When you get a mental block, stop writing. Come back to it later when you feel more able.

 Talk to friends, family, colleagues about your writing. In trying to explain the findings to them you will often clarify your own thoughts.

Other useful resources

We hope that this short guide to writing up your research has whetted your appetite for carrying out your own research. NFER has published a series of 'How to' guides for practitioners who want to carry out their own research, helping you put your ideas into practice. NFER have research books and training days available, as well as free guidance on topics to research and methods of research. Why not get recognition for your achievements in research in your school, college or early years setting by applying for the NFER **Research Mark? Visit** www.nfer.ac.uk/ris for more information.

'How to' guides collection – This is a collection of these five 'How to' guides

'How to' Guides

The NFER 'How to' guides are a quick and easy way to digest different aspects of research.

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This guide was published in 2013 and was correct at the time of publication. Users are encouraged to check for the latest advice on data protection with the provisions of the General Data Protection Regulation. For further information please visit the ICO website.

