west lothian council psychological services

research guidelines

WEST LOTHIAN COUNCIL DELIVERS...

A High Quality Service

West Lothian Council

Education & Cultural Services

Contents

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introduction

Psychological Services in West Lothian play an active part in providing advice and guidance to schools on how to help children learn more effectively. This advice is based on evidence about what is currently known to work best in promoting learning and why.

A lot of this research about what helps in classrooms has come from classroom-based studies, often carried out by teachers.

For example, we know that if a child tries to explain their understanding of something to another child, they are much more likely to really learn and recall this knowledge over the long term than if the same information was told to them by an adult.

West Lothian Council has recently launched Succeeding Together, an initiative aiming to raise attainment and achievement for all pupils through classroom-based action-learning enquiries. The Council is aiming that all WL schools will be engaged in this initiative from August 2004.

This booklet provides guidance on how teachers can go about setting up and evaluating such action-learning enquiries in classrooms in order to promote effective learning.

Why do your own research?

In the current climate of quality assurance we are all encouraged, if not actively expected, to provide evidence that what we do is best practice. Every day teachers are engaged in trying to improve the teaching and learning experiences of all the children in their classroom. They want to know what helps and what does not, and why.

Teachers try out new things all the time. They get ideas from colleagues, from books and other resources. But how does a teacher or manager:

- choose what approaches to use?
- judge what makes a difference in her classroom?
- know if a new approach to, for example, teaching maths has been beneficial?
- find out what is actually happening in the classroom and plan suitable interventions?

It is by doing research that a teacher can start to answer some of these questions. Teachers are in an excellent position to gather evidence about what works in classrooms, to test out whether theories and approaches in relation to teaching and learning are valid, and to add a wealth of useful information to the body of knowledge held by the teaching profession.

What is research?

Research involves systematic enquiry. While research has traditionally been carried out in very controlled conditions, such as a laboratory setting, the type of research that happens in schools tends to be of a 'real world' variety that allows for the complexity and messiness of real life while still maintaining a systematic framework of enquiry. To evaluate current practice (perhaps a new reading scheme), and discover how it or our teaching might be improved, we need to set up an 'action learning inquiry'. In 'Succeeding Together', action-learning inquiry is defined as 'focusing on children's learning needs, investigating why some children are not learning as well as they might, and devising and implementing new and improved approaches' (p6).

An Action Learning inquiry focuses on children's learning needs. It can be used to investigate why some children are not learning and implementing new approaches to learning.

The time factor

While it is always difficult to find the time for something new, research can be constructed around everyday classroom practice and can be seen as part of the evaluation process.

Example 1:
While marking written work, Mrs Macmillan realises that a number of her pupils are not developing their ability to give vivid detail in their writing, and also notices that their work lacks personal development. Further analysis highlights poverty of vocabulary used. Using a sliding scale, the teacher asks the children to rank how much they enjoy writing, and a low average is obtained. She has a hunch: she asks the pupils why people write, and discovers they cannot easily identify purposes for writing.

This is an example of an exploratory stage of research within a classroom setting. The teacher's observations of class work led to two initial research questions: '*What kind of vocabulary are the children using?'* and *'Do they enjoy writing?'* The results led her to a further question: *'do they think writing is important – and important for them?'* This teacher has now highlighted a number of areas of weakness which she wishes to improve. She will now read, seek advice and perhaps training, to enable her to devise a programme or approach that will help improve skill levels and engagement. She has developed easy to use tools to measure progress – class work and a pupil questionnaire. She may also go on to use length of written work or time on task for some target pupils as a further baseline.

Research questions need to be clear. Are your questions specific enough? Can you devise appropriate tools to assess change

As long as we are clear about our research question, and know exactly what type of information we need to collect and how, doing a piece of classroom research need not be too time consuming.

getting started

There may be an area of teaching practice, or an intervention strategy that particularly interests you, and that you wish to investigate in more detail. This could be on your own or with a group of colleagues, as part of the Succeeding Together initiative. Your first task is to narrow this down into a manageable piece of research.

Step 1

TALK TO COLLEAGUES/MANAGER about your ideas. Does what you are interested in relate to the school improvement plan? Would a focus on this area lead to possible improvements in pupil attainment and/or achievement? Who else in the staff is interested in this area? Has it emerged because of the needs of specific individuals in your class? What information is already available (through your own assessments and/or data supplied by the Performance Unit) that prompts you to investigate a particular area further?

Find a focus - what needs to change?

Step 2

GET BACKGROUND INFORMATION. What is already known about the subject you are interested in? What do studies show, and what theories have been developed to explain the studies? This involves a literature search – reading teaching and education journals and texts. (See relevant appendix for suggestions).

Read what has already been done in that area.

Step 3

DECIDING ON THE PURPOSE OF THE INVESTIGATION. Your interest may fall broadly into one of the following categories, although it is more likely to end up as a blend of some or all of them.

Exploration: What is happening? Why is this class/group so noisy? How much work are they doing? What factors seem to be involved? Is there a different way of looking at this, of understanding what is going on? Are things going the way predicted?

Description: What exactly is the current situation in my context?
e.g. Giving a detailed profile of how a group of pupils work through the day, (and how perhaps this changes over time).

Evaluation/Explanation: Has the new approach (e.g. to writing) been effective, and what has contributed to the effectiveness? How well are the poorer readers progressing since getting paired readers, and why is that?

The purpose of your inquiry may well influence your research strategy. For instance, when you want to explore a situation in class, you may want to use structured classroom observations as one of your strategies, but also ask someone else to observe. When describing a particular situation, you may decide on short blocks of representative activities where a timed observation is used that can be duplicated at a later stage. Another useful tool could be a self-assessment questionnaire for the pupils that can be repeated. You will probably be most interested in an evaluative inquiry, where you set up some sort of intervention or experiment, i.e. you change something in the classroom or your practice that you hope will create an improvement. To evaluate or explain, you will need to have information about the situation before the change, and similar information some time after the change. This may quite simply be something like spelling ages 'before and after', but often you will also want some degree of exploration or description, because it will help you explain why the change worked or didn't work. All this will be explained in more detail later under 'collecting information'.

Are you going to explore, describe or evaluate?
Is there too much unproductive talk in my class?
Is there too much unproductive talk in group A during writing time?

In fact, what will probably influence your research strategy most is your research question.

formulating the research question - generating hypotheses

Having decided on a particular area that you want to investigate further, the next step is to develop appropriate questions, answerable within the constraints of time and resources. There is no point in amassing heaps of information (data), just because it looks interesting and might prove useful in the future, if it cannot be analysed or used to prove or disprove a point. It is necessary to be specific – to develop a clear focus for the inquiry so that relevant questions may be identified.

Develop the most helpful research question. Is it focused enough?

You need to narrow down your questions as much as possible. e.g.

- Will the children's writing improve with the new Checking Chum system?
- Are the children happier in the playground since we introduced the new buddy/friendship systems?
- Is there too much unproductive talk in group A during writing time?

You can see from the questions that, when you think about gathering evidence, you will need to be really clear about how to identify and measure the things you are interested in. How will you measure improvement in writing? Will you simply measure spelling scores, or should you also find a way of measuring the quality of the writing? How do you define 'happiness'? Can you come up with degrees of happiness? What exactly do you mean by productive v unproductive talk? Do you all agree on how you measure, so that you can compare results? When measures are less clearly defined, or may possibly be highly subjective (e.g. observations of behaviour rather than scores in tests or time on a writing task) you need to check that others agree with the way you interpret things. Having a cross section of staff to work with you at this stage should help make the questions (and their implications) clear.

Developing tentative hypotheses, related to your questions, often helps to clarify your inquiry.
For instance:

- The new 'Checking Chum' system motivates pupils to do better in writing, and keeps them more on task.
- The new buddy system improves pupils' social skills and relationships, as measured by …. (Here already a word such as 'happiness' feels inadequate, and you may start thinking about social confidence, greater security, fewer fights, etc.)
- Unproductive talk in group A leads to…. (Again, here you will already begin to think of the consequences of unproductive talk, such as limited progress, and you may want to think about the causes of unproductive talk, such as the social make up of the group, and how that affects group dynamics).

"Hypothesis Testing" developing a statement for what I think is going on

Talking to colleagues in other schools, and doing your literature review (see p4) at this stage, should also help with ideas and clarifying these ideas. You may even discover that your question has already been answered adequately elsewhere, and you were in danger of reinventing the wheel!

Example 2:
After conducting standardised spelling tests, Mrs Wilson (headteacher) was able to see that a large percentage of pupils across the school had scored significantly below average for their ages. Her hunch was that this could be due to many children not having support at home to complete their spelling homework. A Cued Spelling programme was introduced in three classes (P3, 5, and 7) in order to give children an opportunity to practise spelling during school time. The baseline data collected by the class teachers (the standardised spelling scores) provided a useful measure against which children's scores could be compared at the end of the trial intervention (after 10 weeks of using Cued Spelling strategies).

In addition, structured interviews with the teachers involved in the trial programme were conducted in order to gain information about how the programme was implemented in each class and how the pupils responded to the new technique. Focus groups of pupils from each class were also conducted to get feedback from students on whether they felt the strategies were helpful and how the programme might be improved.

The standardised spelling test was once again carried out with children in the target classes in order to compare post-intervention scores with the baseline scores.

formulating your research design

How to collect relevant information and devise your methodology

As the kinds of things you want to know will shape the kinds of information (evidence) you need to collect, time spent on making the questions quite specific and developing your hypotheses is extremely valuable. Then you are ready to set up your study.

Assuming that your investigation is related to a change in classroom practice, or other intervention, the next steps are no different from developing IEPs or 5-14 formative assessments:

1. Assess the current situation (baselining/benchmarking).

Research design: What is happening now?

If you want to prove that the changes you propose are making a difference, what information do you need to collect to start with? In the case of academic attainments, these are likely to be standardised tests that you can administer before you start your intervention and again after an agreed period of time. This may well be something you do anyway as part of your assessment practice. But perhaps you feel that the tests you normally use are not 'sensitive' enough, or are different from those used by colleagues, or other cluster schools. It may be helpful to find out what else is available by talking to your learning support teacher or your educational psychologist. You may also be interested not just in outcomes, but in what exactly was making the difference, or why, for instance, there was no improvement even though a lot of effort was put into the intervention. (If this happens, don't see it all as failure or a waste of time. You will always learn something from an investigation. Just think - if research results were predictable, we wouldn't have to do research in the first place.)

Observation schedules, structured interviewing, the use of questionnaires and rating scales are amongst the other methods most often used to obtain information. Several methods are likely to be superior to just one in shedding light on a particular issue (known as 'triangulation'), as all have their strengths and weaknesses. For more detail on the various methods, see the appendices.

An important practical consideration is how and when the information will be collected. Remember to tap into the skills of other people. Consider working alongside a colleague or enlisting the help of a student teacher or classroom assistant etc.

It is also unnecessary to 'test' or assess every pupil involved. Research often

uses sampling or matched pairs. In 'matching' a pupil who is part of the intervention is paired with another pupil who is very like the first, but is not part of the intervention. Matching is usually set up on the basis of age, ability and sex, but could of course use other criteria, depending on your investigation. 'Matched pairs' is especially useful with small numbers, but it may be difficult to find matches without extending the sample to another classroom or school. The most common kinds of sampling are representative sampling and random sampling. Representative sampling means that you select a number of pupils whose characteristics could be seen as representative of the larger group, while in random sampling you select pupils from a list by taking each third, fourth or fifth (etc) on that list. As with matching, representative sampling is complex, as the first question is 'representative of what?' - of the class, the school, West Lothian, Scotland, Britain?

Random sampling is simpler, but you need to end up with a large enough group so that your outcomes can say something meaningful about the larger group. For more detail on sampling and matching, see the relevant appendix, including 'glossary'.

2. Implement your inquiry or intervention strategy.

What is going to happen to make a difference?

To recap, at this stage you and your fellow researchers have considered the area of practice to be improved, and have narrowed down your focus of inquiry to something that can be done within the available resources (including the skills of other people and time). You have formulated one or more hypotheses about the project outcomes, and you have collected the first 'base line' information – if this is needed. Now you are ready to try out your plan.

When your study relies heavily on interviews or questionnaires, it might be advisable to run a short 'pilot'. This is when you try out your questions (or other ideas) on a small number of people, to see if they provide the kind of answers you are aiming for. In general, a short pilot could help to iron out any design faults or unforeseen problems.

It is a good idea to keep a diary during the implementation stage. This would help you keep a record of what happens, such as: any effects on the pupils; off-the-cuff remarks that pupils, colleagues and parents make; things that do not work out the way you anticipated, or work better. These notes can later prove to be of great value when you start to analyse the outcomes.

If your project takes place over a longer period (more than a month, say) it is also very useful to write up a 'progress report', to share for instance at a staff meeting. This will remind you of your starting point, and feedback from others can be very motivating, just when things begin to lose their lustre.

3. Re-assess the situation after an agreed period of time.

How do I know it's working?

This may be after the completion of a particular block of work, so you are measuring the end result. Or it may be that your intervention is a long-term project, and you will want to monitor progress at regular intervals along the way. There are some very good reasons for doing this. One of these is that regular feedback allows you to make adjustments to your plans. Another is that it is quite common for there to be very positive outcomes after a short period (of say six weeks or even a term) because everyone involved is aware this is something new and are motivated for things to succeed (the so-called Hawthorn effect).

Once the innovation has become run-of-the-mill practice, outcomes also tend to become less spectacular.

analysing and interpreting the data

There are software packages available to handle the analysis of certain types of material, from Access and Excel to e.g. SPSS. It is important to plan in advance which package will be used to ensure that the information gathered is formulated in a way that is easily absorbable into the chosen package. This would almost always involve some basic understanding of statistics. There are officers in education services who are very knowledgeable in this area, and often your educational psychologist will also be able to point you in the right direction. An appendix on basic statistical concepts is included in this pack.

Then all that is left is interpretation of the data i.e. what the results show, and the sharing of the results obtained. Again, it will be very helpful to interpret your outcomes with colleagues and others who have an interest in your research. This will prevent you from jumping to conclusions. Also, in education it is always helpful to consider not just the results, but what happened to create these results. Reporting needs to take into account the likely audience: the simpler the format the more easily accessible it will be to anyone who wants to know. It may simply be a talk to the rest of the staff or at parents' night, although having something written up may help when reporting back to people outside the school community. The excitement over a successful venture wears thin when you have to tell the same story over and over again.

How do I let others know?

Now - not only do you have evidence about what works, you are now in a position to make a strong case to anyone who may care to challenge your practice!

hints

Literature review:
Put aside a set period of time for reading the literature and stick to it. Moderation is necessary - if all the relevant literature were read then the research study would never get under way, so stick to recent articles in well known publications.

Research question:
As a first priority we need to ensure that the research question is clear and realistic in light of the time and other resources available. Be prepared to revisit the research question regularly as the research progresses.

Data collection:
Be rigorous about collecting only data with a direct relationship to the research question. Do not get carried away by enthusiasm and rush out to collect data which you later find you cannot use.

Consider carefully your method of data collection. If possible opt for a method that can be integrated easily into everyday classroom routines. Keep in mind how the data is to be analysed and do not gather information without considering how it will be used in the analysis.

Sample size:
It is quite possible to do something on a small scale but keep in mind that the sample size will determine whether or not you can generalise your findings.

Writing up research:
Writing a lengthy report can be time consuming, so it is helpful to consider other ways in which research findings might be disseminated (in-service presentation, a factual leaflet).

Finally:
Good research is demanding of both time and effort, but it is also rewarding both professionally and personally. Through research new skills are acquired and developed, and insights and understanding gained.

ethical guidelines

Ethical guidelines are needed to clarify the conditions under which research is acceptable. For any research undertaken, we must take into consideration the ethical implications and psychological consequences for the participants in our research. This means that consideration should be given to what the pupils are being asked to do and any foreseeable threats to their psychological well-being, health, values and dignity should be eliminated. Key issues here include: confidentiality, consent, respect for participants, and the sharing of outcomes once the research is completed. The main principle is that the pupils must not be treated as objects of the research but as active participants. The effect of any experience on their well-being must be considered.

Here are the key issues in more detail:

Confidentiality:
Due to legislation, including the Data Protection Act, information gathered regarding participants in research is confidential unless otherwise agreed in advance. Any data that is shared or published should be made anonymous so that individual participants cannot be recognised.

Consent:
Where participants are taking an active role in the research, it is necessary to get their consent (and/or the consent of their legal guardians) before including them. Whenever possible, all participants should be told of the aims of the research and what they will be required to do. This knowledge allows participants to give their informed consent to be a part of the investigation.

Respect for Participants:
Good research is possible only when there is mutual respect between investigators and participants. It is important to consider how the process of evaluation or research may affect the participants and to reduce or eliminate any negative effects. For example, if you are planning to test the participants every week and you know a particular child is not likely to do well on the tests, then you should take into consideration the effect this may have on the child. You may then decide not to include the child in the investigation or may find another way of gathering the required data without putting the child in a position where he is likely to experience repeated failure.

Sharing outcomes:
Once the investigation has been completed, it is considered good practice to share the outcomes with the people who participated in the study. This also gives the participants a chance to discuss what they thought of the project and how they felt about participating in the research.

glossary

Action Learning Enquiry: (Action Research) is concerned with solving concrete problems in real situations, in a scientific way. The aim of this often small scale research approach is to make sure that research findings actually get used to improve the identified problems. Practitioner involvement (often collaboratively) is central to the approach, and as such lends itself well to improvement studies in teaching and learning.

Evaluative inquiry: research that is concerned with the effectiveness and appropriateness of an innovation or (new) programme.

Evidence: reliable findings to prove an intervention effect.

Hawthorne Effect: initial positive outcomes simply because of the attention and special treatment given by the researchers. (The name comes from a series of experiments carried out at the Hawthorne Works in the US in the 1920s – 1930s. Investigators found increases in productivity regardless of the specific changes that were brought about, such as length of working day, heating, lighting, etc.)

Hypothesis: an educated guess or intuitive hunch as to what is going on in a situation (but often the result of reflective thinking, study or observation).

Intervention: a deliberate alteration in the situation, or programme, in the hope that the situation or results improve.

Likert Scale: a rating scale, usually to measure attitudes. It consists of a range of related items with fixed alternative responses. These tend to be 'strongly agree', 'agree', 'undecided', 'disagree', 'strongly disagree'. The items should be a balanced list of positive and negative statements, typically of between 20 to 30 items.

Matching: is used in a so-called 'matched pair design'. This involves pairing subjects on some variable(s) that is/are seen as related to the variable that is being studied. One member of each pair is then allocated to the intervention group and the other to the control group. For example, in order to show that 'Paired Reading' works, a class could be split up, matching pupils on age/gender/ability where one half of the matched pairs gets 'Paired Reading' and the other half does not. Differences in overall results would then show evidence of an intervention effect. Drawbacks related to practical (it's not always easy to find suitable pairs), as well as ethical issues (is it fair for some pupils not to get something that would allow them to make better progress?).

Norm-referenced tests: are tests that show whether the individual has achieved (or not achieved) a certain standard of competence (e.g. awareness of letter sounds and names).

Observation Schedule: help to structure observations. Usually it is a checklist of predetermined behaviours that are ticked when these are seen to take place. It gives a record of how often certain events (such as talking, being on task, being out of seat) occur within a certain space of time.

Outcomes: results.

Pilot: a study that acts as a 'dummy run'. It usually involves trying out a research design, questionnaire or observation schedule on a much smaller group, to find out what unforeseen problems arise, or unpredicted outcomes, which will then help to create a more effective and realistic investigation.

Pre-test and Post-test Methodology: the group is tested before the intervention takes place, and afterwards is tested again. This method is more reliable ('valid') in matched groups. With a single group, it may be hard to prove that the effect is solely due to the intervention. Other factors, such as maturation or attendance problems, may have an effect on the outcomes.

Qualitative approach: a research process that is often seen as less 'scientific' because it is more interpretative or 'ethnographic'. It relies on interpreting personal observations, and people's experiences, views and feelings. Ideas, perceptions, theories come after data collection, rather than before. Qualitative research tends to be used to generate hypotheses rather than to test them. It is a helpful approach to find out why the intervention has been successful or not successful, and can suggest ways to improve the intervention. Because of the danger of personal bias, qualitative research is best done as part of a small team, so that perceptions can be checked off.

Quantitative approach: is often seen as more 'scientific' because it tends to be based on collecting numerical data (exam results, reading ages, etc.). It is often used to test out a hypothesis, or prove the positive effect of an intervention, and can rely quite heavily on statistical analysis. Results can be used to predict outcomes in similar situations.

Random: random assignment to an experimental study aims to prevent selection bias. For instance, by choosing every fourth child on the class list, or every 20th pupil on the school role, the selector cannot be influenced by individual characteristics. This is especially useful when selecting two groups that are to be compared.

Rating Scales: tend to consist of a list of related items (usually behaviours) one is asked to rate either by number (1 to 3, or 1 to 5), or by ticking fixed responses such as 'agree', 'don't agree'.

Research Design: an agreed plan to get relevant answers to the research questions. Any research design involves one or more research strategies (e.g. do an experiment, a case study, a survey) and decisions about the best methods of investigation (observations, tests, questionnaires, interviews etc.). It is important that the design takes into account the aims and purposes of the research within the practical constraints of place, time, staff availability and funds.

Self-assessment Questionnaires: are used to get respondents to assess their achievements, attitudes and/or feelings. There are now a range of pupil-focused self-assessment questionnaires commercially available to measure e.g. attitude to school, learning, behaviour, and motivation.

Standardised tests: are tests that have been 'standardised' (usually age-normed) on the general population. Results indicate how far the individual is removed from the average. Reading tests, for instance, are often standardised, giving a 'reading age'.

Statistics: mathematical analysis of numerical data. At the simplest level this could involve the average (mean) progress of a class, as a result of an intervention. Or it could be establishing correlations between variables. Calculations (and set formulae) can be complex, but computer packages such as SPSS may take the grind out of number crunching. Access to a statistical consultant before finalising a research design could be important.

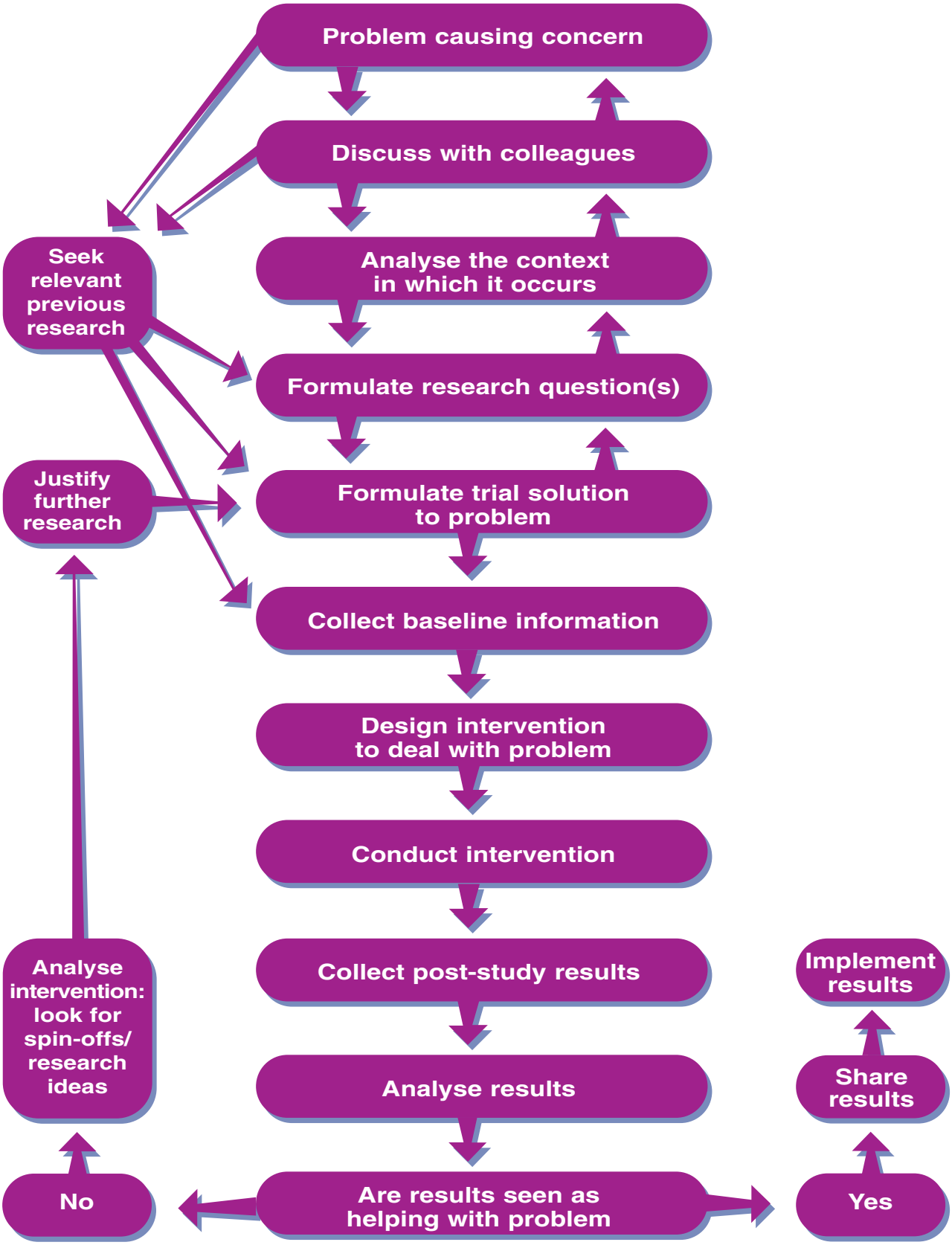
Structured interview: the interviewer has a fixed set of questions prepared before the interview.

Systematic Enquiry: having defined the research question, the researcher is conscientiously using appropriate strategies and reliable methods, to gain the required information. Systematic inquiry does not exclude changes in the research design as the study progresses, it this is likely to improve the quality of the actual inquiry.

Timed Observation: when target behaviours are ticked or coded at frequent, pre-set intervals, such as every 10 to 15 seconds.

Triangulation: in surveying, triangulation is a way of getting a 'fix' on where something is by taking measures form two or more places. In social research, it is a way of ensuring that errors related to one method have less influence on the 'real' answer by using a variety of methods. This may be done by using difference sources of information (pupils, teachers, parents), methods (tests, observations, self-assessment questionnaires), investigators (colleague, other professional, research assistant) and/or theories.

flow diagram



examples of possible interventions and their evaluation

1 On-task behaviour

The teacher is concerned about the degree to which a number of children in the class are attending to tasks set. She feels sure this is affecting their level of attainment. She is interested in peer tutoring, and wonders if peer influence can make a difference.

Collects baseline information about the target children's level of work output by:

a) observing on-off task behaviour, for example through time sampling (with the help of a classroom assistant, student, parent or educational psychologist)

b) focusing on one or more areas of curriculum, gathering data showing work completed (and possible qualitative data such as, e.g. neatness, correctness)

Chooses intervention: Teacher has discussions with HT, other staff and professionals, is guided towards relevant research literature and chooses an intervention that has been evaluated as effective in the literature, is practicable, and that she feels competent to implement. Teacher identifies any support, resources or skills required and ensures these can be provided before embarking on intervention.

Designs and implements intervention: 'Checking Chums' for a period of, say, 6 weeks. This intervention involves training the children in pairs to check that each partner has completed work set by the teacher, at given points during the day. Rewards can be given for those individuals or pairs who reach the completion targets.

Evaluates effectiveness:

a) repeats observation of on-off task behaviour
b) gathers data showing work completed (as above)
c) elicits children's opinions of the intervention (e.g. through discussion)
d) Keeps diary of own observations throughout the intervention – this might throw up benefits which were unexpected offshoots of the programme, or refinements/difficulties which were unforeseen.

Shares results with other members of staff: The staff member or members' experience gained through this intervention is an invaluable asset to the school's continuing development, no matter the degree of success enjoyed through the intervention. Either way, valuable lessons have been learned, and skills developed.

2 Improving the quality of writing

A teacher is dissatisfied with the writing lessons in her class. She believes that the stories her children are writing lack interest and length, and that the children are not really engaged in the writing process. She has to spend a lot of time 'chivvying' them along. She wonders if her pupils would be more engaged if they had an opportunity to elaborate and collaborate.

Collects baseline information: about the writing produced by the children using criteria extrapolated from 5-14 language assessment. (e.g. quantitative – length of stories; qualitative: structure, vocabulary, quality of ideas, etc.) She also asks a colleague to observe one of her lessons and give her feedback about the way she sets her writing lesson up.

Chooses Intervention: Teacher has discussions with HT, other staff and professionals, and reads relevant literature on encouraging/improving writing skills. She reflects on practice and observation of lessons. She identifies the need for the children to become more actively involved in the generation of ideas in order to motivate their writing, as well as the sharing of the products of their writing, while retaining the structured approach required to ensure skills are learned. Teacher decides to try out a number of more interactional and collaborative approaches to the writing process, ensuring that there will be plenty of discussion. She identifies support, resources and skills required and checks these can be provided before embarking on the intervention.

Designs and implements intervention:
She came up with the following ideas:

1) Spidergram modelled on board; class spidergram created on board; children in groups/pairs to devise spidergram for story.
2) Children to write story in pairs with criteria for success specified.
3) Children to present ideas to class as storyboard with class elaborating the story further.
4) Children read out parts of story on daily basis, invite comments from others.

Evaluates effectiveness: This intervention involves a number of different approaches within a framework of greater interaction and discussion, with more emphasis on the process and less on the product. However, by ensuring that the children, having gone through the processes, produce an end product, the teacher will be able to evaluate, using the criteria, whether the quality of the writing has improved. She is also able to check on on/off task behaviour to see if this has improved. She also has a discussion with the children to find out what they liked about the new approaches, and what they found difficult.

Shares results:
As in example 1, the teacher will have learned about the links between teaching and learning from her intervention, that she would like to share with colleagues. She will be clearer which of the approaches she tried work best with her class, and tries to include these in other areas of the curriculum. She also shares with her pupils any positive outcomes, to further improve their motivation and perception of being adequate learners.

3 Improving spelling

The teacher is concerned about the spelling attainment in her class. She is also not sure to what extent the children are actively engaged in learning their spelling. Is she teaching them using a method that is too limited in range? She is an aware teacher, who has some knowledge of the research literature about the importance of children developing awareness of how they learn and monitoring their own progress. She wonders whether a greater emphasis on metacognition would make a difference.

Collects baseline information: about the children's progress in spelling through results from the weekly test. (She uses the opportunity to teach them about graphs and gets the children to plot their improvement over the next 3 weeks on bar charts.) She also asks the children to write down how they learn their spellings, and what methods they use if they are unsure. Teacher observes children doing their spelling.

Chooses intervention, designs and implements it: the teacher decides to combine the development of the children's metacognition and her own interest in developing spelling methodologies. She reads handbook on different spelling methodologies, consults with adviser/LS teacher/EP, and decides to run an 8-week programme whereby the children are tutored in a different spelling method every other week, and learn their week's words using that method. They plot their test results week by week. They also have time set aside to discus in small groups which method they prefer and why.

Evaluates intervention: at an individual level, children survey their test scores to judge which method has worked best for them. This information can be collated on a class basis. They also discuss this as part of group/whole class. The teacher also judges the success by measuring whether there has been overall improvement in the scores of the class, and/or particular groups of pupils. Can the pupils articulate better now how they spell? Is there more discussion in the class of the learning process? Do pupil comments suggest there is more enthusiasm for learning spelling?

Shares results: the children themselves make up a display, both of the results and their views, for the entrance hall. Two volunteers also do a brief presentation at assembly. The teacher has agreed to write a short paper, with the LS, for a periodical, a copy of which will be sent to the EO.

appendices

1 focus groups

Compared to individual interviews, focus groups usually 'elicit a greater, more in-depth understanding of perceptions, beliefs, attitudes, and experiences from multiple points of view' (Vaughn et al, p.16). While in individual interviews the respondent may give the kind of answers he or she thinks the interviewer wants to hear, in a group the participants feel more in control and debate their views with others. The researcher is also more likely to find out about the feelings that underlie statements made by the participants.

Focus groups typically consist of 6 to 12 people who share some common characteristic (in a school context, for instance, they could all be parents, or pupils, or supporting agencies). A group smaller than six is unlikely to provide a wide range of ideas, but when larger than twelve, it could fragment and those sitting close to each other would start talking to each other. Focus groups work best when there are two researchers (called moderators). One asks the questions and ensures that all the participants get a chance to state their views, without feeling put down or intimidated by others. Equally, this person makes sure that no one dominates the discussion. Clearly, this researcher needs to have good interpersonal skills. The second moderator observes what happens in the group, and takes notes on what is said as well as the context of the answers: Are they given in a relaxed, confident way, or tentatively? Do others in the group agree, verbally or non-verbally, or are they dismissive? Do group members respond in detail, or do they answer half-heartedly before moving on to something more interesting to the group. If so, why is that? This involves good observational as well as good note taking skills. Audio/video recordings make this task a lot easier, but notes still need to be taken unless the researchers are able to identify individual voices. Focus groups tend to take longer than half an hour, so it may be helpful to swop places halfway through.

Organising focus groups requires careful planning. Respondents need to be identified so that they are representative of the larger community (e.g. parents from varying backgrounds) and an appropriate venue found. To create a welcoming atmosphere, it is helpful to have refreshments. The group needs a formal welcome, with an explanation of the purpose of the meeting and how it is all organised. Beforehand, the researchers need to have agreed on the main questions (usually no more than 10) to be used to guide the discussion from one topic to the next. To put the group at ease and get the discussion going, the first question needs to be a general one, such as 'What do you think our school is good at? Can I ask you first, Mrs X?' Once the group has started, the moderator's main task is to promote debate, by asking further open questions, by challenging participants (especially on differences) and by teasing out a lot of meanings. They need to keep the session focused, and may need to steer the conversation back on course. It is important that they do not get involved, but should summarise the various opinions non-judgementally to get agreement from the group that this is what has been said, before moving on to the next question.

Apart from getting a lot of information on not only what people say but what they do, a focus group also empower participants because it makes them valued as experts, and gives them a chance to collaborate on issues that are brought up. As such, it can be helpful in an educational setting beyond just data collecting.

Further reading

Greenbaum, T.L. (1998)
The Handbook for Focus Group Research. London: Sage

Morgan, D.L. (1998)
Planning Focus Groups. London: Sage

Vaughn, S., Shay Schumm, J. and Sinagub, J. (1996)
Focus Group Interviews in Education and Psychology. London: Sage.

Psychological Services can give further support.

2 inventories and checklists

Checklists and inventories are such common phenomena in ordinary life that standard text books on research rarely feel the need to discuss them specifically. At their most elemental, checklists are exactly what they say they are: a list of objects or activities you can tick off when you have completed them – e.g. shopping list, MOT list, classroom register. Inventories may be more comprehensive (a complete list, or more subcategories), but the terms are often used interchangeably, along with schedule and profile. Sometimes rating scales and questionnaires are also seen as checklists.

Early years development (e.g. the Portage Checklist; Teaching Talking), some baseline assessment in P1, descriptors of levels in 5-14 assessment, and self-assessment profiles, to mention but a few, typically take the form of checklists. Checklists are popular because they are a quick and simple way of getting information that is easy to assemble, and analysis can be automated. They can be repeated at later dates to allow for comparison, or measurement of progress. Checklists are also versatile, in that identical or at least comparable forms can be completed by teachers, parents and children. A well-known example of this is the Child Behaviour Checklist (Achenbach, 1991).

Example 1:
In an intervention study setting out to improve communication skills in an S3 class, all the pupils were taught the various components of good interpersonal communication. Following this, they practised these skills in small groups, using real classroom tasks, while being observed by a fellow pupil. These peer observers had a short checklist as a prompt to remind them what to look for, such as eye contact, attending, encouraging questions etc. This allowed them to take brief, pertinent notes for later feedback.

Checklists are good for quickly identifying issues, and it is usually fairly easy to make up your own, provided you have a clear focus and the checklist is appropriate for the type of analysis you wish to carry out. An example is the one developed by Ashcombe School where staff were interested in good learning behaviour. This is a fragment of their checklist which looks at study skills and attitudes:

Example 2:	**++**	**+**	**–**	**– –**
Preparation for lessons	**Almost always well prepared with equipment and resources needed for lessons**	**Usually well prepared with equipment/ resources needed for lessons**	**Sometimes forgets equipment/ resources**	**Frequently forgets equipment/ resources; inadequately prepared**
Identifying targets	**Keen to be fully involved in identifying areas of strength/ weakness and to set appropriate targets; individual and thoughtful involvement**	**Willing to identify areas of strength/ weakness and to set appropriate targets**	**Sometimes unwilling to identify some areas of strength/ weakness and to set appropriate targets**	**Shows little interest in learning from experience, in identifying areas of strength/ weakness and in setting targets**

Source: Pringle and Cobb, 1999, p.82

Douillard (2003) similarly created her own Dimensions of Writing, breaking down the main areas (Craft, Organisational Element, Conventions and Writing Behaviours) into different subcategories and levels. In much the same way Jones (2002) developed her framework for assessing speaking and listening, by outlining five levels in listening, speaking and classroom interaction respectively.

But there is also a wide range of commercially available checklists and inventories, a few of which are listed below. The Psychological Service will be able to advise on suitability and will have many resources available for you to tap into.

Measure	Topic	Age Range
What I do to Learn What Stops my Learning	Tactics for more efficient learning	8-11
Life in School	Bullying.	5-18
Myself as a Learner	Self-rating scale for academic self-esteem.	11-16
Locus of Control Scale for Children	Locus of control	9-18
My Class Inventory	Classroom environment	8-11

As with all research tools, there are weaknesses attached to the use of checklists and inventories. Simplicity usually equates to gathering data that do not have great depth to them, and may not tell you how to solve a problem, or why things are the way they are. Also, it is easy to believe that Checklists are objective, but remember it is your (or the pupil's) own personal judgement or opinion you are exploring. Checklists are therefore only really useful as one of a number of ways of exploring a problem or situation (triangulation).

References:

Achenbach, T.M. (1991). Manual for the Teachers' Report Form & 1991 Profile of the Child Behaviour Checklist. Vermont: University of Vermont.

Douillard, K. (2003). 'Writing matters: exploring relationships between writing instruction and assessment'. In A. Clarke and G. Erickson (Eds.), Teacher Inquiry: Living the Research in Everyday Practice. London: Routledge Falmer

Jones, L. 'Using videos to investigate speaking and listening'. In O. McNamara (2002). Becoming an Evidence-Based Practtioner: A Framework for Teacher-Researchers. London: Routledge Falmer

Pringle, M. and Cobb, T. (1999). Making Pupil Data Powerful: A Guide for Classroom Teachers. Stafford: Network Educational Press.

Further Resources:

Frederickson, N. & Cameron, R.J. (Eds). (1999). Psychology in Education Portfolio. NFER-NELSON.

Sclare, I. (Ed). (1997). Child Psychology Portfolio. NFER-NELSON.

3 Likert scales

In educational research Likert Scales are often used because they are quick to complete, of interest to respondents (pupils and teachers alike) and relatively easy to develop. A Likert Scale (named after its deviser Likert, 1932) typically provides a range of responses to a statement or question, either numerically (1, 2, 3, 4, 5, of which 1 may be 'not at all' and 5 'a very great deal') or of the 'strongly agree' to 'strongly disagree' variety. They tend to be used to measure attitudes or opinions, such as current classroom practice and school-based innovations, but also on perceived pupil behaviour or pupils' views of themselves as learners. Because people usually enjoy filling in a scale of this kind for its innate interest, the answers they give tend to be more considered, adding to the validity of such a research tool.

How to develop a Likert Scale

1. As always, the first step is to reflect on what your question or issue is. What exactly do you want to find out? Reading round the issue may help, as may 'brainstorming' with colleagues, and finding out about scales already available. Some examples will be listed below.

2. When developing your statements or questions, be aware of 'obvious' and extreme ones, such as "I like to do well in school" (don't we all?) or School should close at 2.30 daily" (yes!). The likelihood is that everyone will give the same response and you are not any the wiser, unless you aspire for a future in politics. To encourage respondents to consider each item carefully, it is also best to devise an equal number of positive and negative statements. Some Likert Scales employ items that are phrased differently, but aim to tap into the same attitude (see e.g. items 2 and 7 in example 2). This is done to check if the respondent is reliable and consistent.

3. Decide on your response system. If you opt for the '1-2-3-4-5' scale, make absolutely sure that respondents are clear whether 1 or 5 corresponds to 'strongly agree'. It sometimes helps to have an example at the top of your scale, as well as a clear indication. Many scales use 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree'. For younger children 'always', 'sometimes', 'don't know' and 'never' may be easier, or a smiley face, straight face and sad face.

4. If you are developing a scale totally from scratch, and you want to make sure it is valid and reliable, you should trial it on a large and representative sample. Remember to have your items in random order. After scoring (for instance, with positive statements 5 points for 'strongly agree', 3 for 'neutral', 2 for 'disagree', 1 for 'strongly disagree' and with negative statements, 1 for 'strongly agree', 2 for 'agree' etc.). Using an 'item analysis' will help you decide which items show discriminative power (see Robson, p. 258), but this is complex. It may be easier, therefore, to use published scales. A good source for these is Psychology in Education Portfolio (Fredrickson and Cameron, 1999).

Example 1

Please circle any of the seven positions.

(+3 or –3 = always, +2 or –2 = frequently, +1 or –1 = sometimes)

POSITIVE DIMENSION								NEGATIVE DIMENSIONS
GENERAL ATTITUDE								
Attends school	+3	+2	+1	0	-1	-2	-3	Misses school
Attends my lessons	+3	+2	+1	0	-1	-2	-3	Misses my lessons
Happy re school	+3	+2	+1	0	-1	-2	-3	Worries re school
No complaints physically	+3	+2	+1	0	-1	-2	-3	Complains of aches & pains
Appears confident	+3	+2	+1	0	-1	-2	-3	Seems lacking in confidence
Conforms to school rules	+3	+2	+1	0	-1	-2	-3	Breaks school rules
Responds well to correction	+3	+2	+1	0	-1	-2	-3	Responds badly to correction
Parents support school	+3	+2	+1	0	-1	-2	-3	Parents do not support school
Student cares re parent view of performance	+3	+2	+1	0	-1	-2	-3	Student does not care re parent view of performance

Example 2

a = definitely agree e = strongly disagree

1	I'm good at doing tests	a	b	c	d	e
2	I like having problems to solve	a	b	c	d	e
6	I need lots of help with my work	a	b	c	d	e
7	I like having difficult work to do	a	b	c	d	e
11	Learning is easy	a	b	c	d	e

From: Myself as Learner Scale (MALS)

Example 3

1 = No Never 5 = Yes, Always

D = Difficulty

C = Competence

A = Attitude

C		1	Can you work out what a story means?
A		2	Do you feel good when you do reading work?
D		3	Is reading to the class hard for you?
C		4	Can you work out hard words by yourself when you read?
A		5	Do you like word games in class?

From: Reading Self-Concept Scale

Cautionary Factors

1. The scales do not show equal intervals. In other words a score of 4 is not twice as strong as 2, nor can one assume that the difference of opinion between 'strongly disagree' and 'disagree' is as intense as the difference between 'strongly agree' and 'agree'.

2. Most people like to avoid extreme statements and may therefore wish to avoid the two extreme poles. However, this also makes it more interesting when respondents do tick or circle such statement. Equally, people like to avoid negative statements so that there tends to be a bias towards the positive. The rule of thumb here is that if positive statements total more than 70%, the outcome is indeed positive.

3. As with all forms, respondents may be deliberately falsifying their replies. That is why a Likert Scale is useful as one tool in triangulation. As suggested earlier, some items can be used to tap into the same attitude or opinion, to check up on consistency. For instance, in example 2 questions 2 and 7 appear to be very similar.

Evaluation and Feedback

Because of its potential numerical nature, Likert Scales lend themselves to representation in bar graphs. For those familiar with, and interested in, statistical analysis to investigate differences between sample groups, you can use non-parametric methods such as:

- For 2 unrelated samples – Mann Whitney test
- For paired samples – Wilcoxon signed rank test
- For 3 or more samples – Kruskal Wallis test.

Your Educational Psychologist should be able to advise you on any qualitative analysis.

References:

Fredrickson, N. and Cameron, R. J. (1999). – Psychology in Education Portfolio (NFER-Nelson).

Further reading:

Cohen, L. Marion, L. & Morrison, K. (2000) – Research Methods in Education (5th Edition). Routledge Falmer.
Robson, C. (1998). – Real World Research. Blackwell.

4 how to conduct a literature review

In action enquiry, a review may simply involve finding out about relevant classroom materials and/or teaching approaches – and talking to colleagues and education officers who have expertise in your particular area of interest may sometimes be all you need to do. Having said that, being able to do a literature review is an important skill for the practitioner who wishes to develop their practice based on evidence. Reviewing literature means being able to systematically gather together, critically appraise, and summarise research findings relating to a particular topic. Each individual piece of research literature included in the review is studied in order to assess whether its conclusions are supported by the evidence presented, and are therefore trustworthy. Finally, the review findings are related to current practice - an important but often difficult task.

Why perform a literature search?

As part of your written report, the literature review is there to ground the reader in the area and explain why your research fills a gap. A literature search needs to be systematic and focused – you are not looking to read everything in a broad area, only things which are relevant to your work. A literature search must also be evaluative - you need to assess critically each reference found to determine if it is worth pursuing.

Any investigation will involve reading and reviewing what other people have written about your area of interest. This is done for a number of reasons, primarily to give support and justification for your work, and to ensure that you are not repeating what others have done. It can also help you look around the problem for helpful ideas, and compare your work to prior research.

For the researcher, the literature review process is critical in determining the research question since examining other's work in the area will show what has and has not been researched, what questions have and have not been answered. The research methods to be used may also be influenced, for example, when the literature review indicates a standard approach taken by experts in the field. Regardless of the motivation for carrying out a literature review the process should be the same, the key being that a systematic approach is taken at every step of the way.

What is involved?

Conducting a literature search is a ten-step process. It is very important to accurately record everything that you do and that you find at the time. This will demonstrate how you are progressing, and will save much time hunting for the information later on.

The ten steps are:

1. Plan your search strategy
2. Carry out the search on relevant bibliographic indexing databases
3. Refine your search strategy until it produces relevant results
4. Evaluate the results your search produced
5. Save the useful results
6. Record what you have done
7. Repeat the process using different databases
8. Evaluate all the literature references you have saved
9. Find the literature you require
10. Read!

Where do I Search for Literature?

Literature relevant to your research may be available from a number of sources, whether in hard copy or electronic format.

Search for references using:

- Journals or electronic databases (such as the British Education Index) available via the library
- Journals you or your school already receive
- Web-based, research specific, search engines, such as:
  http://www.scirus.com/
  http://www.scotland.gov.uk/Topics/Research
  http://www.scre.ac.uk/spotlight/index.html
  http://www.sosig.ac.uk/education
  http://www.leeds.ac.uk/educol/
- West Lothian Library Services

Different databases concentrate on different areas so search for ones relevant to your subject area. However, it should be emphasised that searching the electronic databases alone is usually not enough. They contain only selected journals, therefore it may be necessary to "hand search" other relevant journals because most databases do not contain unpublished literature (e.g. reports, theses, dissertations and most importantly research which has not been submitted or which has been rejected for publication). An effort has to be made by the reviewer to trace such sources to ensure a comprehensive review. Scanning the reference lists of articles found through database searches is a good way to identify further studies for consideration, as does the reference list at the end of key books.

Further reading:

Harlen, W. and Schlapp, U. (1998). Literature Reviews. Spotlight 71. SCRE.

Stark,R. (1998). Practitioner Research: The Purposes of Reviewing the Literature within an Enquiry. Spotlight 67. SCRE.

5 sampling and matching

Sampling

Sometimes you might want to try out a new idea or programme on more that just a small group of children but you do not have the time to collect data from a number of classes let alone a number of schools! This is where 'sampling' and 'matching' come into their own. A 'sample' is what the word suggests – a selection of people that is representative for the whole group you are interested in. Sampling your participants is an important part of research and should be given consideration at the planning stage. To help you make your decision, three main questions need to be addressed:

1. Sample Size: How many people should be in the study? Firstly, consideration needs to be given to your plans for analysing data. To employ statistical analysis (such as comparing two groups to see if they are significantly different from each other) it is suggested that a minimum of thirty participants are needed. Secondly, you need to consider how you are going to gain access to your sample, as well as the time and financial costs it will incur. For example, you may wish to sample 500 children, but if each assessment takes up to four hours and you need to have results in two months' time, you may find that you run out of time to complete the task. Deciding on a smaller sample size at the planning stage would be more realistic. The size of your sample will also be affected by your designated population. For example, thirty pre-schoolers are enough if your population is your school, but very low if your population is all the pre-schoolers in West Lothian. The key thing to remember is: the more varied your population the larger the sample size needed.

2. Representativeness of Sample: What is the population that you are interested in? Do you want to be able to generalise your findings? The population you are interested in can be considered to be on a continuum from the individual (e.g. one P7 child) to the whole population (e.g. all P7 children in the world). You need to decide the parameters of your study and sample accordingly (e.g. are you interested in all P7 children in your school/local authority/country?).

   The population of your study has important implications for the claims you can make about the findings. For example, if you sample your school and find that 'formative assessment' increases attainment, you cannot make generalised claims about formative assessment per se. Nor can you argue that formative assessment should be rolled out across the whole country on the basis of your findings. In this case, your findings are only specific to your school because that is the only sample you included.

3. Sampling Strategy: How are you going to choose your sample? There are two main ways of sampling: 1) random (probability) where each individual in your population has the same likelihood of being included (e.g. you can select every 5th name on a class list, or randomly select a number of pupils from each year group); and 2) purposive (non-probability) where some members of the population will definitely be excluded (e.g. you are assessing reading skills in your P7 class but do not include anyone with a reading age under 7 years). Both methods have a number of strengths and weaknesses and the decision will need to be based on your action research project.

Matching

When you start to design your research project you may wish to consider matching your participants (called the research group) with another group (called the control group). This can allow you to examine the 'real' effects on the pupils of your intervention strategy. Pupils can be matched on a number of factors but the most common are age, sex, and/or ability (such as reading age). Matching allows you to compare performance without 'noise' from other factors that may influence your findings such as social background or classroom effects.

For example, a P5 class teacher introduces a new writing scheme to her class and wants to see if the boys' writing will improve. However, as you know writing is practised in schools every day. So, if there is an improvement, the teacher may be unsure as to whether or not this was caused by the introduction of the new writing scheme. Other factors, such as 'practising writing' may have contributed to this improvement. In this case, the teacher could match her research group (boys in her class) with a control group (another group of boys not in her class) that were matched on a number of factors. It would be sensible to match according to age (in months), initial writing skills and the amount of time spent practising writing. By comparing the two groups she will be able to examine what impact her new scheme is really making.

Further reading:

Cohen, L.; Manion, L. & Morrison, K. (2000). Research Methods in Education. (5th Edition). London: Routledge Falmer

Robson, C. (1993). Real World Research. Oxford: Blackwell.
Thompson, S.K. (2002). Sampling. NY: Wiley

6 classroom observation

Observation is one of the most straightforward ways to gather information and get a picture of what's happening in your school or classroom. It is often a good way to begin to explore a situation you want to know more about. It can also be useful to add information to other sources of data you may be collecting for your action enquiry. However, it is important to be aware that as an observer you can often affect the situation you are trying to observe.

When is Observation Used?

- Commonly used during the exploratory phase of an investigation, typically in an unstructured form, to find out what is going on. The information gathered can help to generate ideas about what or why something is happening. These ideas, or hypotheses, can then be tested in your action enquiry.
- Can also be used in a multi-method case study to collect data that may complement or set in perspective data obtained by other means, such as interviews.
- Observation may be the main method in a particular study when the intention is to describe what happens in a particular situation.

Observational Methods

1. Informal information gathering - less structured, allowing observer freedom in what information is gathered and how it is recorded. It includes note-taking, diary-keeping, and generally gathering information from participants. Such observation requires the observer to organise the data gathered. The results, of course, are likely to be highly subjective.

2. Formal information gathering - imposes structure and direction on what is to be observed through the use of prepared schedules or checklists. The observer is systematic, i.e. attending to only pre-specified aspects. High reliability and validity between different observers is easier to achieve, but at a cost of complexity and completeness of the information available. If the schedule or checklist is developed by a group of interested people, the data are likely to be more objective.

Role of the Observer

Generally the role of the observer can be 'pure' (unnoticed, part of the wallpaper) or participatory (e.g. participate in what is going on in the situation observed). The latter will use qualitative, unstructured approaches of observation; the former might use a mixture of both quantitative and qualitative approaches. Whilst the 'pure' observer uses an instrument (e.g. proforma) for the observation, the participant-observer is the instrument. For example, the class teacher may be interested in finding out how children solve a multiplication problem. As a 'pure' observer she will use an observation checklist, ticking boxes as she observes the pupil on a pre-determined problem-solving activity. Then, as the 'instrument' herself, she may ask the pupil what he did, why he did it, and may even set him another, but similar, task, to see if he uses the same strategy. By doing so, the teacher will influence the outcome, but in the context of teaching and learning this may be a valid method of observation.

Collecting Data Through Informal Observation

The basic task of the participant-observer is to observe the people in a specific setting and to collect information from them. Whilst you may have formal interviews with those observed, you could also have 'on the wing' discussions. In the subsequent write-up, it is common practice to start with descriptive observations (describing the people, setting, and what is taking place). This may include:

- Space (layout of room, playground, etc)
- Participants (names and relevant details of the people who are observed)
- Activities
- Objects (physical elements such as furniture)
- Actions
- Events
- Time (sequence of events)
- Goals (what actors were trying to accomplish)
- Feelings (emotions in particular contexts)

These data usually lead to further reviewing of the observation process, reflection, and possibly refining strategies.

Collecting Data Through Structured Observation

Although structured observation is limited and limiting, its great advantage is its simplicity. Once you have decided your focus, you can repeat your observation at any time. As there is a schedule or checklist being used (usually with clearly defined behaviours to look for), it is easy for anyone to carry out a repeat observation. One simple strategy would be to do a "head count" at various times during the day, for instance to log "on task/off task" behaviour. Another one would be to tick what the pupils are doing when they are off task (using a proforma with pre-defined categories of 'off' task behaviours).

Example of a Structured Observation Schedule:

Whole Class On-task/Off-task Recording Form

Class Activity..... Teacher .....

Date of Observation ..... Time of Observation ..... to .....

Observer..... Length of Observation Interval .....

Interval	Academic On-Task	Procedural On-Task	Sanctioned Off-Task	Unsanctioned Off-Task	Dead Time
1					
2					
3					
4					
5					
6					
7					
8					
9					
10 (etc)					
Totals					

Observational Biases

- Selective attention—all perceptual processes involving the taking in of information by observation and its subsequent internal processing are subject to bias. Our own interests, experiences, and expectations are likely to influence what we pay attention to. Do make a conscious effort to distribute your attention widely and evenly.
- Selective interpretation—expectations colour what you see and in turn affect the interpretation/judgement of your observation. Start with an open mind and keep it open.
- Selective memory—the longer you wait with the writing up of your narrative notes of your observation, the more pre-existing ideas and expectations will influence it. Write up field notes into a narrative account promptly.
- Interpersonal factors—personal standards of behaviour, expectations and tolerance levels can also affect your observations. Be aware of this and set aside all biases during the observation, when making notes and evaluating data. In other words, try to "paint" what you see—not what you would like to, or indeed hope to, see.

Hints and Tips

- Even with the most unstructured observation it is crucial to have a system which permits you to capture information unambiguously and as faithfully as possible.
- Make a note of your observation on the spot. This may be condensed, using abbreviations; it will act as an aide memoir.
- Your record of observations needs to be gone through shortly afterwards to add detail and substance and to ensure that the record is understandable and says what it intended to say.
- Five types of material should be included in your record of observations. You should have a system to mark and separate out these different types of material (e.g. round brackets, square brackets, different colours, etc.):
    1. Running descriptions
    2. Recalls of forgotten material that comes to you later
    3. Interpretative ideas—notes offering an analysis of the situation
    4. Personal impressions and feelings—your subjective reactions
    5. Reminders to look for additional information
- If possible, persuade a colleague, a Classroom Assistant, or your friendly Educational Psychologist, to carry out an observation also. The different perspectives, and subsequent discussions, may lead to further insights and refine your hypotheses or findings.

Resources:

Frederickson, N. & Monsen, J. (1999). The Learning Environment. Psychology in Education Portfolio. NFER-Nelson.

Further Reading:

Blythman, Macleod, & Ciesla. (1989). Classroom Observation from Inside. Spotlight 16. SCRE.

Robson, C. (1993). Real World Research. Oxford:Blackwell.

Simpson, M. & Tison, J. (1997). Using Observations in Small Scale Research: A Beginner's Guide. SCRE.

7 Self-completed questionnaire

The great advantage of questionnaires is their potential to get information from a large number of people in a very short time. Questionnaires could be distributed to all pupils and/or all parents in the school, but using them in just one class could also prove useful. If the questionnaire is well constructed, the analysis could also be time efficient.

There are disadvantages as well that need to be considered. The information you receive is likely to lack depth or subtlety, and you cannot check if the answers are truthful (unless you do some selective follow-up interviews). If you send questionnaires out (to parents, for instance) there is no guarantee you will get them all back, and those who do return them may not be representative of the group as a whole.

For you to get any meaningful information, it is essential you get the design of the questionnaire right. This includes clear and unambiguous instructions, careful wording of the questions, and a topic that your target group will be interested in.

Studies suggest that it is important to consider the following suggestions:

1) **Use specific questions rather than general ones.** General questions are more subject to interpretation. When phrasing your question, consider the kinds of answers are you looking for, and how long and detailed you wish the answer to be. For example:
What do you enjoy most during play time? (possible answer: 'Playing with M', which is not what you meant). Instead use something like:
Which of the following help you most enjoy your play time? (show list)

2) **Use closed questions rather than open questions.** Unless you want rich descriptions, it is usually better to avoid questions starting with 'how', 'what' and 'why'. Although rich descriptions give a lot of information, they are very time-consuming and difficult to analyse. If possible, use questions with *'Do you…?'* or *'Have you…?'*

3) **Offer a 'non-opinion' option when appropriate.** Do this especially when getting information from adults, so that you do not force an answer when, in reality, the person who is completing the form has never really thought about it. It is possible to offer this 'opt out' in your general instructions. (e.g. *'Yes/No/Don't know'*)

4) **If using choice questions, it is better to avoid 'agree/disagree' options.** Research shows that most people avoid the 'disagree' option if they do not feel strongly about something. It is better to use a scaled question (also see Likert Scales), or specific choices such as:

For parents' meetings, would you prefer:
a) an appointment system organised by the school
b) an appointment system where you phone to arrange
c) an open system where you decide when to turn up.

5) **Consider your wording carefully.**
   - Keep the words as simple, jargon-free and unambiguous as possible, and keep the questions short.
   - Take into account the reading ability of your target audience (as well as writing ability, for that matter). With young children, for instance, it is preferable to use pictures (such as smiley face, sad face, etc). With pupils, generally, it is useful to read the questions through with them.
   - Try to avoid leading questions such as: 'What did you enjoy about the new maths programme?' (The pupil may have hated it). Either use: 'Did you find the new maths programme….(list options)?' or 'Did you enjoy the new maths programme? If so, what did you enjoy most?'
   - Try to avoid bias. You may be eager for positive feedback and your questions may reflect that. Look at it from the point of view of the pupils/parents/colleagues – what might they want to say?

6) Consider the order of your questions. Use general questions before specific ones. People are influenced by the previous question, so try and establish a 'natural' progression.

7) Distribute questionnaires promptly. People generally, and young children in particular, may not have a clear opinion about something that happened months ago. Time the distribution for when the issues you are investigating are still fresh in the mind.

Some further tips and suggestions

Incentives (such as a pupil writing a personal letter accompanying the questionnaire) and **rewards** (giving the pupil a sticker or small sweet on return of the questionnaire) may improve **returns**.

When using questionnaires to measure attitude changes, or with self-assessment questionnaires (e.g. for measuring self-esteem, motivation, etc), remember that **developmentally**, young children's moods change all the time, from moment to moment during the day. Such measures are therefore unreliable. From age 6 or so, sociometric information tends to be more stable.

Ideally, design a questionnaire **with a colleague**, or at least run it past a few 'critical friends', including your educational psychologist. It is also advisable to **pilot** the questionnaire with a small group. The responses you get will give you some idea about which questions may require slight alterations.

Depending on what you are investigating, you may deliberately decide to end your questionnaire with two or three open-ended questions. These can sometimes throw up unexpected results that can then be further investigated.

A questionnaire can be a very effective and efficient tool when used in combination with other tools, such as statistical information and a small number of interviews.

Further reading:

Munn. P. & Drever, E. (1990)
Using questionnaires in small-scale research: a teacher's guide. Edinburgh: SCRE.

8 semi-structured interview

The semi-structured interview is the most common form of interviewing. In it, the interviewer has worked out a set of questions beforehand, but intends the interview to be conversational. To do so, the interviewer can change the order of the questions or the way they are worded. He or she can give explanations or leave out questions that may appear redundant. So, the main job is to get the interviewee to talk freely and openly while making sure you get the in-depth information on what you are researching.

To do so effectively, you must remember to:

1) **listen,** not talk yourself. It is easy to get involved and share your own experiences and views, but this may influence your interviewee to change what they are going to say. (They may use what you say to guess what you would like to hear, rather than what you need to hear).

2) **Make questions short, straightforward and clear,** otherwise the interviewee may only remember part of the question. E.g., avoid questions such as 'How do you feel about our current reading scheme compared to the one you had as a pupil?' (It is better to ask: 'What do you think of our reading scheme?' Then follow it up by: 'How does that compare to the one you had as a pupil?'). Avoid jargon. Avoid choice questions, such as 'Is it better to have a parents' evening or to send reports' as the interviewee may not like either. Avoid leading questions such as 'Why do you like phonics?' (perhaps they hate it).

3) **Remain neutral.** Do not say 'good' or 'oh dear' depending on whether you like the response or not. Instead use 'mmhmm', 'OK, so what you're saying is…' or 'Thank you, can I now ask you….?', etc.

4) **Enjoy the interview** (or look as if you do). Sit up, look interested, smile and keep good eye contact.

5) **Use probes and prompts** to get as much information as possible. Probes can be silence (while nodding encouragingly), 'mmhmm', 'Anything more?' or repeating what has been said. Prompts are short supplementary questions such as 'And what happened next?', 'Was that true when you were at school?', 'Does that just happen during the reading lesson?', 'What do you think personally?' etc.

6) **Take a full record of the interview.** The simplest would be to record the interview (but be prepared for the technology letting you down). Although note taking can be cumbersome, and slow down the interview, it allows the interviewee to (re)consider what has been said while you write and expand the answer. A good technique is also to check up after you have written the notes: 'What I have written down is… Have I noted that down OK, or do you want to change something?'

It is also important to structure the interview properly:

Step 1:
Introduce yourself, explain the purpose of the interview, ask for permission to record or take notes, and explain confidentiality, length of interview, etc.

Step 2:
'Warm up'. Ask some easy, non-threatening questions at the start to break the ice and make people feel comfortable.

Step 3:
Carry out the interview in a logical progression. Start with the easier, more general questions (if possible) and gradually move to more in-depth or 'risky' ones. (This way you will have gathered some information should the interviewee refuse to continue). Do not hesitate to return to earlier responses if a topic is missed or answered half-heartedly, once you feel the interviewee is warming to you.

Step 4:
'Cool off'. Some straight forward questions at the end to relax the interviewee.

Step 5:
Show appreciation and say goodbye. Remain alert to the 'half-way out the door' confession, once the recorder is switched off. Often, this is when the most meaningful information is given, and you may want to use it. It would only be fair to inform the interviewee of this, if you do.

Interviewing is a skill, but appearance is also important. Be pleasant and dress appropriately. Remember that the interviewer is in control of this 'conversation', by setting the questions, and that the interviewee will try to please. Saying as little as possible and encouraging the interviewee to say as much as possible is the key to getting in-depth information.

N.B. To counterbalance interviewee bias (i.e. the interviewee trying to say the 'correct' answer), researchers often use focus groups, where the dynamics of a group influence responses.

It is the quality that counts.

Further reading:

Powney, J. and Watts, M. (1987),
Interviewing in Educational Research. London, Routledge & Kegan Paul

Rubin, H.J. and Rubin, I.S. (1995),
Qualitative Interviewing: The Art of Hearing Data. Sage

9 sociometrics

Sociometrics is the study of interpersonal relationships within social groups. It can be used to identify and track behaviour within groups, with a view to improving relationships. It may be a useful methodology to explore levels of 'inclusion' experienced by pupils who have special education needs.

One way of doing this would be to get all pupils in a group/class to complete a sociometric questionnaire such as 'Like To Play With' (Fredrickson & Graham, 1999). This is suitable for pupils aged seven and above, and takes about 20 minutes of class time. Results would show specific profiles for each pupil. These would indicate whether a pupil is 'popular' or 'rejected' by peers in comparison to the 'average' profile by providing a sensitive and convenient measure of social acceptance.

Such information is likely to be useful in identifying and assessing how 'included' each pupil feels. This would be particularly useful in the case of pupils with special education needs, where the possibility of social rejection and victimisation of mainstream classmates is a concern.

If difficulties are identified through this process, follow-up methods should be used, as sociometric questionnaires do not throw any light on the reasons for social rejection to occur. Such questionnaires are best regarded as having screening, monitoring and evaluation functions.

Suitable follow-up methods may be: teacher, peer and self-ratings of behaviour; an assessment of the rejected pupils social problem solving skills; a measure of the social ethos of the classroom or an assessment of teacher and peer attitudes and attributions. You could also refer back to the original children's sheets to answer pertinent questions such as:
'Who is the one child who accepts James?' (a rejected child)
'Have any popular children given James an OK rating?'
Answers to questions such as these can assist you in designing programmes to help children who are experiencing social difficulties.

Once your programme has been up and running for some time you can use the sociometric techniques again to evaluate the programme's effectiveness in improving the social acceptance of rejected children. Sociometric questionnaires can be designed to suit your action research project or accessed via established resources (Fredrickson & Graham, 1999).

Teachers are sometimes concerned that asking pupils to provide information about those members of the class with whom they least prefer to associate will itself have a negative effect on the acceptance of some pupils. Research to date indicates that this is not the case (Hayvren & Hymel, 1984). However, such studies emphasise the importance of confidentiality and strongly recommend that researchers and practitioners using sociometric questionnaires pay close attention to this.

References

Dane, F., C., (1990). Research Methods. Pacific Grove Brooks/ Cole

Fredrickson, N., & Graham, B., (1999). Social Skills and Emotional Intelligence in N. Fredrickson and R.J. Cameron (Eds.). Psychology in Education Portfolio. Windsor: NFER-Nelson

Hayvren, M., & Hymel, S. (1984). Ethical issues in sociometric testing: The impact of sociometric measures on interactive behavior. Developmental Psychology, 20, 844-849

10 standardised assessment

There is a wide range of assessments that can be used in the school setting. Standardised assessments offer the benefit of gaining objective information about a pupil's performance. They achieve this by demanding that they are administered and scored in a uniform way. Most of them are commercially available and therefore easily accessible – at times with a scoring service included!

Most standardised assessments are norm-referenced. This means that the test materials have been piloted on a large representative sample of the whole (school aged) population. The test pack usually comes with a manual that outlines the backing data on sampling, reliability and validity statistics. The rule of thumb is that the more pupils were included in the pilot, and the greater the 'spread' (age, socio-economic status, geography), the wider its applicability. A sound 'standardisation' allows subgroups (or even individuals) to be compared with the whole population. As such, it allows comparison of a class, school or local authority with the whole country, to consider if pupils are achieving as expected.

Advantages of standardised tests:

1. objective
2. piloted and refined
3. standardised across a named population (region, whole country, particular age group, various age groups), so that they represent a wide grouping
4. manual declares reliability and validity for particular purpose
5. useful for statistical analysis
6. gives instructions for administration
7. straightforward and easy to mark
8. guides to interpretation usually available

Standardised tests can be used with individuals, and are probably most useful and reliable when measuring performance differences in two ways: 1) between students (e.g. to rank performance in spelling in a class), and 2) within the same student(s) at different points in time (e.g. to see whether a reading intervention worked). If a pupil is only tested once, it is advisable to use the so-called confidence band. A pupil's 'true score' will reliably fall between the two extremes of this band.

Although more recent tests will ensure there are bilingual children in their representative sample, standardised tests can be criticised for not taking into account context or individual differences, such as whether a pupil is feeling under the weather, forgot his glasses, or English is his third (and most recent) language. If the same test is used for a repeat measure, a pupil may do better because he now knows what the test is about, not simply because he has learned more. This, of course, depends on the kind of test.

There is a wide range of standardised tests. In schools they are usually either achievement tests (reading, number, spelling and vocabulary tests) or aptitude tests (CAT, WISC, etc). There are tests for whole class groups, and for individuals – or both. But there are also screening tests (e.g. PREST), diagnostic tests (DST, Quest), readiness tests, skills tests (e.g. Phonological Assessment Battery or 'PHAB'), reasoning tests (e.g. Raven's Progressive Matrices) – to mention a few. Check the catalogues of NFER-Nelson and Hodder and Stoughton Educational to find the tests that suit your purpose. The most important consideration is to be certain whether the objectives and content of the published tests match the purpose, objectives and content of your evaluation. A published test such as the Edinburgh Reading Test may not address the areas of reading that you intend to cover, or may contain language that is too difficult for a bilingual reader. Equally, a low score on an achievement test such as the Mathematics Attainment Test can not be seen as indicative of aptitude. Similarly, a diagnostic test such as the PhAB cannot be used to test for reading progress. If you decide to devise your own test (and why not), you may find the relevant chapter in *Research Methods in Education* helpful. Fitness for purpose is the key.

Note that some standardised tests are on restricted release or availability, i.e., they can only be used by trained assessors such as Speech Therapists or Educational Psychologists. If you wish to make use of such tests, discuss this with your Educational Psychologist.

Reference:

Cohen, L., Manion, l. & Morrison, K. (2000). Research Methods in Education. (5th Edition). 321-336.

11 statistics

Descriptive Statistics
Descriptive statistics are relatively straightforward to use and are employed already in most schools, often to establish if any changes have taken place. For example, how many pupils can do mental arithmetic using numbers up to 20? How many more pupils can do this at the end of the school term? How do their scores compare to the group that did written sums only? What percentage of P3 pupils have passed level B writing?

What follows is a more advanced description of how statistics can be used in action enquiry. It is anticipated that to create an action enquiry requiring this level of sophistication you will require additional support, perhaps from the Psychological Service or someone in your school with expertise in research design.

Statistical Analysis
To gauge whether any difference in pupil scores are a result of the intervention, and not due to chance fluctuations in performance, or other factors (such as individual pupil factors, time elapsed, the way the scheme was administered) more sophisticated analysis is required.

In depth statistical analysis relies on your action enquiry project having certain characteristics in its research design. Elsewhere in this booklet you will find information on control and comparison groups, matching pupils and sampling. These factors need to be considered if you want to analyse your results statistically. If your research design is robust enough, you may be able to administer statistical tests.

Statistical Probability
Statistical analysis of data involves rejecting or retaining a 'null hypothesis'. Don't worry! Every research design has a null hypothesis; basically this hypothesis states that the intervention has had no effect. For example, when comparing the effects of a new reading package claiming to improve pupil performance the null hypothesis would state that the pupils in class A (who received the new reading package) and class B (who didn't) have the same reading test scores (e.g. the new package makes no difference). The alternative hypothesis (sometime called the research hypothesis) is that the two classes will have different reading test scores with class A having the higher. If your intervention has been successful you want to categorically reject the null hypothesis.

In order to be really sure about your decision to reject or retain the null hypothesis you must complete an inferential statistical test. These tests submit your results to a test of significance in order to gauge whether the difference you have observed is to be counted as a genuine effect (support the research hypothesis) or dismissed as likely to represent a chance fluctuation (support the null hypothesis).

Significance tests can inform your decision because they calculate the probability obtaining your result if the null hypothesis is true (e.g. no effect). The probability of events occurring is measured on a scale of 0 (intervention has had an effect; null hypothesis is false) to 1 (intervention has had no effect; null hypothesis is true). Social scientists reject the null hypothesis when the probability of an event occurring is less that 0.05. This is often called the '5% significance level' and is written as $p<0.05$. If a statistical test calculates a probability of less than 0.05 you have a statistically significant result (you can reject the null hypothesis) i.e. the result has not occurred by chance and can be attributed to your intervention.

There are many inferential statistical tests that have to be chosen to reflect various factors in your research design (such as sample size, what type of data you have).

Support for doing statistical tests

There is an excellent computer programme that can be accessed through Psychological Services called SPSS ('Statistical Package for Social Sciences'). This can perform all arithmetical functions and statistical analysis required. However, the package does not analyse which test it should run; this has to be determined by the researcher/teacher. This need not be of great concern because many publications give excellent guidance. It is important not to get bogged down in statistics however, if you would like to use statistics you need to plan your action enquiry carefully so that you collect the kind of data which can be analysed statistically. Often the researcher collects data then discovers it cannot be used for statistical purposes.

Further Reading:

For SPSS: Bryman, A, & Cramer, D. (1990). Quantitative Data Analysis for Social Scientists. London: Routledge

Brace, N. Kemp, R. & Snelgar, R. (2003). SPSS for Psychologists: A guide to data analysis using SPSS for Windows. (2nd Edition). Hampshire. Palgrave Macmillan

Cohen, L., Manion, L. & Morrison, K. (2000). Research Methods in Education (5th Ed). London: Routledge Falmer

Pilcher, D. M. (1990). Data Analysis for the Helping Professions: A practical guide. London: Sage

Robson, C. (1983). Experiment, Design and Statistics. London: Penguin

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