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# Accessing and understanding research in education

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Accessing and understanding research in education

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## Introductory comments

This chapter describes the range of evidence that exists relevant to educational studies, and discusses how to locate, read, and use such evidence. The evidence exists in publicly available datasets as well as in the writings of others. The chapter introduces some generic methods of assessing the quality and usefulness of evidence, including a key quality control principle. The chapter ends by outlining some ideas for future research.

## The scale of research evidence in education

In all developed countries including the UK, and most other countries, education is a huge industry. It is increasingly lifelong, from cradle to grave (or more formally from pre-school to adult learning in the third-age). It is society-wide, taking place in families, schools, colleges, prisons, the workplace, libraries, on-line, and in numerous informal settings. Education is also the only major area of public policy which is compulsory for all citizens – hospitals are for the unwell, prisons are for offenders, benefits are intended for a disadvantaged minority, and so on. But everyone is required by law to attend school, or to make equivalent arrangements at home. And education is held responsible by policy-makers for a bewildering range of phenomena including the economy (a trained workforce), social mobility, social cohesion, and social justice. So, although education research is only a small part of all this education it is still a large undertaking itself. There are more education researchers in the UK than in any other field or discipline (Gorard et al. 2004).

Education research in the UK is funded by central and local government, by near-government bodies like the Qualifications and Curriculum Authority, the Teacher Development Agency, or the Learning and Skills Council, by research councils such as the Economic and Social Research Council, by learned bodies such as the Royal Society or the British Academy, by think tanks such as the Social Market Foundation or the Institute for Public Policy Research, by practitioner bodies such as the NUT or ATL, by large charities like the Nuffield Foundation, Gatsby, or Joseph Rowntree, by individual benefactors such as the Sutton Trust or Bowland Trust, and by many of the same kinds of bodies in Europe, the USA and worldwide including the OECD, the EC Directorate for Education and Culture, and the Spencer Foundation. The research is conducted by these bodies themselves as well as by academics, practitioners, and increasingly by private consultants.

This means that there is a vast amount of data collected on education, and a vast amount written about education research. For any topic, as broadly conceived, the first problem you will face is how you will manage the scale of that evidence.

## Looking for research evidence

*A hierarchy of evidence*

Primary evidence is based on first-hand data that you collect yourself (the subject of Chapter 22). This has the advantages of being new, fresh, directly relevant to your own area of investigation, and more easily comprehensible to you. Primary evidence has the disadvantages that it is likely to be small-scale due to lack of time and resources, it could be biased by your selection of the cases to be involved, and will often anyway be a replication of evidence already collected by others.

Secondary evidence is based on existing data collected by others. Where you can gain direct access to the evidence collected by others this often allows you much larger-scale data, but still with many of the advantages of primary data. For example, if you wish to find out whether the number of applicants to study undergraduate mathematics at universities in the UK has been going up or down in the last 10 years it is difficult to imagine that you could collect better data on this than the Higher Education Statistics Agency (HESA). HESA makes this data available to all would-be analysts (see below). A fantastic range of existing evidence is available on almost all education studies topics. Such secondary evidence has the disadvantages, for you, that it was usually collected for another purpose and so may not be ideal, that you have no real idea of the conditions under which the data was collected, and you may therefore be misled about its completeness and accuracy. Nevertheless, when considering an educational issue, secondary evidence is usually at least as useful as primary evidence, and much cheaper to get hold of (Gorard 2001).

Where primary evidence is not possible, and secondary evidence is not available, it is also worth considering the conclusions of others, drawn from their own analysis of primary or secondary data ('tertiary' data if you like). But remember, whatever the flaws and limitations of any direct evidence (primary or secondary), these are made worse by being summarised at third hand. One has only to read two different newspaper accounts of the same governmental policy announcement to see the truth of this. The accounts may be contradictory and such contradictions may only be resolved by reading the announcement for yourself. This principle is widely misunderstood in education studies, where new authors rush to repeat the *opinions* of others, when it is just as easy to read that author's evidence at first-hand and come to your own opinion. Any author summarising their evidence faces exactly the same flaws and relative disadvantages as you would when reading the evidence itself, but they put you at the added disadvantage of only 'seeing' the evidence through their eyes. This does not mean that we should not read the accounts of others. My purpose here is to illustrate the dangers of relayed and packaged information for those seeking a greater understanding of education, and to recommend the use of direct evidence wherever possible.

One advantage of reading about evidence at second-hand is that it might allow you to use a larger number of studies and datasets in any given time period. This advantage occurs especially when you have access to a synthesis of evidence from than one source, such as might appear in a meta-analysis or systematic review.

Reports of single studies are therefore towards the bottom of the hierarchy of useful evidence. They are valuable but require considerable time to use effectively, and lead to an increased danger of being misled by a poor quality and un-replicated study. For

some reason, reports of primary research often give very little detail about the evidence uncovered. It should be a simple matter to provide the relevant research instruments, full transcripts of interviews, spreadsheets of responses, and so on, either as appendices or as linked websites. This kind of good practice is still only attempted by a minority. Many research reports make quite bold claims illustrated by selective interview quotations or tables, in such a way that readers are unable to judge for themselves whether the claims are warranted by the evidence. Just because the author claims that something is so does not make it so. Your task as a reader of evidence is to make critical and informed judgements about the relative quality of different sources of evidence, and about the conclusions others have drawn from this evidence. In order to complete that task you must have reasonably good access to the evidence, and providing that access is part of the task of the author. Where an author does not create that access through the clarity of their writing they are failing in that basic task. It is then quite rational for you to cast doubt on both their evidence and their conclusions.

Beware also of articles that look like summaries of evidence, but which are mere opinion. Reviews of literature in a number of fields report encountering a large number of papers published in peer-reviewed research journals that contain no direct accounts of evidence at all (Gorard et al. 2007). Perhaps one-third of all education 'research' publications are thought pieces, and of course some of these are valuable. There are discussions and debates about innovative research methods, and the occasional piece with a new idea that has the power to completely change the way we look at a topic. However, far too many are largely pointless theorising or posturing. Do not mistake the opinion of others for evidence, however important the source and however forcefully expressed.

To recap, there are at least five different ways of uncovering apparent evidence on a topic. Direct access to primary and secondary evidence are the best and most secure routes. Failing these a rigorous synthesis of available evidence, performed by someone else, is a time-saving and useful alternative, as long as the quality of the synthesis is made clear and the route (or audit trail) to the primary data is available for interested readers. Failing this you can produce your own rigorous synthesis of the evidence published in single studies. You may also find useful techniques and approaches in published articles with no evidence in them, but do not mistake these for evidence of any kind.

*Searching for secondary evidence*

Once you have opened your eyes to the possibility of using existing data, rather than just reports about existing data, the difficulty is not so much whether what you want exists but where you can find it. I suggest some likely sources here for illustration, but the details of internet resources are likely to date rapidly, and to vary between countries.

An obvious place to start your search for existing data is the national UK Data Archive (http://www.data-archive.ac.uk/). This is, or should be, a repository of all datasets generated through research paid for by the taxpayer-funded Research Councils (such as the Economic and Social Research Council), and from a number of other sources. It includes historical archives, policy and other documents, and transcripts of interviews undertaken as part of previous research projects. Some of it is

relevant to education studies. You can register for access to these resources, and then reanalyse the evidence for your own purposes. The National Digital Archive of Datasets (http://www.ndad.nationalarchives.gov.uk/) similarly contains a fantastic array of data – perhaps most obviously a database of the annual schools census for all schools, undertaken in January each year, collecting data at school level on pupil intake characteristics (poverty, special needs, ethnicity, sex, first language) and on the teaching and support staff. Linking such school characteristic data to the corresponding records of school examination entry and attainment is a very powerful approach. The Department for Children, Schools and Families has a website full of data on all aspects of school and childhood, including an archive of examination and key stage results for each school up to the current year (http://www.dcsf.gov.uk/performancetables/).

If you want comparative data, or to place your evidence in an international context then the OECD website has a wonderful collection of educational evidence, including the annual Education at a Glance, and the results of successive rounds of the international PISA study. The most recent PISA study at time of writing was in 2006 (http://pisa2006.acer.edu.au/), and the database includes the views of teachers and students, student test results in a range of subjects, and school-level data. It can be downloaded from the website, giving records for individuals within schools, in around 80 countries. For more on where to find data and how to analyse it, see Gorard (2001).

One of the many websites with downloadable data about post-school education is the Higher Education Statistics Agency (http://www.hesa.ac.uk/). Here you can find an archive of applications and admissions to higher education, and discover changes over time or regional variations in what kind of students study what kinds of subjects at university, for example.

The (Office for) National Statistics is a one-stop shop for evidence on almost anything. It includes evidence at small area level on all ten yearly national censuses of the population, most recently from 2001, and next run in 2011 (http://www.statistics.gov.uk/census2001/topics.asp). Here you can find such things as the highest educational qualification of everyone in the population aged 16-74, broken down by sex, age, area of residence, type of accommodation, health, religion, occupation, marital status, and so on. You can also request bespoke tables and specific analyses. It is a public service.

These few examples really only touch the surface of the local, national and international datasets made available specifically so that you and I can use them for our own purposes. Whatever you want to know about education it is very likely that someone or some department of government has already collected the evidence you need on a far grander scale than you would be capable of. Perhaps the most original new use of these existing datasets lies in combining evidence from two or more in a way that has not been done before. I have already pointed out how useful it is to use the schools census data on pupil intakes to help explain and understand the DCSF figures on school attainment. This is a well-known link. What about others that you could be combining for the first time? Can you imagine linking the schools data with the HESA data – who is missing out on university? Or the population data with the schools intake data – do schools represent their local residents? Or whether pupil

views on citizenship (from PISA 2006) are related to the type of school they attend (schools census)? One of the many interesting projects I have conducted involved comparing present day stories of adult learning with those in the taped oral archive of families living in the South Wales coalfields in the 1890s (Gorard and Rees 2002). The possibilities are endless, but largely ignored by UK scholars who just do not seem to realise this potential, and continue with their small-scale and often pointless recreation of these same bases of evidence.

*Searching for tertiary evidence*

What about searching for research literature? I propose two main methods. Whatever else you do, do not start your review of the research literature by using a book or books. Books recounting research evidence are, by definition, out of date. They take some time to write and a long time to get published. A book dated 2008 probably only refers to other literature up until 2007, and will be based on primary evidence collected in or before 2005. They will only give a partial picture. To get a much more recent and more complete list of research reports relevant to your topic you need to visit one or more of the databases maintained for precisely that purpose. As with databases of existing evidence it is shocking how few scholars use these resources. For example, the British Education-line holds a vast database of complete reports available to download and read (http://www.leeds.ac.uk/bei/). Many of the reports are what is termed 'grey literature', meaning that they are like pre-publications. They are less prestigious than journal articles in some people's eyes, but they compensate for this by being more up to date. It takes almost as long to get a journal article published as it does a book (longer for some journals). But Education-line can receive an electronic paper and put it up the same day.

An even wider literature on education is available to search at the Education Resources Information Center (http://www.eric.ed.gov/), and at PsycINFO (http://www.apa.org/psycinfo/). These do not always lead to a complete text, but usually to an abstract, keywords, and full bibliographic reference. You can then use the reference to find the full text in your library or on the internet, if the abstract sounds as though the piece is really relevant to your own work. A key advantage of the electronic search engines for these databases and others like them is that as well as searching by titles and authors you can search for terms or phrases appearing in the documents, and you can combine all of these with Boolean logical operators like AND, OR and NOT. The precise instructions for doing this vary with each database, but imagine you were interested in bullying at school. You might search for 'bullying' and get thousands of hits (documents containing the word bullying). You then refine your search to look for 'bullying' AND 'secondary school' AND 'Scotland', and this reduces the hits only to those documents that mention all three search terms. It takes a few goes to get enough hits but not too many. It is very similar to using Google. Talking of which, Google has a specialist search engine called Google Scholar used for looking at academic writing in particular, which can be very useful (http://scholar.google.co.uk/schhp?hl=en&tab=ws). A final example from the many databases of research publications relevant to education is the Campbell Collaboration (http://www.campbellcollaboration.org/). This contains systematic reviews of evidence on almost every imaginable topic in formal education, and reports of randomised controlled trials of educational interventions.

In addition to these resources it is always useful to conduct a smaller search of your own. You might start with the electronic library in your own institution which has access to a number of research journals. However, these are usually organised for the benefit of someone who knows what they are looking for (such as you, once armed with a list of useful references from the ERIC database). I find a better way of finding material at the very start of a new search is to visit the library in person (it also makes a nice change from using the computer). Your library probably has hard copies of the most up to date issues of each journal lying face out on the shelves. You can walk along the education shelves, picking up each journal that might be relevant and reading the list of contents – usually on the back cover. Some of the most useful journals at this stage are the generic ones covering a whole range of issues, such as the British Educational Research Journal, Oxford Review of Education, Cambridge Journal of Education, and so on. Scan the list of contents and turn to the page for any paper that looks relevant. Read the abstract and decide to note the reference or discard it. Remember that any article does not have to be specifically about your topic. Nor do you have to use all of any article. An article might give you an idea, a description of a method, or a way of writing or presenting evidence, as well as or instead of substantive information about your topic. Perhaps the most valuable resource will be the references cited in each article. This is why you start with the most recent journals. Any paper can only cite prior papers, so if you start with last year you are going to miss the most recent evidence. You use the first set of articles to daisy-chain back to further articles, books and reports. Coupled with a search of electronic databases this should give you a fairly accurate picture of the state of evidence in your field.

Also consider looking at student theses if these are available in your library. Masters and doctoral dissertations are usually on the shelves. And remember that if a crucial paper or book is not in your library they will probably order it for you (most libraries are desperate for suggestions) or they can get it via inter-library loan. Remember also how the library catalogue system works. If you go to the shelf with the classification mark for the book or report you want and it is not there, all of the other nearby volumes will, by definition, be on similar themes. They might be even better than the one you were looking for.

Once you have located a useful publication or piece of information, ensure that you note down the full bibliographic or website details at the same time - including the date of access for websites, and the page numbers for any direct use of evidence or quotations. You do not want to waste time looking for the citation details again later when you come to write an assignment or dissertation. Incidentally, your course or institution will have an agreed set of standards for how you cite and list references in your work (such as Harvard, Chicago or Oxford). It is a really simple matter to master these rules early on, and it is a surprise to me that so much time is wasted in incorrect or incomplete references. Save your anarchic protest for something more substantial.

**Consuming research evidence**

Clearly, having located some useful evidence in whatever form, you must now read and understand it. Mere possession of a photocopied article or a library-loaned book is of no use. So this is not the time to relax. On the other hand you do not need to read

all and everything you locate. In the same way as you will exclude some material at first glance as being irrelevant or too dated, so you will come to realise that some the material you have retained is not as useful as you first thought. Skimming the abstract, conclusions and references of a published article can help you decide whether to read further. Using the list of contents and figures and preface in a book can help you decide which, if any, chapter to read. Academic work is not like a detective novel designed to be read in order, in full, and once. You can start at the end and work backwards. Sometimes you need very little from a reference – perhaps all you glean from it is that there is a debate about some topic. In this case it is perfectly proper to cite the reference as simply showing the existence of the debate. In this case, you are truthfully pointing out that the debate appears in the paper. As soon as you go further than this and venture an opinion or even implicit support for one side in that debate then you need to have read the paper much more carefully.

It is important for you to realise that the publication of education research has no real quality control. Weblogs and wikis are written by individuals with differing approaches to the truth, and cannot always be relied upon to give factual information. In the same way, electronic papers and pieces linked to websites, even those of well-known academics, cannot always be relied on. It is what they report that matters, not where they appear or who wrote them. The major attempt at quality control in education research comes from peer-review. In top journals, papers submitted for publications are sent without identifying information to two or more other academics for their comments and advice on whether to publish. Several problems arise. Innovative and controversial papers are likely to be rejected, while anodyne ones that do not threaten the status quo are accepted. There is sometimes clique review, where a group of academics working in the same area review and approve each others work to advance their own careers. There is sometimes competitor review, where a group of academics combine to inhibit the publication of work that is critical of their own approach. The journals are businesses that need a supply of papers to be published and so their ‘standards’ vary with time, popularity and the number of papers they receive for review. There are other attempted quality controls in education research but they are also defective. This is clear from reading almost any journal carefully. The papers in it will be mostly a combination of the anodyne and unexciting, poorly written and crafted, illustrating weak research and drawing unjustified or illogical conclusions.

This last passage should give you a few clues as to how to do your own form of quality control. For example, the author of any education research paper is writing to tell the story of their research to you and I – and people exactly like us. If, after careful reading, you do not understand what the author is saying, what the evidence means or how their conclusions follow from the evidence then the author is generally the one at fault. It is not only bad manners to treat their readership like that. It is also suggestive of flaws in their own logic or research that they are attempting to cover up by obfuscation. I find that, in addition to the one third of papers I read that contain no evidence or new ideas (see above), around another third do not make sense at all. But rather than ignoring these problems, why not join me in pointing this out when you write your summaries of evidence or literature reviews? Explain which or how many papers were vacuous and which were impossible to read.

For the minority of pieces you come across, which contain substantive reports of evidence *and* are explained clearly for their intended audience, try applying the following quality control principle. If the conclusion(s) of each report were not actually true how else could we explain the evidence they found? This simple-sounding question is actually a very powerful discriminator between good and bad research (Gorard 2002). Imagine a study providing evidence that school pupils today report high levels of stress, concluding that school life today is more stressful than in previous decades. The author then begins to suggest explanations for this change – such as increased pressure of exams or shorter break times. Apply the principle. If it were not actually true that school life today is more stressful than in previous decades then how could we explain the evidence that pupils today report high levels of stress? There are many explanations that would fit. Most obviously, perhaps pupils would always have reported high levels of stress. The author is making a comparative claim without the necessary comparator (the levels of stress from previous decades). Yet this is a real example written by a professor of education in a UK university. It is rubbish, but it was written in all seriousness, peer-reviewed (for quality control) and then published. Unfortunately, this is not some kind of freak outlier. This is the normal weak standard of education research.

Try another real example. A study is based on education lecturers at a university interviewing their trainee teacher students about what they think of the course. The evidence is that most students are complimentary about the course, and the researchers conclude that their course is good, and so begin to characterise what they do well on the course so that other institutions can copy them. Again, apply the principle. If the course were not actually that good, how else could we explain why the students reported that they were happy with it? Again, there are numerous explanations. One obvious one is that the lecturers were not just the researchers; they were also the people who decided on the students' results, and this inhibited critique. Yet this study was also peer-reviewed and published without consideration of this apparently key point by the authors, peer-reviewers or journal editors. There is no decent quality control in education research. You have to be the judge of quality for each piece.

I would say that the majority of education research in the UK is vacuous, incomprehensible or fatally flawed. It is important for us as users of research evidence to be able to admit this so that we can discriminate and use more easily the minority of good research that does not have these flaws. Such research *does* exist and we should seek it out and treasure it. Of course, all research faces problems and requires the researcher to compromise. We are not looking, mistakenly, for perfection. We are looking, ethically, for honesty and scrupulousness. The problem with the two examples above and others like them is not so much with the evidence but about the dishonesty of the authors. The first author could have said that although they did not have evidence from previous decades, the levels of stress among pupils today were so high that they believed this to be a new phenomenon. This would a weaker but more honest conclusion. The second authors could have said we realise that our students may have felt constrained about being critical in front of us, but we did not have the resources to employ outsiders to conduct the interviews, and anyway the students did not have to be so complimentary. Thus, they might still conclude more honestly but much more tentatively that most students seemed genuinely happy with the course.

Being critical and cautious in the use of evidence is, ironically, more persuasive than being gung ho.

You will come across different kinds of evidence in databases, and different kinds of studies in the literature. Evidence may differ in scale, completeness, quality, age, methods of data collection and analysis. There is insufficient space here to discuss how to read, critique and summarise every type. Two general points will have to suffice. First, anyone genuinely concerned about evidence in education research cannot exclude any data or reports solely on the basis of their type or the methods used (Gorard with Taylor 2004). A synthesis of evidence must use all relevant available material. This might sound obvious but you will soon discover ridiculous and supposedly incommensurable schisms, often based on the q words 'quantitative' and 'qualitative', that encourage research users to focus on only a subset of available evidence. Don't fall into this trap. Second, at a general level all types and methods of evidence can be handled in the same way, using the principle above (for example), or using the same kind of common sense judgement you use in everyday life. If the writer does not make themselves clear, that is their fault. Education research does not, or at least should not, generally use any complex techniques beyond the comprehension of education studies students (Gorard 2009). If the author puts tables in their writing which are in fact the undigested output from analytical software and you do not understand the table, it is not your fault. If the author uses long and unfamiliar words, in lengthy sentences of low readability, again this is not your fault.

**Using tertiary evidence**

In general, your main use of existing evidence will be to synthesise it. Your task will be to report the overall picture of what we know about a specific topic. This means that you will have to convert what you have – often a list of references with notes attached – into a coherent story. This usually means changing the subject and object of the discussion. In note form, the subject heading may quite naturally be the author of the research report, while the topic takes a back seat. You need to avoid carrying this incorrect emphasis into your writing. One clue to this problem in any report is a sequence of paragraphs and sentences starting something like:

> Gorard (2002) claims that…… Gorard (2004) found that…..

Ensure that you avoid this error. Instead, make the topic of discussion the subject and use the references to substantiate your claims. For example:

> Is UK education research of the quality that the taxpaying public have a right to expect? It has many deficiencies according to Gorard (2002, 2004). These include…..

In this way as well as making the more important issue the topic of discussion, you can avoid repetition. If two (or more) authors or studies say similar things you can run their accounts together. Note that you should also avoid the opposite flaw of 'sandbagging', where each point or sentence is accompanied by a bracketed list of dozens of references. Sometimes, of course, you will make a deliberate choice to focus on one study for detailed discussion, not because that is how your notes were

taken but because it is interesting enough to be a topic in its own right. It may be a key finding, or a particularly innovative piece of research that appears to contradict the rest of the field. It is also often a very poor piece of research that you want to focus on, because it is not enough simply to disagree with something or to write it off as poor. If there is a study in your area that would be important if its findings were true but with which you disagree then you owe it to the author of that study and to your readers to explain why, in more detail. This means, of course, that when you are searching for and reading literature you do not throw away or ignore poor research. You use it to illustrate why your own conclusion is not going to take it into account.

Thus, summarising evidence is not simply a question of vote-counting. Intellectual argument does not rely, at least initially, on any kind of democracy. Ten studies may conclude one thing, and only two the opposite but the two studies may have the right answer. Perhaps the ten studies had not used the quality control principle and so had no comparator, or something similarly essential for making the claims they do. Maybe their support is circular, citing each other, and making it difficult to locate the primary evidence on which any original claim was based. And, of course, when summarising evidence and conclusions from evidence, the mere opinion of academic writers is irrelevant. It is for this reason, among others, that you should refrain from using extended quotations from the writing of others to 'support' your argument. What the writer says is not really any kind of *evidence*. You can summarise what they say if it is important (and incidentally therefore also avoid any appearance of plagiarism). There are a few occasions when you might want to quote another author directly. If you are going to dispute what they say then it is important to be accurate and so only fair to put their position in their own words (to avoid the 'straw person' error). And just occasionally a good writer has expressed what you want to say so perfectly, succinctly, or wittily that you quote them in admiration.

You should present your evidence as part of an argument. Evidence only becomes informative, rather than being dull facts, when placed in the relevant context of an argument. This argument might consist of a claim or conclusion that you want to draw, grounds for the claim, which is where your existing evidence comes in, the warrant linking the grounds logically to the claim, and any qualifiers and reservations (Toulmin et al. 1979).

**What kind of evidence is missing?**

I have been critical of the quality and usefulness of much education research, too much of which seems to have been conducted for the sake of it with no genuine curiosity or concern for the truth. It follows then that what I would like to see is far less of this 'fake' research and far more genuine attempts to answer explicit and relevant questions (Gorard 2004, 2005). I know that people find this plea unsatisfying since it is so generic, specifying neither topics nor methods to be used. But that is the situation we face. There is no magic bullet of methods or topic. Increasing the proportion of 'quantitative' research, having more randomised controlled trials, or more work on pre-school is not, in itself, likely to improve anything. Put another way, persuading a researcher who currently does sloppy work involving interviews with primary school teachers to undertake a sloppy questionnaire with secondary school parents, for example, will lead to no overall improvement in the quality of research.

Education really needs new people (you perhaps) who care much more about the quality of their research results. The sceptical quality principle – if the conclusion I want to draw were not true how else could I explain the evidence? – is of greatest help if we can persuade researchers to use it from the outset. At the beginning of a new study it would help researchers to consider the kind of evidence they would need in order to be able to draw the kinds of conclusions they want to (Gorard and Cook 2007.

Imagine that a researcher wanted to help decide whether some new kind of school (perhaps Academies in England) 'performed' better than the kind of school it replaced (perhaps the 'bog standard comprehensive'). The sceptical principle immediately reminds the researcher that they need a comparator. So they imagine comparing Academies with their predecessor schools. But even if the exam scores in Academies are higher than in predecessor schools it would be easy to find alternatives to the explanation that Academies therefore performed better. Many other things may have changed over time as well, including the prevalence of exam scores. Every year qualifications tend to rise across all schools (more students get more high grades at GCSE or equivalent, for example). So the question is not whether scores in Academies rise but whether they rise faster than in other schools or faster than they would have been predicted to rise in the predecessor schools. So now the reasearcher realises they need at least two comparators – the predecessor schools and the non-Academy existing schools. Another thing that might change over time is the student intake to the Academies. As a consequence of new building or extra funding perhaps the Academies are attracting a different kind of student. If these students have higher prior attainment at primary school than the previous student intake of the predecessor school then we would expect higher scores from the Academies anyway, even if they did not perform any better as schools. So we need to look not at the raw scores of students but at the scores of equivalent students in the three groups (Academies, predecessor schools, and existing non-Academies). And so on. All of this and much more becomes quite clear before the study takes place, simply by imagining how it would be possible to warrant a claim that Academies were or were not more effective than the kinds of schools they replaced.

Thus, we could avoid the kind of nonsense 'research' that fills most UK education research journals. Using such an approach both as authors and as reviewers of the work of others, it simply should not be possible for researchers to make comparative claims without a comparator, and other distressingly common errors. What I am talking about here is an emphasis on design. Design is not about the topic, approach, research questions or methods used. What we need more of is research in which these elements hang together logically in a coherent design (http://www.tlrp.org/capacity/rcbn.html).

I will end by suggesting just four areas in which I feel future research could be crucial, but this can only be a partial picture.

1. Rigorous teaching experiments (or design experiments) examining different techniques and pedagogies are essential to discover how to help students of all ages to learn best. At present research tends to be dismissed in favour of professional judgement (perhaps rightly so), but in the cumulation of small-

scale practitioner work with professional judgement we can hope for the best of both kinds of knowledge to work together and not in stand off.

2. Decades of work in the sociology of education tradition have shown that student background, including socio-economic status and prior attainment, makes a difference to school outcomes and beyond. But no one has satisfactorily addressed why this is so. Raking through data from the past can only advance the field so far. We need more genuinely evaluated interventions, to try and find out.
3. We all know that teachers make a difference, in comparison to not having a teacher. But it is also assumed that different teachers are differentially effective. If this is actually true it ought to be easy to establish via randomised controlled trials, and so provide pointers for the improvement of others.
4. Above all, we need to educate the potential users of evidence from education research about what evidence they can rely on and what they ought to ignore. Currently, academic writers on the impact of research seem to assume that all research is good and should simply be taken more account of. But practitioners and policy-makers, while paying lip-service to evidence-based approaches, actually ignore research because they know much of it is flawed. This stand off requires several changes, the most important of which is that academics start rejecting rubbish research and that users start recognising good research (Gorard 2008).

**Summary comments**

**Further reading**


Gorard, S. (2001) *Quantitative Methods in Educational Research: The role of numbers made easy*, London: Continuum

Gorard, S. (2002) Fostering scepticism: the importance of warranting claims, *Evaluation and Research in Education*, 16, 3, 136-149

Gorard, S., with Adnett, N., May, H., Slack, K., Smith, E. and Thomas, L. (2007) *Overcoming barriers to HE*, Stoke-on-Trent: Trentham Books

Gorard, S. (2004) The British Educational Research Association and the future of educational research, *Educational Studies*, 30, 1, 65-76

Gorard, S. (2005) Current contexts for research in educational leadership and management, *Educational Management Administration and Leadership*, 33, 2, 155-164

Gorard, S. (2008) Research impact is not always a good thing: a re-consideration of rates of 'social mobility' in Britain, *British Journal of Sociology of Education*, 29, 3, 317-324

Gorard, S. and Cook, T. (2007) Where does good evidence come from?, *International Journal of Research and Method in Education*, 30, 3, 307-323

Gorard, S., Rushforth, K. and Taylor, C. (2004) Is there a shortage of quantitative work in education research?, *Oxford Review of Education*, 30, 3, 371-395

Gorard, S., with Taylor, C. (2004) *Combining methods in educational and social research*, London: Open University Press

Gorard, S. and Rees, G. (2002) *Creating a learning society?*, Bristol: Policy Press

Gorard, S. (2009) All evidence is equal: the flaw in statistical reasoning, *Oxford Review of Education*, (forthcoming)
Toulmin, S., Rieke, R. and Janik, A. (1979) *An introduction to reasoning*, New York: Macmillan