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Ken Springer (2010) *Educational Research: a contextual approach.* Wiley, Hoboken, NJ. ISBN: 978-0-470-13132-9, Hardcover, 566 pages, price: £110.00 / €132.00.

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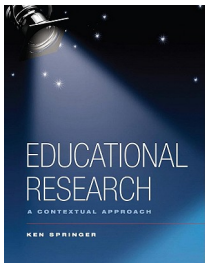

Ken Springer has written a new textbook for those wishing to learn about educational research, offering what he describes as a 'contextual approach'. For those who are familiar with courses that are designed to support the teaching of the sciences through context (Bennett, Hogarth, & Lubben, 2003), this raises expectations about the approach that will be taken in the book. This review will consider the merits of the book as a text to support learning about educational research, as well as what Springer means by describing his approach to the subject as contextual.

Springer's book is quite a substantial text, and it offers an extensive introduction to key issues relating to educational research. It covers a wide range of topics, and considers both general perspectives and specifics of design, data collection and analysis. It would certainly be a useful book for someone studying the subject with a limited background, as it provides an overview of the range of educational research. That raises the issue of whether it might be suitable as a basic text for a student, given the range of books already available. There is indeed a multitude of books for students on educational research, and these tend to be of two main kinds. Some books are written from a particular standpoint, and intended for those who wish to learn about particular approaches or perspectives: say, ethnographical approaches or approaches especially suitable for practitioner researchers. Such books do not offer a comprehensive account of the entire field (and it seems educational methods is now often considered as a discrete field with its own journals, such as *Educational Researcher*), but often advocate particular ways of doing research that are suitable for particular types of project or contexts. However, other books seek to offer an overview of the field that *is* more comprehensive, and so is relevant to anyone interested in educational research, whatever their topic or project aims. Springer's book fits into this latter class, and in that regard seems to largely cover all the bases.

Now writing such a book is challenging, because educational research is a contentious area, with rather different understandings of the subject matter, and, in particular, different perspectives on the relative merits

of different types of research. To do full justice to the different strands of thought is difficult outside of an edited volume that allows specialists to advocate for different perspectives (such as Bodner & Orgill, 2007), so even where there are well-established and respected books that are judged to offer a strong comprehensive account (e.g., Cohen, Manion, & Morrison, 2011), the educational research teacher may have reservations about indicating that any one book should be considered as 'the' primary text for the subject. This is relevant, because Springer's book seems to have designed very much with that aspiration in mind, seeking adoption as 'the course text'.

The book consists of 17 Chapters, organised into 6 sections. These are: *Introduction*; *Basic concepts*; *Quantitative Research*; *Statistical analysis*; *Qualitative research*; and *Applied research*. The book is set out like a standard US college text, with black text, but with blue used for headings and shading. There are plenty of texts boxes, including regular 'spotlights on research' (about which I will comment later). The book is generally written in an interesting style, and even includes some rather dubious jokes (a table of unit conversions: e.g. a million microphones is one phone, p.122). The book is informative, and entertaining, as well as covering a good deal of material. In my view, then, this would be a useful book for the student of educational research to refer to - although I would hold some reservations about recommending it as a main text. These reservations are linked to the model of educational research presented in the book, and the manner in which the author seems to envisage the book being used by students.

A model of educational research

As suggested above, educational research is a contentious area. It has been touched by the so-called paradigm wars, and many accounts focus on the tensions between different research paradigms (Oancea, 2005). That said, there is little evidence that there really is a 'paradigm war' among educational researchers (Pring, 2000a), even if there does seem to be an irrational bias in certain quarters for a 'gold-standard' of randomised trials (Phillips, 2005). The suggestion is that the US government has an unbalanced view of the kinds of research worth funding through its agencies, and that research that mimics the experimental method is unfairly over-valued compared with other forms of research.

Now, of course, experimental method certainly has its place, and when it is an appropriate approach to a research problem it has great strengths, providing it can be operationalised effectively. However, that is a 'big if', especially for most novice researchers who are unlikely to be working with large numbers of students or in a position to (identify, let alone) control most relevant factors, nor randomize teachers and students to treatments. Moreover, undertaking double-blind trials in education is extremely difficult (as students tend to spot the novelty of the experimental treatment, and often teachers need special training to teach an intervention), and without such procedures there are very significant threats to experimental validity. This seems to be a particular issue in science education where large numbers of student projects and journal submissions seem to report educational innovations where one class or group were offered a novel

and special experience, accompanied by a level of attention and interest (e.g. through data collection) that is atypical of normal classroom contexts; often from a teacher and/or researcher who believes the innovation will have some beneficial outcomes. Often these studies 'demonstrate' the effectiveness of constructivist teaching approaches, peer assessment, problem-solving opportunities or a myriad others things which quite likely *are* indeed bringing about learning gains: however, the absence of any genuinely meaningful controls (that is, what would be considered a control in the physical sciences) leave one wondering whether adopting a treatment that made the students wear all-yellow clothes, or where the teacher inserted the name of a random animal into a random position in each utterance made to the class, or… (the reader may insert their own obscure or fanciful treatment here), would provide statistically significant learning gains. Many of these studies could simply be considered as replicating the widely accepted notions that enthusiastic, well-prepared teachers offering some variety in their teaching, and demonstrating keen interest and confidence in learners, will tend to be more effective in facilitating learning than colleagues lacking these characteristics.

It has been suggested that limited notions of the nature of scientific research inappropriately influences judgements of novice researchers and users of research, regarding the worth of different types of educational research (Phillips, 2005). Yet, *scientific* research is not necessarily identical to *experimental* research: and in many scientific disciplines research is necessarily largely non-experimental. This is recognised by the National Research Council in the US (National Research Council Committee on Scientific Principles for Educational Research, 2002). If we want our research in education to be scientific, then we need to take account of the criteria that make research scientific, and not just mimic experimental science (Taber, 2009). So, ethnographic studies, case studies of individual classes or students, and even action research carried out by practitioners within their own classrooms *can* be considered scientific, and indeed will be more scientific than an 'experimental' study that is poorly controlled and based on an inadequate conceptualisation of a research problem.

In the reviewed text, Springer describes scientific method as having five steps, which, despite being phrased in an inclusive way ('collect and analyse date') include developing and evaluating hypotheses (pp.7-8). Yet, he confuses matters in referring to the "many sources of scientific knowledge" including "tradition and authority, which are useful when factual knowledge has clearly been established" (p.4). Leaving aside questions of the extent to which facts unproblemtatically exist outside of framework theories in which they can have meaning, Springer here seems to confuse personal knowledge with public scientific knowledge: it makes little sense to refer to secondary sources such as texts and teachers among *the sources of scientific knowledge that has already been established* (i.e. originally through research). This is a bit like considering diagnostic blood tests as the source of the illness diagnosed. That said, I thought his treatment of the 'fundamental assumptions, or values' of scientific enquiry was quite sensible when aimed at educational research students who tend to have very varied disciplinary and professional backgrounds. Moreover, Springer rightly stresses the centrality of theory in scientific research, even if his phrasing does not always fully reflect that position.

Given this more inclusive notion of 'scientific' research in education (and other social science areas), then some traditional ways of presenting the paradigm issue in educational research (as a dichotomy of researchers only using and understanding either positivistic or interpretative approaches) becomes problematic. Yet, there are some very real distinctions that students will meet, and any basic text needs to prepare students for dealing with this. The difficulty is that despite all the talk of paradigms, educational research does not divide neatly into a small number of relatively self-contained and inconsistent traditions: rather published studies can be found taking a wide range of approaches, often borrowing liberally from quite distinct traditions, and described by a range of somewhat fuzzy terms. Given this rather messy situation, a teacher, or textbook author needs to offer some kind of teaching model of the ontology of educational research. Such a model will inevitably be a simplification - and should explicitly be presented as such (Taber, 2007a) - but offers students a starting point for thinking about studies, to act as the foundation for developing a more sophisticated map of the field. Commonly such a starting point might relate to the distinction between normative and idiographic studies (Gilbert & Watts, 1983), or, perhaps more accessibly for some students, between exploratory and confirmatory research (Biddle & Anderson, 1986). A very common distinction that is made is between so called 'quantitative' and 'qualitative' research, but these terms are not especially helpful for the novice researchers as they are used in very different, and often misleading, ways in educational research texts.

There certainly are problems with any teaching model of this kind, as (a) the apparent division into two main ways of thinking about educational research inevitably conflates several distinctions which would not divide actual research studies along the same lines; and (b) it ignores claims that there are alternative paradigms which do not fit into either camp – such as so-called 'critical' research perspectives: that is research which is fundamentally committed to changing perceived problems and to some extent prioritises such *action* above acquiring knowledge. Critical approaches are often discussed in the context of social inequalities, but much practitioner action research (e.g. a university science lecturer seeking to make laboratories more 'minds-on'; a school teacher looking to challenge pupils' alternative conceptions about why chemical reactions occur) faces the same questions about priorities. Any teaching model that ignores important complications in a topic has the potential to act as a learning impediment when students meet more advanced treatments. This is an issue often met in school and college science teaching, and it has been argued that this is a strong reason to ensure students are both taught about the nature of models and modeling from early in science education, and have the epistemic status of teaching and scientific models met in the curriculum very clearly highlighted (Taber, 2010). The same considerations need to apply in setting out an ontology of educational research. The lack of such explicit proviso in the present text is unfortunate, but not unusual.

What do we mean by basic research in education?

Springer's model of the field, that is the ontology of educational research he offers readers, starts by making a distinction between 'basic' (or 'pure' or 'fundamental') research and applied research (p.13). This is an interesting starting point in relation to education, as it is often argued that education is by its very nature an applied field that draws on perspectives from other 'foundation' disciplines such as sociology, philosophy, history and psychology. According to Springer, the purpose of basic research "is to acquire concrete knowledge, and ultimately to contribute to theory", whereas "applied research focuses on questions of immediate practical importance" (p.13). Quite what makes knowledge 'concrete' (whilst presumably remaining open to revision, to count as scientific, cf. p11) is a point for readers to reflect on; as is whether the theories that fundamental research contributes to can just be a matter of individual personal theorising (as may be the case in action research projects), or necessarily need to be presented in the public domain. Springer offers examples of fundamental research questions (RQ, labelled here B1-4), but it is not clear why most of these should be considered *educational* RQ (p.13):

- B1: 'how does attention span change during early childhood?'
- B2: 'what is the relationship between gender and self-esteem?'
- B3: 'why do many autistic children have difficulty making eye contact?'
- B4: 'which countries have the most rigorous high school science and maths curricula?'

The first three examples Springer gives are interesting questions, and certainly *of relevance to* education, but are not in my judgement educational RQ. If one of my students, registered for a graduate degree *in education*, wanted to study one of B1-3, I would suggest they needed to find an alternative, educational, focus for their thesis. Springer's final example has better educational credentials, but none of his candidates for fundamental research directly focus on the key phenomena of education – teaching and learning (Pring, 2000b). Springer's suggestions for applied questions seem to be more centrally about educational issues and processes:

- A1: 'How can first-graders' reading comprehension be improved?'
- A2: 'Does a particular intervention programme reduce absenteeism and delinquency?'
- A3: 'When does a particular student give up when solving difficult maths problems?
- A4: 'Do teachers prefer pay rises to be accompanied by additional responsibilities'?'

However, even here, I would not be sure that A4 is really an educational issue, as the question would seem fundamentally the same if 'teachers' were replaced (so to speak) by 'nurses', or 'firemen', or 'social workers': it seems to be a question about something *other than education*, but asked *in the context of* a class of workers in education. I have very roughly plotted these eight RQ on a grid using two dichotomous dimensions, according to the extent to which these questions are about educational processes, and the extent to which they are general issues, rather than highly contextualised (figure 1):

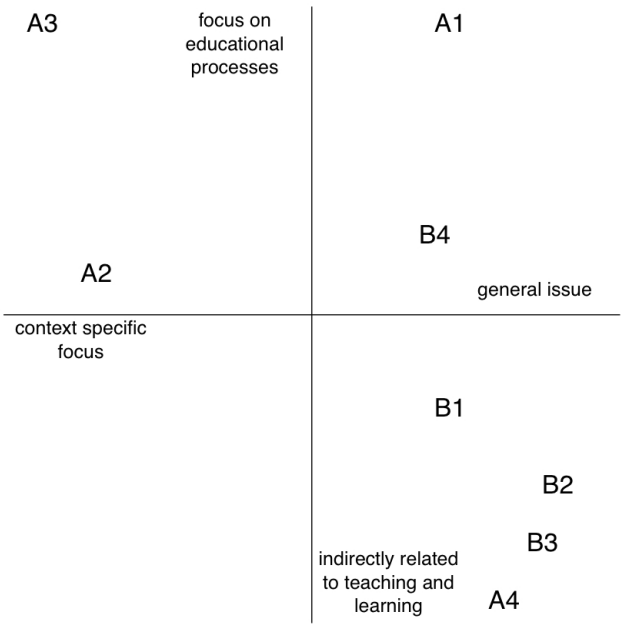

Figure 1: The character of Springer's (2010) examples of basic (B1-4) and applied (A1-4) research questions

The only fairly clear pattern here is that Springer appears to see basic RQ as about general classes of people and events, whereas some (but not all) of his applied RQ are focused on specifics: a specific intervention programme, a specific learner. I would argue that RQ that would be plotted in the lower quadrants are *not* actually educational, and belong to other fields (particularly here psychology: B1-3); and the real issue of relevance raised by those examples I would admit as suitable RQ for *educational* research is the character of research being normative (A1, B4) or idiographic (A2, A3).

Springer here seems to loose sight of what is central in *educational* research. So in Table 1 below I offer a recasting of Springer's 'basic' RQ 1-3, to suggest how these issues might be construed basic or applied in educational research. By considering how knowledge from psychology (in these cases, or sociology, etc) can be drawn upon to make recommendations for teachers, the questions become applied RQ: questions about how knowledge from outside of education can be applied in teaching. If Springer seeks *educational* RQ on these themes which will direct basic research, then that research has to be *about* what happens in real classrooms in the context of teaching and learning.

'Basic' research: exploring what teachers do in the face of particular challenges	**'Applied' research: exploring how ideas from other disciplines can inform teaching**
'what do teachers of early year classes do to take account of changes in attention span change during early childhood?'	'how should teachers of early year classes take account of changes in attention span change during early childhood?'
'how do secondary school teachers go about planning learning activities for under-achieving boys?'	'how can secondary school teachers draw upon knowledge about the relationship between gender and self-esteem when planning learning activities for under-achieving boys?'
'what techniques do teachers of autistic children use to counter their difficulty making eye contact?'	'what techniques can teachers of autistic children use to counter their difficulty making eye contact'

Table 1: Reframing Springer's RQ to shift them into the educational domain

However, it is clear that the 'basic' RQ (i.e. what happens?) in each case here could inform an exploratory study, which could generate ideas to test in the context of the corresponding 'applied' RQ (i.e. what should happen?). The distinction between basic and applied research here remains unconvincing.

Perhaps Springer might have generated more persuasive examples if he had borne in mind two guide questions:

- What is central to education? (i.e. teaching)
- Which concepts and constructs belong to education? (e.g. the teacher, pedagogy, curriculum, lessons, teaching resources, etc – but not attention span, self esteem, autism etc).

From that perspective it could be possible to consider some research in education as 'basic' research, when they explored the nature of actual educational processes.

Yet even if Springer's examples had been valid, I would remain unconvinced this is a helpful way of drawing distinctions. So for example, I know from my own research that often secondary students develop common alternative conceptions about why chemical reactions occur, than they then use as a basis for (mis) understanding key concepts in advanced study (Taber, 1998). I could suggest a sequence of RQ exploring this theme:

- C1: How do different teachers explain chemical reactions at the secondary level?
- C2: How do secondary students interpret different ways teachers explain chemical reactions at secondary level?
- C3: Is there any relationship between the way secondary teachers explain chemical reactions at secondary level, and the way students understand chemical reactions at the end of secondary schooling?
- C4: How should secondary teachers explain chemical reactions in their classes to best support learning of scientifically appropriate conceptions of why chemical reactions occur?

Arguably, this research shifts from being 'basic' research (finding out about aspects of the nature of teaching and learning) to 'applied' research (looking at how basic research can be applied in teaching) at the point where it shifts from being descriptive (C1-3) to prescriptive (C4). Yet this is a rather forced and unhelpful way of thinking about a possible programmatic approach to research into related aspects of an educational problem or issue. So despite Springer suggesting to his readers that this is a primary and major distinction, I think that when we focus on research that is genuinely educational in nature, it is actually not important, and merely acts as a proxy for more useful ways of thinking about research.

Conflating approach and types of data

Springer's next key distinction is between quantitative and qualitative research, which as suggested above, is a problematic distinction. In learning about educational research, just as in learning about science or anything else, the learner will interpret new information and experiences in terms of existing understanding; and when meeting new concepts in educational research, as when meeting new ideas in science, labels can be highly suggestive (Schmidt, 1991). So novices in educational research often tend to think that quantitative research must mean research using quantitative data, and qualitative research must mean research using qualitative data. Such a simplistic, but clearly rational, interpretation also immediately suggests a meaning to another term they will meet – mixed methods research – which is commonly taken to mean nothing more than research using a mixture of qualitative and quantitative data. Unfortunately for the student, this is not how these terms are often intended.

So quantitative research usually means research that uses inferential statistical analytical techniques to test hypotheses and detect 'significant' differences. Other research which uses quantitative *data*, but in purely descriptive ways, would not normally be considered 'quantitative' in the sense of 'quantitative research'. That is reason enough to prefer to avoid the term as a label for a major category in any typology of educational research. However, if we accept this more canonical meaning of quantitative research, and a quantitative-qualitative typology of research, we would expect everything other than research using statistical analyses to be considered qualitative. Yet, just as quantitative research is usually reserved for particular types of research using quantitative data, so the term qualitative research is reserved by many

authors for something much more specific than simply research using qualitative data. Rather, for those who are proponents of qualitative research the term refers to an epistemological assumption that all knowledge about social phenomena necessarily reflects interpretation undertaken from a particular subjective standpoint and is necessarily contextually bound.

From this perspective, the qualitative researcher does not (and cannot) seek objectivity, but rather accepts, reflects upon and attempts to make clear, the necessarily subjective thinking underpinning the analysis and conclusions drawn (Piantanida & Garman, 2009). This is perhaps *in spirit* not so far from the scientific researcher being aware of the theory-ladenness of observations – but whereas the post-positivist turn in philosophy of science has encouraged the US National Research Council's committee to admit broad approaches within scientific methodology in education (National Research Council Committee on Scientific Principles for Educational Research, 2002), some educational researchers eschew any pretence at scientific objectivity in educational research. Probably, deciding which of these two perspectives is the more sensible, actually depends on which educational questions one wishes to explore. All researchers are necessarily contextually bound, and limited and channelled by their available conceptual frameworks, but this is going to be more crucial in some studies than others. In many science education studies, replacing the researcher by another similarly qualified individual will make differences to *the specifics* of data and interpretations (I think for example of the craft involved in eliciting evidence of student thinking in interviews), but qualitative researchers suggest more than this: that the individual researcher becomes so much a part of the process of data collection (i.e. is unavoidably involved in data *generation*) that the broad outline of the findings are intrinsically tied to the individual undertaking the enquiry. When this is taken seriously, qualitative research reports are considered as constructed accounts (new texts built during analysis and reflection, from the texts generated in the field when collecting data) offering for some kind of narrative truth rather than vain attempts at objective reporting.

Now to be fair to Springer, he tells his readers that "quantitative research tends to reflect positivism" (p.19) and that "qualitative studies can be described as more or less phenomenological, a philosophical term indicating a focus of subjective experience" (p.20). Yet, near the beginning of this treatment of the distinction, he suggests that "quantitative research is based on numerical data" (p.14) which - whilst not strictly inaccurate - is misleading (as that is necessary but not sufficient) and so is likely to reinforce students' prior associations for the term. That is, Springer does not make it clear that many studies based on numerical data would *not* be considered as 'quantitative research' in the way the term is often used in education.

Springer also suggests that "qualitative research tends to reflect constructivism, the assumption that realities are constructed by individuals rather than objectively observed" (p.20), which rather ignores the many ways in what the term constructivism is used (Bickhard, 1998; Grandy, 1998). What such discussions often underplay is the distinction between ontology (in terms of the extent to which things exist

independently of human beings) and epistemology (in terms of the extent to which they are perturbed by being probed by humans). The structure of the solar system is unlikely to be changed significantly by the probes of researchers attempting to find out about it; however a learner's understanding of the structure of the solar system *is* quite likely to change under the kind of close questioning required to probe that very knowledge. This is not because the learner's understanding is 'not real' and is only constructed through the social process of the research interview, but because understanding is developed (i.e. changed) through reflection and testing one's knowledge against questioning. We do not have the equivalent of 'non-destructive testing' when probing learners' thinking.

Arguably Springer could have eschewed both his flawed basic-applied categorisation, and the necessarily problematic quantitative-qualitative distinction, and instead focused on the dimension of generality he raised when considering RQ, and paired this with a distinction (e.g., following Biddle & Anderson, 1986) between exploratory research (undertaken when current knowledge does not support clear hypotheses about a situation, and open-ended enquiry is indicated) and confirmatory research (which is more appropriate when we want to test the applicability of a particular idea). This is illustrated in figure 2:

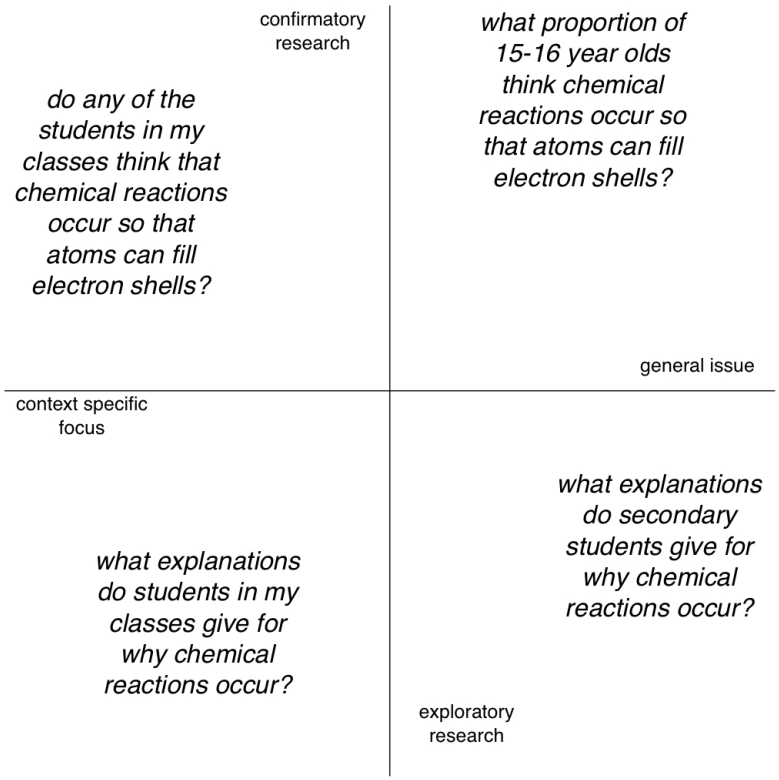

Figure 2: An alternative suggestion for characterising educational research questions and studies

This alternative model gives a clearer view of why there are these different types of studies, and something of how they relate to each other (for example we can ask whether reported findings based on a

national survey will apply in this particular context; or whether results from a specific context can be generalised more widely). The exploratory-confirmatory dimension is arguably much more meaningful and relevant to students than the seductively simple-sounding, but actually quite ambiguous, qualitative-quantitative divide.

Springer supplements the qualitative-quantitative distinction with 'additional types' of educational research, which he classes as mixed-methods research, action research and programme evaluation. Springer is rightly cautious about mixed methods, which arguably is itself usually either (a) a term used for research including a range of types of data, such as case studies, because of the inappropriate adoption (as suggested above) of the terms qualitative and quantities as basic descriptors for forms of research being commonly associated with types of data; or (b) the artificial demarcation of studies. That is, 'studies' that include both exploratory (hypothesis generating) and confirmatory (hypothesis testing) stages may be seen as therefore 'mixed methods' studies, when they could perhaps more sensibly be seen as related but sequential discrete studies within a single research programme.

This can be seen in my hypothetical example of RQ C1-4 above. The first two RQs require an exploratory study that is sensitive to individual differences in teacher behaviour (*C1: How do different teachers explain chemical reactions at the secondary level?*) and student understanding (*C2: How do secondary students interpret different ways teachers explain chemical reactions at secondary level?*). Research to answer these questions would be interpretive, looking to take an inductive approach that seeks patterns in the data (rather than looking to impose predetermined categories upon the data). The next RQ (*C3: Is there any relationship between the way secondary teachers explain chemical reactions at secondary level, and the way students understand chemical reactions at the end of secondary schooling?*) would indicate the need for a correlation study, which would assume there were already suitable categories into which particular cases of teacher behaviour and student understanding could be categorised. This type of study is only possible due to the groundwork of the prior research answering the first two RQ (and then only if those previous studies suggest there are valid general categories that allow data reduction of this type – which itself is something that can only be determined after those idiographic studies have been carried out). This and the final RQ (*C4: How should secondary teachers explain chemical reactions in their classes to best support learning of scientifically appropriate conceptions of why chemical reactions occur?*) would use deductive logic and statistical techniques (but C4 would also draw upon normative ideas about the canonical target knowledge set out in the curriculum to make judgements about quality in educational work, rather than just highlighting patterns).

It would be *possible* to see C1-4 as the basis of a single study, which would be considered 'mixed methods', but there is a serious danger then of assuming in advance that the types of patterns revealed in answering C1 and C2, as these must provide a basis for answering RQ C3 and C4. This might be sensible from a phenomenographic perspective where it is assumed "that people's ways of experiencing or seeing a

phenomena, whilst qualitatively distinct, are limited in number" (Marton & Pang, 2008, p. 535), but many interpretive researchers would feel that taking such an assumption into the field when looking at classroom behaviour and learning outcomes is not justifed. Teaching is a complex process, infleunced by many factors, and RQ C1 and C2 admit the possibility of the need for an idiographic approach (Windelbrand, 1894/1980). In other words, there is a danger in seeing C1-4 as the basis for a single 'mixed method' study because that would constrain the type of findings needed from the first two research quesitons in ways that may prove inappropriate, whereas an exploratory ('qualitative') study to answer C1 and C2 can be designed to be open to different types of findings, which can then be used to indicate *whether* there is the basis for a further confirmatory ('quantativie') study to answers C3 and C4.

Before leaving this theme, another feature of note in Springer's approach is his discussion of measurement. Springer acknowledges that "traditionally, measurement was [sic] defined in terms of quantification, or numerical descriptions of phenomena" (p.123) which, leaving aside the part tense, seems fair enough. However Springer prefers the "more inclusive" approach where measurement is any recording of information, including recording "in some non-numerical format such as a narrative, as in qualitative research". The reader is told that "common approaches to measurement in qualitative studies" include observation, open-ended interviews and archival measures (p.143) where "information is obtained from diaries, letters, blogs, artifacts…photographs, films, and so on" (p.145). All of these 'measures' are "based on nominal, ordinal, interval and/or ratio scales" (p.147). Perhaps my own notions of measurement are too traditional, but I was not convinced anything is gained by looking to include the recording of qualitative data as a kind of measurement, and so seeing texts such as fields notes as a kind of compendium of scale measurements. I suspect this will be confusing to some students.

A contextual approach: beyond applications?

The notion of teaching subjects through a contextual approach will be familiar to most working in science education. Traditionally science courses presented concepts first, and then explained applications later. Such an approach has been widely criticised, especially at school level, as students are expected to learn formal abstract ideas, with minimal motivation in terms of any perceived purpose beyond an examination, and only once they have achieved this are they offered a glimpse of relevance by being shown where those ideas might be useful. Even in schools, some students will thrive on a traditional approach, and - for some well-motivated and able learners - formal, abstract presentations of topics may be an appropriate way of ensuring the students are being sufficiently intellectually challenged (Taber, 2007b). However, for many, and perhaps most, school level students such approaches have been considered to be disengaging, and inadequate for showing the relevance of science to everyday life.

Contextual approaches are problem and applications-led, rather than building up to the introduction of how an idea can be applied. So, in chemistry, for example, rather than organising a course around such topics as structure and bonding, acids and alkalis, extraction of metals, oxidation, etc., topics may be about food,

transport, clothing, pollution etc. The idea is to start form a context that is obviously relevant to the learner, and then to introduce the kind of issues and problems that people face (e.g. having a clear water supply, finding alternatives to fossil fuels, etc), and use these as contexts for introducing key scientific concepts (chemical bonds, combustion, etc).

So we might wonder how a contextual approach to teaching educational research might work. Well here are some suggestions:

Assessment: how can we effectively find out what students know and understand?

Teaching techniques: how could we find out if constructivist teaching/enquiry learning/context-based approaches are more effective at teaching particular groups of students topic X / concept Y / skill Z?

Metacognition: how can we find out if encouraging students to take a metacognitive approach to learning actually improves learning?

Grouping strategies: how can we find out if (or when) students study more effectively organised into 'mixed attainment' groups, rather than organised into similar attainment groups?

Etc.

Clearly we could develop this list, by indentifying key issues in education that an educator or education student would recognise as offering problem contexts that it is important to research, and then develop a course which maps different research deigns, and data collection and analysis techniques, onto these different topics. Each unit would start from an educational problem, and would introduce new educational research concepts, as well as revisiting and developing others met earlier in the course. Developing such a course would be a challenge, and we might ask if learning about educational research (a subject often taught to highly motivated graduates), would actually be much improved by such a context-based course. I approached the book unsure about this, but open to being persuaded by Springer.

Springer, however, does not seem to wish to persuade me. His 'contextual approach' is not anything like my understanding of a contextual approach. Springer introduces the concepts needed to study education research in a traditional 'concept-led' approach. He has chapters with such titles as 'validity and reliability', 'inferential statistics' and 'action research'. This book looks to this reviewer to be no more a contextual approach than most others on the subject.

Springer introduces his notion of a contextual approach by pointing out that

> "the knowledge and skills used by educational researchers are not context-independent [and so] the topics we chose to study, the descriptive frameworks we use, the methods we deploy, and the analyses and interpretations of data we rely on are all informed by historical, political, and social trends" (p.xix).

Indeed. Springer reflects this in his book:

- Through 'spotlight on research' "features that consist of an excerpt from a published article that illustrates chapter content" (p.xx);
- Including discussion of research studies and 'anecdotes' in the text to offer context;
- Suggestions for further reading.

These are all useful (if fairly standard) features, but hardly amount to a 'contextual approach'. Perhaps if each chapter had started with one of the 'spotlights' as a device to launch Springer's discussion, then there might have at least been some attempt for the book to live-up to its subtitle.

Horses for courses

Springer's book, despite some quirks, could be a valuable source of information for many students of educational research. Yet its organisation will probably not appeal to many of the students I teach. The book is organised much like a traditional university textbook, which its discrete sections, and its chapters asking to be made the focus of a sequence of lectures working through the different topics. That's fine if students are studying educational research as an academic subject like physics or history, and expected to take an exam covering the course material at the end. Perhaps some US courses work that way (as the book has several references that seem to assume readers are familiar with the US context, suggesting that is its intended market). However, the research students I work with are only admitted if they have a thesis project in mind, and during their course develop, carry out, and write up their educational research study. The lecture course has to support this progression through the year, and the most helpful general texts are also designed to support students working through that process - from original idea to literature review, to RQ, to research design and so on. I do not think that Springer's book is organised in a way that would help develop a project, rather than just provide information on specific topics. In the context in which I teach, therefore, it is unlikely to be as useful as other texts planned around the logic of a research project. As Springer argues, "the knowledge and skills used by educational researchers are not context-independent" (p.xix), and for our research students the context of their educational research course is an individual project that will support the writing of a thesis. Within that context, ***Educational Research: a contextual approach***, is unlikely to be chosen by many students as their main text.

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