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Who's afraid of research questions? The neglect of research questions in the methods literature and a call for question-led methods teaching

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This paper examines the place of research questions in the teaching of research methods. It describes the neglect of research questions in both methods texts and the wider academic literature, but notes that this situation is not peculiar to educational research and that similar concerns have been raised in the social sciences more widely, as well as in the humanities. It explores some possible explanations for this neglect and argues that the lack of attention paid to research questions may be related to the availability of appropriate resources, the structure and content of methods texts and the way some research is conducted and presented. Question-led methods teaching is presented as both a logical approach to the teaching of research design and data analysis and also a strategy that may help to overcome some of the weaknesses in current practice. It is argued that focusing on research questions can encourage capacity-building among new researchers and may discourage the early formation of 'mono-method' identities.

Keywords: research questions; research design; research methods; teaching

Introduction

> Questions are everywhere; all you have to do is observe and be curious. (Graziano and Raulin 2004, 57)

Curiosity is, or at least *should be*, the driving force behind the conduct of any research (Campbell, Daft, and Hulin 1982; Pole and Lampard 2002). Indeed, the extent to which an activity not motivated by curiosity can be meaningfully characterized as research is limited. Curiosity, however, needs to be appropriately directed and research of any kind is an activity characterized by 'systematic' (Lewins 1992, 8) or 'disciplined' (Graziano and Raulin 2004, 4) curiosity. While essential to any enquiry, curiosity is only the starting point in an investigation.

Research questions represent an attempt to 'tame' curiosity. Pursuing curiosity is most productive when questions are not simply asked in a 'haphazard fashion' (Lewins 1992, 8) but, rather, are posed in relation to what is already known about the topic of interest. The process of formulating, developing and refining research questions allows researchers to make connections with existing theories and previous empirical findings and helps avoid unnecessary repetition of, or overlap with, previous work. This process also allows researchers to clarify their ideas, to reflect on the

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definition and operationalization of important concepts, and to make links between the questions they aim to address and the most appropriate research design.

Given the central role that research questions play in the research process, it is surprising that, until recently, they have received relatively little attention in the methods literature. It is perhaps even more surprising that many reports of empirical research published in academic journals do not specify their research questions or even any explicit aims or objectives. Research questions appear to be a neglected area both in terms of the resources available to students and researchers, and their visibility in certain research outputs. This paper examines the place of research questions in the research methods literature and also some aspects of the current research practice that may work against a 'question-led' research culture. Before presenting a case for question-led approach to the teaching (and conduct) of research methods, the paper starts by examining the neglect of research questions in more detail and suggesting possible explanations for this state of affairs.

The questions explored in this paper are listed below. However, as much of the paper is discursive, rather than resulting from direct empirical research, some of these questions do not take the form recommended for more clearly empirical investigations (see White 2009):

(1) Relative to other topics, how much attention do research questions receive in the social science methods literature?
(2) What are the likely explanations for this degree of coverage?
(3) What are the implications of this degree of coverage for:
    (a) The conduct of research?
    (b) The teaching of research methods?

The current literature on research questions

Relative to the vast literature on other elements of the research process, very little has been written on the subject of research questions. Many well-known and widely read 'general' texts on research methods simply do not broach the subject, or devote only a few paragraphs (or even lines) to the topic. It is very common to find lengthy discussions on the role of questions in interviews or questionnaires – both in general methods texts and monographs or journal articles focusing on this topic – but the role of research questions is addressed much less frequently and usually in less depth. At the time of writing there were only two book-length texts in print that were dedicated to the topic (Andrews 2003; White 2009) both written within the last decade. A third text on the topic will be in print by the time this article is published (Alvesson and Sandberg 2013).

The absence of literature in this area has been noticed by some commentators, who have lamented the lack of attention paid to the subject. As far back as the mid-1970s Lundberg (1976, 6) reported that the contemporary literature on research questions was 'meagre and uneven' and, more than 30 years later, Flick (1998) noted that few textbooks dedicate a separate chapter to the topic or even have related entries in their subject index. This neglect is not universal, however, and some recent texts pay considerable attention to the role of research questions (Robson 1993; Punch 1998; Denscombe 2002; Booth, Columb, and Williams 2003; Maxwell 2005). The situation also appears to be improving over time, with some popular texts increasing their coverage of research questions with each new edition (see, for example, Bryman 2001, 2004, 2008, 2012).

This neglect is not limited to methods texts, however. Unlike other aspects of the research process, research questions appear to have attracted relatively little attention from academics as a subject of inquiry or discussion. The work of Campbell, Daft, and Hulin (1982) and Dillon (1983, 1984, 1990) represent some of the few comprehensive empirical and conceptual treatments of research questions in social science. A lack of attention to this topic, however, may not be confined to the social sciences. Laudan (1977) reported that the methodology of the natural sciences did not, at that time, offer a definitive taxonomy of scientific problem types. Communications with colleagues working in the area of science and technology studies suggest that, more than 30 years later, this is still the case. Philosophers, in contrast, have developed and refined typologies of question types since the time of Aristotle (White 2009).

The relative lack of literature on research questions, however, appears to be in inverse proportion to the need for help and guidance in this area. Most writers who address the subject agree that the formulation of research questions is not only one of the most important elements of the research process but also one of the most difficult, a view expressed by social scientists for more than 50 years (see Merton 1959; Kane 1984; Kerlinger 1986; Black 1993; Mason 1996; Lewis and Munn 1997; Punch 1998; Pole and Lampard 2002; Graziano and Raulin 2004; White 2009) and also by those in the humanities (Fisher 1970), philosophy (Dewey 1938) and the natural sciences (Medawar 1972, 1979).

Problems with question formulation do not appear to be confined to students and novice researchers. Taylor's (2002) interviews with key stakeholders in the social research community revealed concern that professional researchers paid too little attention to the role of research questions in their work, and Bordage (2001) reports that 'insufficient problem formulation' was the second most common reason for the rejection of papers submitted to medical education journals. Few journals in the social sciences require authors to explicitly state their research questions and it is possible to finish reading an article without having a clear idea of the questions the researchers were trying to address. Dillon's (1983, 19) survey of articles published in education journals revealed that only a minority of empirical papers stated their objectives in the form of questions or statements with an 'embedded interrogative structure'. Furthermore, Black (1993) argues that even when research questions are included in research reports, they are often unclear or poorly stated.

This situation does not appear to have changed fundamentally in the time since Bordage's (2001) study. In the most recent six issues of the *British Educational Research Journal* (BERJ) (37:6 to 38:5) only 15 of the 45 articles reporting empirical research included clearly stated research questions or hypotheses. Although the majority of the remainder contained some kind of aims or objectives, there was considerable variation in the detail and presentation, with some articles only expressing a rather vague intention to 'explore' a particular issue. In the six most recent issues of the *American Educational Research Journal* (AERJ), published between October 2011 and August 2012, only 9 of the 34 empirical articles included explicit research questions or hypotheses. As was the case with *BERJ*, some articles provided very little information about the purpose of the reported research.

While the data presented above are only indicative and provide a rather crude snapshot of the reporting of research questions there is no a priori reason to believe that they are in any way unusual. Indeed, as both journals are internationally respected and widely cited – with *BERJ* attaining a Thomson Reuters Social Science Citation Index 2-year impact factor of 1.14 in 2010 and *AERJ* scoring 2.93 in 2011 – it might be expected

that their standards of reviewing would be among the most rigorous. Investigating possible relationships between the reporting of research questions and other aspects of these articles would be interesting but, unfortunately, is beyond the scope of this paper.

Possible explanations

Having established in the previous section that research questions receive relatively little attention in methods texts and also in the wider methods literature and reports of empirical research, this section explores the possible explanations for this situation. First, the possibility that some research is not driven by genuine curiosity is examined. Second, approaches to research that deny the possibility of single answers to particular questions are presented as inimical to the purpose of question-led inquiry. Next, the existence of 'mono-methods' identities and methods-led research is highlighted as a barrier to question-led research. Lastly, the neglect of research questions is linked to another crucial but often an overlooked aspect of the research process: research design.

To what extent is contemporary educational research 'question-led'?

Concerns about the degree to which research is genuinely question-led have previously been raised by several commentators and various explanations for this state of affairs have been proposed. It is important to note that these concerns have not been restricted to educational research or even social science but have also been raised in relation to the natural sciences and other areas of investigation. It has been suggested that barriers to question-led research may originate in researchers' views about the goals of the research, prior assumptions or political allegiances but can also be fostered by particular cultures within research communities. Lewins (1992, 8) argues that the degree to which researchers are curious varies and some investigators can be unduly influenced 'by assumptions which prevent the right questions begin asked'. He suggests that researchers sometimes become wedded to particular explanations or theories and are reluctant to pursue questions that may challenge these cherished ideas. Paradoxically, the culture of research communities does not always foster genuine curiosity. According to Sellitz et al. (1965, 31), 'habits of thought' cultivated within disciplines or groups of researchers can also 'interfere with the discovery of the new and … unexpected'. Both Lewins and Sellitz et al. agree, however, that researchers must be open to the possibility of their research producing unexpected (and even 'undesirable') results, and should also be prepared to treat such findings in the same way as any other research outcomes – critically but fairly. As Medawar (1979, 94) notes, if research 'does not hold out the possibility of causing one to revise one's views, it is hard to see why it should be done at all'.

Partisan research and emancipatory goals

Some researchers, however, do not see discovery or knowledge generation as the only – or even principal – goal of their 'research' activity. Griffiths (1998, 3) advocates 'taking sides' and appears to view 'empowering others; empowering oneself… [and] giving or getting a voice' as at least as – if not more – important that answering questions or generating new knowledge. Similarly, Brown and Jones (2001) focus on 'emancipation' as a goal of research and Troyna and Carrington (1989, 219) have argued that research should be concerned with 'fostering change'. Some of these authors go further, however, claiming that such emancipatory goals require research

to be conducted in a different manner. Griffiths (1998, 3), for example, states that researchers should start with a 'set of values' that not only guide what is researched but also *how* the research is conducted. Gitlin, Siegel, and Boru (1993, 208) ask researchers to 'reconceptualize method so it explicitly embodies the purpose of emancipatory change', Troyna (1995, 397) states that political commitment should 'help to shape and direct all aspects of the research act', and Troyna and Carrington (1989, 201, original emphasis) write that 'both theory *and* practices' of research should be informed by a commitment to social justice. While the quotations above are taken from only a small selection of authors, many similar views can be found in the literature. The expression of such beliefs is not limited to a particular time period or area of study and, writing in the early 2000s, Hammersley (2002) observed that taking this position appears to have become more common.

The important question as far as this paper is concerned is, are these approaches compatible with question-led research? Or perhaps more specifically, are they compatible with curiosity-led research? And should they be taught as legitimate approaches on research methods courses? Advocates of 'partisan' research have argued that their approaches actually lead to better research. However, this claim has been challenged both in terms of the criteria used to judge the quality of research and in relation to the extent to which different goals of research can be balanced simultaneously (see Hammersley 1995).

This is a topic that has been debated widely by the educational research community and it is beyond the scope of this paper to revisit the issues in detail. However, as the extent to which partisan research is compatible with curiosity-led research is directly relevant to the issues being addressed, the most pertinent points will be briefly addressed below. Issues raised by particular authors and studies will be discussed first, before more general arguments are outlined.

One of the most famous debates in this area relates to a study by Foster (1990), who claimed that in a single school that he studied there was no evidence to suggest racist attitudes and behaviour among the teaching staff. Foster's findings were challenged by a number of 'anti-racist' researchers who suggested that he had simply failed to recognize the racism that existed, with one author even claiming Foster's book was 'racist' (Connolly 1992, 145). This led to a nearly decade-long debate that widened to include discussion of the primary goal of research. The criticisms of Foster's finding may have their origins in genuine concerns about the rigor of his methods and perhaps also the presentation of his research. However, the scope of the criticisms went beyond the argument that he had not demonstrated convincingly that racism was not present in this particular school; his critics argued that evidence presented in the book demonstrated that racism unquestionably existed but that he failed to recognize it (see Connolly 1992). This is a very strong claim, particularly when not based on the original data but only on a report of research that these same critics questioned in terms of its rigor. It is interesting to look at these claims in the light of other statements made by 'anti-racist' researchers that raise questions about their openness to particular research findings. Mac an Ghaill (1991, 116), for example, states that he adopts 'a theoretical position that locates racism and sexism as the major barriers to the schooling of black youth' and Troyna and Carrington (1989, 201) have claimed that their approach 'could help obviate the misgivings that many teachers appear to have concerning anti-racist education'. The first statement does not allow for other factors (such as social class, for example) to emerge as more important barriers than racism and sexism, regardless of the evidence produced in a study. Similarly, the second statement precludes the

possibility that 'anti-racist education' may not be the most effective way to combat racism in schools or simply might not work. Taylor Fitz-Gibbon (1996, 21) provides a relevant anecdote in which a prominent researcher on racism was asked what evidence he had that the programme of anti-racist teaching he was advocating was beneficial rather than counterproductive. 'His reply was that he was not that kind of researcher'.

There are examples in the literature of specific cases where the openness of researchers to all research outcomes – and therefore their commitment to genuine curiosity – can be questioned. To be useful, a truly question-led approach to research must also be curiosity-led. However, beyond these particular cases, a more general case against these kind of approaches has been made by Hammersley (1995, 71), who argues that researchers should be primarily concerned with 'the truth of claims, not their political implications or practical consequences'. He argues that those who label themselves 'critical', 'anti-racist' or 'feminist researchers' do not offer a coherent alternative to more convention approaches to research that prioritize the production of knowledge. Additionally, he argues, there is little evidence that more traditional approaches to research have contributed to 'oppression' or that these alternative approaches have been more effective at countering it. Neither is it always the case that individuals or groups can be easily divided into the 'oppressed' and the 'oppressors'. Perhaps the most important concern, however, is that for 'partisan researchers' there is a danger that commitment to political goals ultimately overrides commitment to the production of knowledge (Hammersley 1995; Walford 2001). While it is perfectly legitimate for political commitments to direct researchers towards certain areas of study, every effort should be made to minimize the impact of these commitments on the rest of the research process.

The degree to which 'partisan' research is compatible with a genuinely question-led approach to research is, at best, questionable. However, there have been other developments over the past few decades that have led to approaches to research that may be equally problematic.

Postmodern and post-structuralist approaches

Some commentators, such as Alvesson (2002) and Stronach and Maclure (1997), advocate drawing on the ideas of post-modernism and post-structuralism to inform the practice of research. It seems more popular for educational researchers to identify themselves with post-structuralist ideas but Rosneau (1992) suggests the difference between the two schools of thought is one of emphasis rather than fundamentals. Indeed, although the editorial of a special issue of the *BERJ* (22: 3, June 1996), entitled 'Post-modernism and Post-structuralism in Educational Research', acknowledges that the terms 'drew on a variety of theoretical perspectives' (Paechter and Weiner 1996, 267) and 'cannot be treated as a unified body of theory' (270) it goes on to discuss the terms as if they are, for the most part, interchangeable. The authors note that, at the time of writing, post-structuralist ideas were relatively new in educational research but were gaining popularity among feminist researchers in particular. More than a decade and a half later it is relatively common to see educational researchers claiming to be informed by post-structuralism and, to a lesser extent, post-modernism.

The criticisms of these schools of thought are wide ranging and contingent on the way both '-isms' are defined by their various proponents. However, as Gomm (2004, 1) points out, as these philosophies 'deny the possibility of their being any means for

judging knowledge as being more or less true, they at the same time make research a senseless activity'. Silverman (2007, 139) objects to the rejection of 'every standard that has governed enquiry since the Enlightenment' and Benson and Stangroom (2006, 164) point out that it is fraudulent to define yourself as a researcher if you do not believe in the 'existence or reality of truth'. If there really are 'a multiplicity of truths', as Paechter and Weiner (1996, 269) claim, or no way of judging if one view is more valid than another, then the idea of evidence loses all value. The value of questions is also diminished. Regardless of how well we are actually able to answer a particular question in practice, if there is no correct answer to any question, or no way of deciding between competing answers, the usefulness of questions as tools for research – and the point of research per se – disappears.

It is clear that there are approaches to social and educational research that either subordinate the generation of knowledge to other goals or are sceptical about the existence of an external reality to be researched (Hammersley 2008). Both approaches are relatively common and plenty of examples of such work have been published in prestigious peer-reviewed journals for at least the last two decades. It is also interesting that there is some overlap between these two approaches, with some authors combining post-structuralist and emancipatory approaches to the research process. Neither approach, however, is clearly and unproblematically compatible with the research that takes answering questions seriously. The popularity of such approaches may go some way to explain why research questions have been neglected by some authors. After all, if questions can have multiple answers or if some answers are not considered possible, the point of asking questions in the first place is lost.

It is worth noting that many – but not all – of those advocating 'emancipatory' or 'partisan' research and those proposing the adoption of 'post-structuralist' or 'postmodernist' approaches to research generally define themselves as 'qualitative' researchers. However, as Gorard and Taylor (2004) point out, separating research methods – or even data – into 'qualitative' and 'quantitative' categories is difficult to logically sustain. It is also only one of the many ways in which research practice could be divided and separating research (and researchers) into these or any other categories is neither useful nor desirable. The next section looks at the related issue of 'mono-method' identities and examines whether attachment to particular methods can also impede the conduct of question-led research and the teaching of question-led research methods.

Mono-method identities and 'methodolatry'

Even in cases where researchers are genuinely curious and open to the prospect of surprising results, there may be barriers to truly question-led research. There is evidence to suggest that research is often either methods-led rather than question-led or that the range of questions a researcher can address is restricted by a reluctance to learn new research designs or methods of data collection and analysis. Worryingly, this situation appears to have persisted, with studies in the early 1980s and early 2000s producing similar findings.

Many of the experienced researchers and stakeholders interviewed in Campbell, Daft, and Hulin's (1982) survey expressed the concern that far too much research is led by preferences for certain methods or techniques rather than the desire to answer a particular question. Consensus among the respondents was that the driving force behind most significant 'research milestones' tended to be specific problems to be

addressed rather than the use of particular methods. However, Dillon's (1984) survey, published only two years later, concluded that in the field of educational research inquiry was generally not question-led. Both authors view this situation as problematic, with Dillon (1984) warning that attachment to particular methods restricted the range of questions studied and Campbell, Daft, and Hulin (1982) expressing concern that the repeated use of the same methods led to the creation of research 'ruts'.

Two decades after Campbell, Daft, and Hulin's (1982) and Dillon's (1984) studies, the stakeholders in Taylor's (2002) survey expressed similar anxieties in relation to educational research, with particular concern being focused on 'mono-method' researchers, who repeatedly use a single or narrow range of research methods. The director of a large grant awarding body supported the view that research should start with questions, stating: 'It's a good thing to be problem driven. What did they say about single methodology people – give a child a hammer and everything becomes a nail' (Taylor 2002, 58).

Janesik (1998) uses the term 'methodolatry' to describe the 'slavish devotion to method' that can lead to methods coming before questions in social research. However, the tendency to repeatedly use the same research methods or research designs is not restricted to any particular research 'tradition'. It is common for researchers to define themselves in terms of their preferred methods of data collection or analysis, regardless of their particular area of expertise. While some researchers define themselves as 'ethnographers', 'case-study researchers' or 'conversational analysts', others happily describe themselves as 'analysis of variance (ANOVA) researchers' (see Miles and Shevlin 2000) or 'multi-level modellers'.

The development of mono-method identities is almost certainly encouraged by the common tendency to divide research methods into 'qualitative' and 'quantitative' techniques. Many specialist methods texts use these terms in their titles and general texts tend to be structured around this division. The lack of logical basis for this division has been widely discussed in the methods literature (see Bryman 1988; Gorard 2002a; Gorard and Taylor 2004). There are no methods of data collection that are necessarily or logically connected to the retrieval or creation of either numeric or non-numeric information and, in any case, all data can be traced back to their origin as a non-numerical quality (Berka 1983; Prandy 2002). As Punch (1998, 58) makes clear, data 'does not occur naturally in the form of numbers'. Most current debates surrounding 'combining methods' use this division as the starting point for their discussions (Creswell 2009; Teddlie and Tashakkori 2009). This divide becomes reified and viewed as a problem that prevents the unproblematic use of different methods of collecting and analysing data. Such discussions might be much more useful if they recognized this division as both unnecessary and unhelpful and concentrated on developing productive ways of using diverse data sources and analytical techniques to increase the quality of research.

An additional consequence of this divide is also evident in the existing literature on research questions and, importantly, in methods texts. The formulation of research questions is viewed by some as only necessary in certain types of research. Sarantakos (1998, 119), however, argues that formulating research questions 'is not the prerogative of quantitative research only'. He agrees with Flick (1998) and Agee (2009) that research questions are crucial to the conduct of 'qualitative' research.

This position is perhaps less controversial than the suggestion that hypotheses – used appropriately – can be useful in research of all types. Mason (1996) notes that there is resistance among some 'qualitative' researchers to the idea of hypotheses

and Dillon (1983) observes that most of the attention devoted to hypotheses in the method literature is related to 'quantitative' research. However, some authors of methods texts, such as Dobbert (1982), warn readers that hypotheses are inappropriate for ethnographic research. Creswell (2003) extends this advice to include all 'qualitative' studies which, according to him, do not even need explicitly stated aims or objectives.

In contrast, there are many experienced researchers who believe that hypotheses can be used in 'qualitative' studies and even in ethnographic research. Guba and Lincoln (1994) and Holliday (2002) both argue that hypotheses can be useful in 'qualitative' research. Similarly, Barton and Lazarsfeld (1969), Spradley (1980) and Reason (1994) view hypothesis testing as perfectly compatible with ethnographic studies, and Hammersley and Atkinson (1995, 19) write about the identification and testing of 'hypothetical patterns'. Holliday (2002, 34) provides a very useful review of the arguments for and against the use of hypotheses in 'qualitative' research before concluding that 'the essential nature of hypotheses does not have to be restricted to the controlled world of quantitative research'. Indeed, there is no logical reason why hypotheses cannot be used in any kind of research, as hypotheses and research questions are effectively two sides of the same coin (White 2009). Although formulating hypotheses is not an essential prerequisite to conducting research, there is no reason not to use them where they are helpful.

Students and new researchers should be wary of identifying themselves with particular research traditions, however tempting a certain approach might appear. Forming an identity shaped by a predilection for particular research methods or research designs will tend to limit the kind of questions that a researcher is prepared, or able, to address. Unfortunately, the structure of many research methods texts – and their focus on issues of epistemology and ontology – may encourage this kind of behaviour. However, research methods teaching should actively discourage the development of 'mono-method identities'. Emphasizing a question-led approach to research, rather than presenting students with a number of 'traditions' to choose between, may help avoid students and new researchers adopting these identities early in their research careers.

The neglect of research design

Another area of the research process that has suffered from relative neglect is research design. There are far fewer texts in print focusing on research design than there are on research methods, and even some texts with 'research design' in the title primarily focus on methods of data collection and analysis (e.g. Creswell 2003, 2009). Although the terms 'research methods' and 'research design' are often used interchangeably, there are important differences between the two (White 2009; Gorard 2013). The essence of developing a research design is making decisions about the kinds of evidence required to address your research questions (de Vaus 2001). Research design is not about the *logistics of* research – how the data are collected, for example – but rather about the *logic* of inquiry; the links between questions, data and conclusions (Yin 1989; Hakim 2000).

In addition to being clear about exactly what your research aims to accomplish, having clear and well-defined research questions helps the researcher plan a coherent research design (Denscombe 2002; Stone 2002). This is because a good research question indicates the data needed to answer it (Punch 1998). Once an appropriate research

design has been constructed, the researcher can then decide upon suitable methods of data collection and analysis.

The confusion of research methods and research design has led some commentators to view the latter as something that is only necessary in certain kinds of research. Mason (1996) suggests that 'qualitative' researchers are often resistant to the idea that they need to specify a research design at the beginning of the research process. But as de Vaus (2001, 16) notes, 'any research design can, in principle, use any type of data collection and can use either qualitative or quantitative data'. He emphasizes the primacy of research design over research methods and argues that decisions about sampling and data collection 'are all subsidiary to the matter of "What evidence do I need to collect?"' (9). Flick (1998) supports this view, arguing that both research questions and research designs are crucial to the conduct of 'qualitative' research and Denscombe (2002, 112) reminds readers that 'there are no good grounds for qualitative research to excuse itself from the criteria of good research that apply to other social science approaches'.

The lack of focus on research design described by Gorard (2010, 2013) may be an additional factor contributing to the neglect of research questions, both in the methods literature and in published reports of empirical research. If even some authors of methods texts are unaware of the difference between research methods and research design, it is likely that this misunderstanding is much more widespread among practising researchers who do not consider themselves to be 'methods specialists'. Unless publishers have got their market research very wrong, the relatively small number of texts on research design also suggests that there is little demand for such resources among methods teachers.

A lack of attention to research design is likely to shift focus away from the importance of research questions. An effective research design can only be developed after a clear set of research questions have been formulated. A lack of fit between research questions and research design should be obvious to an informed reader (White 2009; Gorard 2013) and can be identified as a weakness in a research project. Developing a research design from research questions allows a researcher to identify any weaknesses with the research at an early stage and make modifications to eliminate or minimize their impact. It also makes 'warranting' claims – another neglected element of the research process (Gorard 2002b, 2013; White 2009) – a much more straightforward and transparent process. In contrast, flaws in research that does not have a clear set of research questions or an explicitly stated research design are much more difficult to pinpoint. But this lack of clarity also makes claims correspondingly more difficult to warrant and therefore more vulnerable to criticism.

It may be the case that the lack of attention given to research design is connected to the neglect of research questions. It is not possible to attribute any causal direction to this relationship; neither is it necessary, as both are essential to the conduct of quality research. It is clear, however, that – at least in terms of the resources available – both have 'Cinderella' status in the methods literature. Given the lack of relevant data it is not possible to say whether this is actually reflected in the practice of methods teaching. The evidence presented in this paper, however, would suggest that this may well be the case.

Implications for methods teaching

Some of the issues raised above could be seen as criticisms of current research practice pertinent only to professional researchers and academics. While these discussions are

intended to point out aspects of the wider research culture that are problematic, they also raise questions about how methods are currently taught and about the socialization of novice researchers. Students are (or should be) encouraged not only to read methods texts but also to consume research outputs. Those texts and articles can shape their views of what research is, and what it should aspire to be. But many of these texts and articles are written by academics who advocate approaches to research that are incompatible with research that is inspired by curiosity and is open to the possibility of surprising findings. As both of these qualities are essential to question-led research – or even to something that can be meaningfully called research at all – this is a worrying situation.

The benefits gained by spending time formulating and developing research questions have been outlined over the course of this paper and are discussed in detail elsewhere (see White 2009). This process helps clarify the focus of the research, draws attention to any concepts that may need to be defined and operationalized and is an essential prerequisite to the development of an appropriate research design and analytical strategy.

A question-led research strategy is as beneficial to students required to conduct research projects as it is to professional researchers. The teaching of research methods, however, should also reflect this question-led approach. In advocating a truly 'question-led' approach to teaching research methods, I propose the following principles:

(1) Research methods teaching should focus on research questions at the start of a course or module and the importance of curiosity and surprise should be emphasized throughout.
(2) Research design, and its links to research questions, should be taught before strategies for data collection and analysis. It should be emphasized at all times that the research designs should be developed before methods of data collection are considered.
(3) Any philosophical or political positions that are not open to the prospect of all possible research findings – or do not accept the existence of an external reality – should not be presented as legitimate strategies for generating knowledge. They may be presented as interesting historical trends but not as productive approaches to the generation of knowledge.
(4) Philosophical discussions of ontology and epistemology should be kept to a minimum and restricted to issues that impact on research design (e.g. causation, inference, validity, etc.).
(5) Different research 'traditions' should not be presented as pathways to be chosen and adopted as 'identities'. The terms 'qualitative' and 'quantitative' should be avoided unless absolutely necessary and should not be used as a way of dividing up methods of data collection.

Discussion

In the UK and US, concerns about the quality of educational research have been raised, and continue to be raised, both inside and outside of academia (see Oancea 2005). Two themes reappear in these criticisms and the debates that surround them: a lack of quantitative skills and a reluctance to conduct randomized controlled trials (RCTs) or use

other quasi-experimental designs. A concern about a lack of quantitative skills has not been limited to educational research, however, and extends to other social science disciplines (see Gorard, Rushforth, and Taylor 2004; MacInnes 2009; Henson, Hull, and Williams 2010). This issue has been taken seriously within the social science research communities and by funders and policy-makers. Considerable funds have been allocated to tackle this problem and, in the UK, addressing this issue has been a priority for the National Centre for Research Methods. Debates about the use of RCTs have been more prominent in the US (see Slavin 2002) but have also taken place in the UK context. Despite several initiatives to increase their use, very few UK researchers conduct RCTs and there is still considerable opposition to their use among parts of the US educational research community (see Torgerson and Torgerson 2008).

These two debates both relate to the focus of the current paper. Certain research questions, such as those about 'what works', will often be best served by using experimental research designs. This is a decision about research *design*, however, not about how data are collected or how they are analysed. Data produced using these designs may require sophisticated statistical analysis, but may be better served by simple techniques or could be in textual rather than numeric form (Gorard 2013). Other questions may require the analysis of large-scale numeric data sets, perhaps using multivariate statistical techniques. Such analyses can be useful in generating sophisticated descriptions and tracking change over long periods of time. Because of the widespread availability of many very large secondary data sets, such analyses can be conducted with a minimum of resources. Some questions may be most appropriately addressed by the generation and thematic analysis of textual or visual data. However, *all* decisions about design, data collection and analysis should all stem from a consideration of research questions (while acknowledging that practical constraints can intervene).

The current concerns about the lack of use of certain research designs or the inability of researchers to conduct certain kinds of analysis appear to originate from a deeper underlying issue: the reluctance of researchers to take a truly question-led approach to research. Taking this approach means being open to considering new or unfamiliar research designs, methods of data collection and techniques for analysis, and being prepared to undertaking the necessary training that this requires. It suggests, that all researchers become 'lifelong learners' in relation to research methods and that they refuse to define themselves – or be defined – in terms of the methods they currently or have previously used.

The current situation seems to be a long way from this goal. An examination of the current methods literature suggests that creating 'methodological identities' is widely accepted and sometimes actively encouraged. Putting methods before questions, however, is an approach that is inimical to both increasing research capacity among educational and social researchers and improving the quality of research more generally.

It is perhaps too late to change the habits of researchers who are already firmly attached to methodological identities that restrict the range of questions they can meaningfully address. If educational and social research is to progress, however, it is essential that students and novice researchers are taught to take a question-led approach to their research and to be open to learning new methods. In order to achieve this goal, the way research methods is presented and communicated to students needs to be radically re-thought.

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