

Editorial

Welcome to the third issue of *Building Research Capacity*. In this issue we have two articles that address research methodologies often confused with one another. In the first of these Kelly and Lesh (page 1) outline the use of design experiments and raise a number of key themes to consider in their use in education. The other article, by Elliott (page 7), questions what is applied research in education. Elliott's ideas can be pursued further in a forthcoming (see back page for details). Together these articles highlight the key characteristics of these two methodologies and illustrate what is distinct about them.

Two of the other articles in this issue build upon articles from the previous issue. Roberts (page 5) takes forward the limitations of statistical significance testing raised by Gorard (Issue 2) and introduces the use of Bayesian theory to decision-making in educational research. The other article responds to Coffey's (Issue 2) concern over the limited use of innovative qualitative methods in educational research. In this Renold (page 3) presents the use of vignettes in qualitative research, outlining the potential and limitations for their use in educational research.

The final article, by Taylor (page 10) presents some of the findings of the RCBN consultation exercise. This article proceeds to outline how the RCBN will organise its capacity-building activities over the coming year.

Understanding and explicating the design experiment methodology

Emonn Kelly

Richard Lesh

<http://gse.gmu.edu/research/de/>

George Mason University, USA

Purdue University, USA

Educational research is directed at an issue of central societal interest: how to understand and improve teaching and learning systematically. Historically, researchers in education have borrowed techniques from other disciplines in this quest. Some use laboratory methods derived from psychology, others apply ethnographic methods, still others employ survey methods, and so on. In 1992, Ann Brown, a US psychologist, looked to the field of engineering for inspiration on how to conduct experimental research in classrooms. She called her formulation - a hybrid cycle of prototyping, classroom field-testing, and laboratory study - 'design experimentation'. In the past decade, the original notion of the design experiment has been transmuted. Now a diverse set of teaching interventions, educational software design projects, and learning environment manipulations are loosely termed 'design experiments', 'design studies', or 'teaching experiments' (Kelly and Lesh 2000).

We are now conducting an extensive study, funded by the National Science Foundation, to investigate the parameters, capabilities and distinctiveness of design experiments. The goal of the project is to

explicate a design experiment methodology that advances the overall goal of understanding and improving teaching and learning. This task will consume the three years of the grant (and likely will extend beyond it, in practice). The goal is to study the nature of how innovations in the sciences, their computational infrastructure, and their implementations in education should be constructed - so as to be educative to scholars and practitioners.

Working against current tendencies to establish randomised trials as the *sine qua non* of scientific methods is a quiet revolution in design-based research methods. The design experiment/study methodology and its goals, purposes and audiences in educational research are currently under-specified, but the term is applied, typically, when describing the iterative refinement of some innovation (often involving technology) in teaching and learning environments. By whatever label, these emerging methods provide a "working space" in which methodological innovations can grow. It is the goal of this project to provide a positive atmosphere in which we can expand and

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strengthen this emerging methodology, and the timeliness of this work is emphasised by the recent report on Scientific Research in Education (NRC 2002, p.121-123).

The use of the word 'design' allows us a broad canvas for productive thought and conversation. It expands the people from which we can draw for powerful ideas and interventions, including engineers, architects, computer scientists, knowledge managers, experts on diffusion of innovation, philosophers, philosophers of science, anthropologists, cognitive scientists, cognitive neuroscientists, complexity theorists, game theorists, and others. For example, the work on product development at <http://www.ulrich-eppinger.net/> may be of value in this regard. We are also happy to be co-operating with the UK Teaching and Learning Research Programme through its Research Capacity Building Network, and the Programme has so far been represented in its deliberations by four UK researchers – two from RCBN and two from Phase I/II projects.

If we envision educational research as ultimately a service to teachers and students (to improve teaching and learning in the "real world"), then it would appear that design studies may be developed with a range of goals in mind.

- For example, we may ask, how can we design 'design research methods' so that the legitimate needs of those proposing randomised trials can be met and surpassed?
- How can we design 'design research methods' so that the legitimate needs of those on the adoption, diffusion or scaling end can be met?
- For those interested in "what works?" questions, we may ask, "What is the best way to design the *what?* What design standards and benchmarks do you

have in mind for this *what?*"

Some specific challenges for current design studies, include:

How can we retain both the learning about the artefact (broadly conceived) and the learning about learning that the design of the artefact exposes on the part of students, teachers and researchers and designers?

Standardized paper-and-pencil measures are often, politically, the "gold standard" of learning. How to we demonstrate learning on these measures in addition to learning during the innovation? How do we best address "transfer of learning" questions, methodologically?

How can we help researchers measure learning and cognitive change objectively as well as qualitatively (subjectively) while students are actively involved in the design study? How can these measurement techniques "look ahead" to those that might be used in more definitive and large-scale trials?

How can we design studies that have features to allow them to be used later by others, particularly those who will have fewer resources? How can we design for adoption, adaptation, rebuilding, or replication?

How can we design sets of studies on innovation that allow for a more aggregative science across sites, across time, across populations, across content areas? Where and how do we address the sampling issues pertinent to inferential statistical methods?

What tools and methods allow us to better collect, sort and "data-mine" the rich learning of students, teachers, and researchers?

What other data representation tools can we use that will make the rich learning during and after the design experiment available to many audiences?

How can we conduct design studies

that take systemic factors (and systems thinking, generally) into account?

How can we design more effective, multi-tiered studies so that learning at each tier (teacher, student, researcher) is captured and so that the input of each participant is valued?

Design experiments typically unfold somewhat haphazardly with little guiding protocol, and often without the "lab testing" component suggested by Brown (1992). What models of principled design can guide us in making these experiments more systematic and explicit?

Design experiments occur on many time scales (e.g., learning during the experiment on the innovation, related learning during a larger instruction unit, and related learning over longer time scales). How can we monitor and report on each time scale for learning? What implications can we draw for teaching? For future research?

How might we "rescue" the Standards movement from impoverished psychometric models and revitalize it using a design research approach?

There are also some general themes to consider:

- How can we make design studies richer and more powerful?
- How can we make design studies more scientific along the lines of the National Research Council report (<http://www.nap.edu/catalog/10236.html>)?
- How can we make design studies more responsive to practice?
- How can we design studies that prompt innovations in instructional practices, assessment practices, and learning?

As you can see, while we are mak-

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ing progress, there is still a lot of work to be done. Keep your eyes open for a discussion of the role of design experiments in a future issue of AERA's Educational Researcher. If you have any ideas or comments, then the project person-

nel welcome comments and feedback (akelly1@gmu.edu), or you can contact us via the TLRP Research Capacity Building Network (taylorh1@cf.ac.uk).

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Using vignettes in qualitative research

Emma Renold

Cardiff University School of Social Sciences

Vignettes have been used by researchers from a wide range of disciplines, yet very few methodological papers examine the use of the technique, particularly its application within qualitative research. This short article, based upon a longer paper (Barter and Renold 2001), seeks to raise the profile of vignettes and the different ways they can be employed within qualitative investigations.

What are vignettes?

Vignettes are short scenarios or stories in written or pictorial form which participants can comment upon. Whether researching in the 'qualitative' or 'quantitative' tradition, the central feature of this method is to explore participants' subjective belief systems. Finch (1987:105), for example, describes vignettes as "short stories about hypothetical characters in specified circumstances, to whose situations the interviewee is invited to respond". Hughes (1998:381) similarly defines them as "stories about individuals, situations and structures which can make reference to important points in the study of perceptions, beliefs and attitudes".

Vignettes within 'qualitative' and 'quantitative' research

Previous studies have typically employed vignettes within a quantitative approach, usually as a self-contained method or integrated within a large-scale questionnaire. Used in this way, participants are presented with a number of scenarios and their responses elicited using a likert-style format of predetermined categories that follow the vi-

gnettes. For example, Corser and Hurnell (1992) exploring the responses of foster carers, parents and social workers to the desirability of foster care, constructed 6 vignettes from which participants were given 24 statements to either agree or disagree with (see Poulou 2001, for the quantitative use of vignettes in education research). As Finch (1987) has noted, the benefit of vignettes for quantitative researchers lies in their ability to study complex issues with a large number of respondents. However, West (cited in Finch 1987) cautions that general attitudes are often sought at the expense of more peripheral attitudes especially when responses do not correspond to the predetermined classifications. A qualitative application can overcome this, which leaves space for participants to define the situation in their own terms. Here, participants would be asked to respond to a situation by stating what they would do, or how they imagine a third person, usually a character in the story, would react. Sometimes participants are asked to comment upon both. However, as Finch (1987:113) warns, "asking what a third party 'ought' to do in a given situation is not the same thing as asking respondents what they themselves think they ought to do". The relationship between belief and action will be discussed in more detail below.

The use of vignettes within qualitative research can differ in several major ways, including: whether they are employed in isolation or integrated with other research tech-

niques; how the scenario or story is presented (format, length etc.); when they are introduced in the data collection process; and how responses are elicited. While the latter choices will be driven by the aims and objectives of the research and researchers' own methodological and theoretical frameworks, it is possible to distil some of the different ways in which vignettes can be applied and highlight issues that need careful consideration when approaching vignettes from a qualitative standpoint.

Exploring general attitudes and beliefs

Vignettes can be used to elicit cultural norms derived from respondents' attitudes to and beliefs about a specific situation. Finch (1987) describes the merits of tapping into the general imagery of respondents' ethical framework and moral codes, especially when using more than one vignette and/or varying the story with respect to ethnicity, gender and age.

Asking questions

How participants are asked to engage with the presented story or scenario will obviously depend upon the specific aims of the research. As stated earlier, typically participants are asked to respond to a particular situation by stating what they would do, or how they imagine a third person might act. In our own research investigating young people's perceptions and experience of peer violence in residential children's homes (Cawson et al. 2001) we gave young people the opportu-

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nity to comment upon both. Indeed, allowing young people the space and time to freely explore their responses and comments enabled them to have more control over the interview interaction, by enabling them to decide at what stage (if at all) they introduce their own experiences to illuminate their abstract responses.

Context

A non-directional application of vignettes, that is, where space is left for participants to define the situation in their own terms, can be especially productive. Although vignettes need to contain sufficient context for participants to understand what is being depicted, if the scenario is vague enough participants are encouraged to provide additional factors that may influence their judgement decisions.

Multi-method approach

Vignettes have been successfully used in conjunction with other data collection methods (see Hazel 1995; Hughes 1998; Barter and Renold 2001). They can be used to generate data untapped by other methods (e.g. observation or interview). In our research on violence between young people in residential children's homes vignettes were used alongside semi-structured interviews. Young people (and staff) were asked to respond to a range of vignettes depicting different forms of 'violence', regardless of whether or not they had disclosed a similar situation in the interview. This approach enabled a systematic comparison of individual responses to different behaviours.

Some researchers have employed vignettes as an *icebreaker* at the beginning of an interview to facilitate a discussion (Hazel 1995). They can also be used as a warm-up exercise to develop rapport between participants and introduce a particular topic. Other researchers have used vignettes as a way of winding down an interview and broadening the focus from personal experiences to more abstract is-

sues (Rahman 1996).

Sensitive topics

We found vignettes to be especially useful in engaging young people to discuss potentially sensitive topics in a number of ways. For example, it was easier for those who did not want to discuss personal experiences to respond to other people's experiences. This was particularly true of some of the boys in our research who found discussing their personal experiences uncomfortable. Indeed, disrupting the sometimes overwhelming intimacy and intrusiveness of the face-to-face interview by focusing on reading the vignette, seemed to create a comfortable distance between the researcher and participant and went some way to facilitate a non-threatening environment.

Authenticity

Poulou (2001:52) states that the only common feature that vignettes have is that "they describe a fictitious situation". However, as many researchers using vignettes have stated, they are most productive when the scenarios depicted appear real and conceivable to participants. In our own research, our vignettes were based upon 'real' situations that other young people had disclosed to us (from previous research). When young people realised that the anonymised stories had actually happened, they seemed especially keen to participate in the research. Deriving the vignettes from 'real' experiences also seemed to encourage some young people to speak out about more abusive forms of violence, with the knowledge that it had happened to others.

Compensating for lack of personal experience

Vignettes can be employed to tap attitudes regardless of whether participants have had any direct experience of a situation. Having no prior knowledge of young people's experience of violence, vignettes became an invaluable component of our methodology because they provided a focus for those who had no personal experience of violence

(or particular forms of violence).

Comparing disparate groups

The application of vignettes offers the opportunity to compare and contrast different groups' (e.g. staff and pupils, pupils from contrasting schools) interpretations of a 'uniform' situation, while at the same time enabling certain cultural factors such as age, gender and ethnicity to be isolated and identified. This was especially important in our understanding of the wider context in which different types of violence were perpetrated or experienced and permitted a more systematic development of benchmarks for understanding differences in interpretation.

Limitations and challenges

The most commonly reported theoretical and methodological limitation to using vignettes is the relationship between the vignette and 'social reality' - between belief (what they say they 'ought' to do) and action (what they 'actually' do). Some researchers caution against using this technique as a stand-alone method, because of the indeterminate relationship between vignettes and social life (Faia 1979). Indeed, there are researchers who argue that vignettes mirror social reality and others who conclude the opposite or suggest that it is far from straightforward to draw parallels between the two. Following Finch (1987), we believe that it is not the outcome (or action) that is of research interest, but the process of meanings and interpretations used in reaching the outcome that is of central concern to social scientists. Vignettes can thus provide a useful tool to illuminate and tap into these complex processes by isolating certain aspects of a given social issue or problem. When integrated within a multi-method approach (such as observation and interview) our understanding of these processes and the relationship between belief and action can be enhanced.

Summary

This article has aimed to introduce and illustrate the different ways in
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which vignettes can be employed in qualitative research. While deployment of this technique will ultimately depend upon the aims and objectives of each research project, our own usage as part of an integrated approach suggests that, if used flexibly, vignettes can be particularly productive in a number of ways. They can: engage young people to discuss potentially sensitive research topics; enable an exploration of issues or incidents that participants may have no direct experience of; and systematically compare and contrast disparate groups' interpretations and belief systems. In sum, vignettes can be a productive part of a researcher's methodological tool-kit and have the potential to explore meanings and interpretations not easily ac-

cessible through other methods.

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Belief and subjectivity in research: an introduction to Bayesian theory

Karen Roberts

Cardiff University School of Social Sciences

In a previous issue of this journal, Gorard (2002) highlighted the commonly ignored limitations of statistical significance testing. These limitations, he suggests, should cause us to challenge the automatic and uncomplicated use of traditional statistical significance testing that is so common in social science research. They should also lead us to consider possible alternatives. One such alternative is the use of Bayesian models. These models represent not only an alternative to more traditional approaches to statistical hypothesis testing, they also offer the possibility of according an explicit place to the role of prior knowledge or prior information, belief, and subjectivity within a quantitative approach to decision-making in research. The role of this article, therefore, is to provide the interested reader with a very brief introduction to the theory underlying Bayesian approaches to decision-making in research.

Bayesian theory has grown from a

single theorem that outlines a formal procedure for merging knowledge obtained from experience, or theoretical understanding, with observational or other data - i.e. for learning from experience or conducting research. The Reverend Thomas Bayes (circa 1702 – 1761) proposed what was to become known as Bayes' theorem. This theorem contains several premises, one of which is that any attempt to draw conclusions from a given body of research or other evidence involves a rational decision-making process. In other words, the conclusions we draw from our research evidence represent decisions *about* the evidence, and these decisions should be arrived at in a coherent fashion. In "real-life" terms, this implies making decisions about our current state of knowledge in the light of both past experience and current evidence.

As with more traditional statistical approaches to decision-making, Bayesian theory rests on the prem-

ise that decisions about research evidence can be represented or operationalised in terms of probabilities. However, unlike more traditional approaches, these probabilities are not based solely on the current evidence that has been collected. It seems both unrealistic and wasteful not to include in our decisions about research evidence the results of our literature review, our past experience, our previous research, expert opinion, the context within which our current evidence is gathered, and any other sources of information external to the evidence we are currently faced with. These sources of information have helped us to focus our research questions or our theoretical area of exploration. They may have shaped our conceptualisation of the issues we are interested in exploring, or they may have guided our choice of the variables to include in our study. They may then colour our interpretation of the findings from our current research. This experience, the

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theorem suggests, forms part of our decision-making process, and it is therefore formally included in the process of generating the probabilities that represent our research findings. Thus, the theorem states that research results are generated by beginning with what is already known (prior information), adding new evidence or information that might be available to this (the results of our current or new research), and making a decision about what is now known (posterior information). This can be represented as:

Prior information + New research
= Posterior research conclusions

Bayesian approaches outline the procedure for updating our existing knowledge in the light of new evidence so that we do not make decisions (generate probabilities) about the results of a particular body of evidence in isolation.

Bayes' theorem rests on the premise that the decisions we draw from research evidence and the probabilities that represent them are not objective truths, but rather represent our beliefs about the nature of the evidence. Probabilities are not conceived as objective and mathematical, but as a representation or operationalisation of subjective beliefs about events or phenomena. Within Bayesian analysis, therefore, prior information is represented in terms of a probability (or probability distribution) that encapsulates a decision-maker's subjective beliefs about what is known prior to undertaking or considering the results of a new piece of research. New research is combined with this probability in the form of a likelihood. This yields a posterior probability (or posterior probability distribution) that represents an individual's beliefs about the weight of evidence in relation to a particular hypothesis that the research set out to test. Therefore, in its simplest and most general form, Bayes' theorem states that the prior probability, multiplied by the likelihood, is propor-

tional to the posterior probability.

This stance on the nature of probability plays a large part in making the Bayesian approach an important, viable and controversial alternative to more traditional statistical approaches to hypothesis testing and decision-making in research. One may ask, then, why its use is not more widespread in social science research. Bayesian approaches have been largely ignored until recently, partly because the role accorded to belief and subjectivity in statistical decision-making has been controversial, but also because it is only with recent advances in computational capabilities that it has been possible to carry out full Bayesian analyses. These advances have meant that Bayesian approaches are enjoying increasing popularity, particularly in the field of meta-analysis where the Bayesian approach to the accumulation of research findings has been welcomed. Its perspective on the nature of probability has also facilitated the inclusion of sources of evidence not routinely included in meta-analyses, such as observational data and qualitative evidence. In the first example of the inclusion of qualitative evidence in meta-analysis, individual decision-makers were asked to list the factors they believed to be important determinants of uptake of childhood immunisation, on the basis of the results of qualitative studies of uptake (Roberts, Dixon-Woods, Abrams, Fitzpatrick & Jones, forthcoming). The results of quantitative studies of various types were then added to this to generate posterior probabilities that particular factors were important in predicting uptake of childhood immunisation. As an example of this, on the basis of their own beliefs and the results of qualitative evidence, individual decision-makers felt that what parents believed about immunisation was the most important factor in determining whether they would take up immunisation for their children. They were able to state their degree of certainty about this in terms of a prior probability, $p = 0.177$. Once the quantitative data was added to

this, a child's health status became the most important factor in predicting whether the child would be immunised. The posterior probability with which this belief was held was $p = 0.355$.

One of the significant consequences of both using prior information and treating probabilities as subjective within statistical decision-making, is that it is entirely possible for two decision-makers to reach different conclusions (hold different posterior beliefs) on the basis of the same body of evidence. This is particularly likely if the decision-makers hold substantially divergent prior beliefs; if, for example, they believe different factors to be important in determining uptake of immunisation. In fact, divergent prior beliefs *should* lead to different posterior beliefs, unless the weight of new evidence is so convincing that it overwhelms the decision-makers' initial perspectives. A further consequence of incorporating prior information into Bayesian decision-making, is that different decision-makers may reach the same conclusion but with different levels of expressed uncertainty. In other words, some decision-makers may be more sure about a particular decision (how likely it is that the child's health status determines uptake of immunisation) than others and this level of certainty can be acknowledged in the model. The use of posterior probabilities generally creates meaning for such statements as "I'm 35.5% sure that a child's health does determine uptake of immunisation", and it overcomes the adoption of arbitrary cut off points for the rejection of null hypotheses that the use of traditional significance testing necessitates.

Different posterior beliefs may also result where a number of decision-makers hold different beliefs about the value of particular decisions or the value of different sources of evidence that may contribute new information. Prior beliefs may be updated in the light of new information in a way that maximises desired outcomes, or maximises utility.

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Similarly, they may also be updated in a way that minimises the loss associated with particular outcomes or particular decisions (such as to reject a null hypothesis where the consequences of doing so incorrectly are potentially harmful). Different sources of information may also be weighted differently, so that prior beliefs are influenced more substantially by information that is considered to be credible and are influenced less by information that is not as highly valued or is considered to be less reliable. It seems important that any formal decision-making process makes explicit the role of utility preferences, the val-

ues assigned to different sources of evidence used in decision-making, and includes prior information, as the Bayesian approach does.

This very brief introduction to Bayesian theory has, of necessity, glossed the relevant concepts and debates about its use. The reader who seeks a fuller treatment of these issues is referred to the suggested further reading list.

References and suggested further reading

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What is applied research in education?

John Elliott

University of East Anglia

More Questions

In reflecting about this broad question it may be helpful to break it down into a number of sub-questions. I find myself asking the following:

1. What is it about the activity of research that is being applied within the field of education?

- Is it a particular group of research methods?
- Is it a type of knowledge associated with a particular group of methods?
- Is it the intention to link research with action in a form that generates actionable knowledge? (See Hargreaves, 1997)
- Does the intention to generate actionable knowledge in the field of education necessarily imply a particular group of research methods or a type of knowledge that may be associated with such methods?
- Which features of the processes of designing, carrying out and validating research are indicative of the intention to generate actionable knowledge?

2. What theories about the link between research and action in education under-pin different answers

to the question 'what is applied research?'

- To what extent are such theories spelt out as a basis for justifying the 'applied' character of particular pieces of research, as opposed to remaining implicit in their design?
- To what extent are such theories empirically testable?
- Are not different theories about the link between research and action so rooted in different educational ideologies (e.g. 'liberal', 'vocational', 'civic' conceptions of the aims of education) that it becomes impossible to settle which works best on the basis of empirical evidence alone?

3. What criteria might one employ to evaluate the success of a piece of applied research?

A Post-Paradigmatic Perspective on Applied Research.

My own response to the question 'what is applied research in education?' follows. It does not address all of the sub-questions in detail and certainly not in the order listed. However, most are touched on.

Applied research in education is best characterised by the intention

to link research with action in a form that generates actionable knowledge. This intention is evidenced in the processes of designing, carrying out, and validating the research findings. It need not necessarily imply a preference for a particular type of knowledge or the methodology associated with its production. There are no characteristics inherent in some research paradigms that render their knowledge outcomes more actionable than in others. In this respect my answer to the question of 'what is applied research?' is post-paradigmatic. It is educational practitioners or policy-makers who ultimately determine the extent to which knowledge outcomes are actionable within their particular action contexts.

From my post-paradigmatic perspective on applied research the intention to link research with action in a form that yields actionable knowledge will be evidenced by involving educational practitioners and/or policy-makers in the processes of designing and carrying out the research and in validating its findings. The level of this involvement may range from practitioners and/or policy makers being con-

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sulted at each stage of the research to them taking the primary responsibility for the process at each stage, perhaps with the help of an external research consultant. With the exception of entirely practitioner-based applied research most post-paradigmatic applied research will involve a collaborative relationship between educational practitioners and/or policy-makers and professional researchers. Methodology in this context will not only be concerned with procedures for internally validating knowledge in terms of the canons inherent in any chosen paradigm of knowledge production. It will also be concerned with developing procedures to govern the roles and relationships between the collaborating partners in order to maximise the possibility of high yields in actionable knowledge. It is these procedures which centrally characterise what is meant by 'methodology' in the context of post-paradigmatic applied research.

Normally 'methodology' consists of an account of the methods and procedures employed within a particular paradigm of knowledge production to secure the internal validity and reliability of its findings. Questions about how to control against bias, sample from the target population, analyse and interpret data, and ensure the validity, reliability and generalisability of research findings, tend to be disassociated from questions about the use of findings to inform policy and/or practice. The latter are assumed to belong to a quite separate set of considerations concerning the dissemination of findings and their practical application. Even when the methodology is shaped by the intention to produce useful practical knowledge, as school and teacher effectiveness research is, the context of use is not something it is expected to address directly as a specifically methodological concern.

The production of valid and reliable findings, according to methodological canons that are internal to a particular paradigm of knowledge

production, is not sufficient to guarantee their relevance and usefulness in particular contexts of action. They do not necessarily constitute evidence that can be used to inform judgement. There is a tendency to view methodology from the standpoint of a theory of knowledge production.

Post-paradigmatic applied researchers in education approach questions of methodology from what would commonly be regarded as the 'back-end' of the research process as opposed to the 'front-end'; from a consideration of the context of use. For example, with respect to probabilistic generalisations, Cronbach (1975), an internationally renowned psycho-statistical researcher, observed that although research "may reach an actuarial generalisation of some power, this will rarely be a basis for direct control of any single operation." He had begun to look at research from the 'back-end', which shifted his perspective on the validity of statistical generalisations, for he went on to argue that "any generalisation is a working hypothesis, not a conclusion." In a later book (1983) he argued that too much attention had been given to questions surrounding the internal validity of research findings, which focuses on their generalisability from the sample they are based on to the target population as a whole. Cronbach claimed that not enough attention had been given to demonstrating the external validity of findings to the potential users of the research, by extrapolating their implications for policy and/or practice in particular action contexts.

The most influential work on the development of methodologies for applied research in education from the 'back-end' in the UK was by Lawrence Stenhouse (see 1975; also Rudduck and Hopkins, 1985). Stenhouse (1979) argued that in order to use research findings teachers needed to do research. He attempted to demonstrate that in order to use the results of an experimental trial into the effectiveness of different teaching styles, a teacher

would have to assess their applicability by undertaking a systematic study of his or her own classroom. Building on Cronbach he argued that "what the classic research procedure offers to teachers is not conclusions to accept but hypotheses that need testing" (Rudduck and Hopkins, 1985:49). One of the problems with this kind of research, for Stenhouse, was that it made little contribution to educational theory building for teachers, pushing the responsibility for interpreting the multivariate complexes of factors operating in their action context solely onto them. A central role of educational research, according to Stenhouse, was to develop an educational theory about the relationship between teaching, learning and knowledge "which can be tested by teachers in classrooms" (Rudduck and Hopkins, 1985:29). Research therefore informs action by generating action research, which he defined as "the adoption of action as a systematic mode of inquiry". Looking at educational research from the 'back-end' he developed a theory of external validity which depended on the generation of action research by teachers and on the development of a genuine form of collaborative research between external researchers and teachers.

Again, looking at research from the 'back-end', Stenhouse believed there was a need to supplement experimental studies in the classical sense with "observational and descriptive: studies styles of research which tutor judgement by extending experience" (Rudduck and Hopkins, 1985:50). Stenhouse identified two traditions of case study research that he felt teachers might usefully engage with to inform their actions as a systematic mode of inquiry (Rudduck and Hopkins, 1985:52-55). These were the ethnographic and the historical. The former tends to call the cultures they focus on into question rather than building on their taken-for-grantedness while the latter assumes shared understandings of the culture with the reader and deals with the

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“foreground of action.” The function of such case studies is to enable a teacher “to weigh up his/her own situation by comparing and contrasting it with accounts of other situations”. In placing his/her situation in a comparative context the teacher, Stenhouse argues, generalises from and across cases retrospectively as they are compared and contrasted. In doing so the teacher not only extends and enhances their judgement in relation to a particular practical context but assesses the external validity of cases and the retrospective generalisations that have previously been formulated about them.

For Stenhouse no paradigm of knowledge production in itself is specially privileged as a vehicle of actionable knowledge. In this respect his vision of applied research was truly post-paradigmatic. Only the teacher could create actionable knowledge through the adoption of action in their classrooms as a systematic mode of inquiry. It was teacher-based ‘action research’ in classrooms and schools that linked the processes of knowledge production with knowledge utilisation. Hence specifying procedures for engaging teachers in systematically testing the implications of research findings was an important component of applied research design. Action research is central in Stenhouse’s theory about the link between knowledge and action.

Kennedy’s (1999) empirical study of the relevance and use of educational research conducted in different genres both supports and negates Stenhouse’s theory of actionable knowledge. She found that what makes evidence credible or plausible to teachers is that it helps them to make sense of the complex triangular relationship between teaching, learning, and subject matter in their classrooms. Different genres of research – experiments, surveys, case studies and narratives – can be of equal value if they help teachers deepen their understanding of the complexity of this

relationship. If they fail to address this concern, teachers find little value in them, regardless of genre. The studies which teachers found to be of little value “each addressed only one or another corner of the triangle connecting teachers, subject matter, and learners.” For example, teachers did not judge student performance data to be particularly useful. They found it difficult to interpret “without more knowledge of what these students’ teachers were doing.” All of this supports Stenhouse’s view of the action context of teaching.

However, Kennedy’s research did not support Stenhouse’s contention that in order to use research findings teachers needed to test them through systematic inquiry in their own classrooms. She found that teachers could create actionable knowledge from research findings by more intuitive means. They were able to forge analogies between reports of research findings and their own action contexts. Here practitioner judgement, drawing on prior experience in similar action contexts to those addressed by the research, again appears to be central to the link between knowledge and action. The difference between Stenhouse’s view of the nature of the judgements linking knowledge to action and Kennedy’s is that, while for the former judgement is based on systematically gathered evidence, for the latter it is based on intuition informed by past experience.

One explanation for the emphasis Stenhouse places on ‘action research’ as a mediating link between knowledge and action is his concern with educational change issues and with applied research as an instrument for accomplishing radical transformations in the triangular relationship between the curriculum, teaching and learning in the action contexts of classrooms. In the light of this concern one can understand why intuition informed by past experience is insufficient as a sole basis for judgement. In a context of radical educational transformation engaging teachers in sys-

tematic inquiry, as a means of testing the validity of research findings, may well be a condition of applied research fulfilling its intention to generate actionable knowledge.

Whichever view one subscribes to, about the nature of practitioner judgement in the external validation process, both provide prima facie reasons for involving users in the processes of research generally, and not only at the ‘back-end’ during the ‘validation of findings’ stage. Engaging users in defining the research questions, in selecting the appropriate methods of inquiry, in the gathering and analysis of the data, and then in testing the implications of findings in their particular contexts of action, are obvious ways of strengthening the links between knowledge and action and thereby improving the utility of research findings.

Questions about the procedures for securing the external validity of research findings are, from a post-paradigmatic applied research perspective, unambiguously methodological. They are about creating the optimal conditions for generating actionable knowledge.

A post-paradigmatic applied research methodology then will centrally consist of an account of how the activities of research – of planning, carrying it out and interpreting its findings – will be organised to generate actionable knowledge for practitioners and policy-makers operating in particular action contexts. Such an account will take the form of a ‘code of practice’ specifying roles and relationships within a form of inquiry that links the processes of knowledge production and utilisation.

Some advocates of practitioner research have tended to the view that only research carried out exclusively by ‘insiders’ can count as valid knowledge. This was not Stenhouse’s view. There is a big difference between such a view and one that sees practitioner research as a means of testing the validity of find-

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ings, from whatever source. When it is viewed as the only source of knowledge, it is reduced to one more paradigm in competition with others for 'authentic knowledge' status. Unfortunately the term 'action research' is often used to signify this paradigm. However, from a post-paradigmatic perspective 'action research' is best interpreted more generally as a form of applied research aimed at generating actionable knowledge in an educational change context. Such research will be open to using a variety and range of research methods and genres, including case studies designed to test the action implications of findings in classrooms and schools. It will tend to be a collaborative process, involving not only teachers in a discourse with professional researchers but other change agents and stakeholders also. (E.g. educational administrators, advisors and even school students.) This is not to deny the value of individual teachers carrying out small-scale

investigations in their classrooms. It is merely to acknowledge that when they are carried out in isolation from a wider programme of applied research they are operating in sub-optimal conditions. As sources of actionable knowledge such investigations may be as methodologically restricted as research carried out exclusively by 'outsiders'.

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John Elliott will be speaking at the forthcoming 'Action Research Conference: Principles, Challenges and Future Directions' conference on the 1st November 2002 in Cardiff. This is being jointly organised by the TLRP Research Capacity Building Network and the Cardiff University School of Social Sciences.

For further details about this and all other RCBN activities please visit our website:

www.cardiff.ac.uk/socsci/capacity

Report on the RCBN Consultation Exercise

Chris Taylor

Cardiff University School of Social Sciences

The RCBN provides *needs-directed* research capacity-building activities on a voluntary and career-development basis. Consequently we have undertaken an extensive consultation exercise in order to gauge the needs of the ESRC Teaching and Learning Research Programme, the educational research community more widely, and individual researchers. The results of this consultation exercise have helped us prioritise our research capacity-building activities. For example, the consultation exercise has shown that there already exists a significant level of expertise amongst educational researchers in designing literature reviews and case studies, and using semi-structured interviews and one-to-one interviews to collect data. Educational research is also successful at involving the 'user' community in the research process. However, the

consultation exercise has shown quite clearly that many educational researchers still feel a need to develop their research skills, knowledge and approaches.

Our consultation exercise has involved four main elements. When the RCBN was created we held a series of meetings around the UK to meet and discuss the role of the RCBN with current TLRP projects. The second element of the consultation exercise was to interview key stakeholders from across the education field. These included policy-makers, practitioners, funding agencies and researchers, both from within and outside the TLRP. They were asked for their views on the current state of educational research, to identify the constraints in developing educational research, and how educational research could be further enhanced. The

third element has been to survey, as widely as possible, the UK educational research community in order to identify the current expertise in research, and individual researchers' future training needs. With over 500 responses this part of the exercise has helped us to establish a database of research expertise from which we can draw to help facilitate the sharing of research skills and knowledge across the UK educational research community. We have also been able to use the results from this survey to ascertain both the needs of individual researchers and, where applicable, the level of training or assistance we need to provide. The fourth element of our consultation exercise involves on-going discussion with individual researchers and TLRP research projects with regard to their continued professional de-

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velopment.

Future RCBN Activities

Although on-going we have now completed the major part of our consultation exercise. We continue to welcome individual requests for help, but to ensure that our activities meet the needs of the community as a whole as well as the needs of individual researchers, and to ensure that we achieve a balance of activities, we are in the process of developing a programme of activities. Using the results of the consultation exercise we have been begun to outline our priorities for the short- and medium-term in agreement with the TLRP Steering Committee. For example, we have begun to distinguish between career development needs and methodological needs. It is clear from our consultation that there is a need to help educational researchers develop their research careers. Although not totally distinct from methodological needs, career development needs are those that will help build one's career as an educational researcher. Our activities are likely to distinguish between new researchers, mid-career researchers and well established researchers. Of course the needs of these three groups are not mutually exclusive but they convey the breadth of our activities.

Methodological needs differ somewhat in that they are determined by the levels of expertise that researchers currently have rather than their stage of career. Our consultation exercise has helped identify the required levels of training or learning. The consultation exercise has also made us differentiate between the needs of the 'users' and 'consumers' of educational research methods. On the one hand the most active *users* of particular methods or methodologies tend to be researchers, and have particular concerns in refining their applied methodological expertise. On the other hand, *consumers* of educational research may be practitioners, policy-makers or researchers and their primary needs concern

the interpretation, understanding and evaluation of different methodological techniques.

So what kind of capacity-building activities could you expect to see emerge from the RCBN that meet the methodological needs of the educational research community?

The specifications of this research capacity building exercise and our own consultation exercise request that we pay particular attention to quantitative research methods and related methodologies. The results of our survey illustrate how relatively few educational researchers there are with such quantitative skills. However, the survey also shows that, because of this, many respondents want capacity-building activities that, perhaps in the first instance, help them to interpret and 'consume' quantitative research or show them how such methods can be applied in educational research. These range, for example, from the basic use of numbers to multi-level modelling, log-linear analysis and time-series analysis.

The consultation exercise has also revealed a perceived need to improve the quality of data, both quantitative and qualitative, that educational researchers use. This includes the use of secondary data - such as the use of the ESRC Data Archives, UK large-scale datasets, and international datasets generally - and new methods for collecting data - such as using video technology and conducting interviews over the internet.

In terms of analysing data the consultation exercise has highlighted the need to develop skills and knowledge in the interpretation of numerical data, particularly from large-scale data sources. This is associated with a need to learn how to use quantitative data analysis software. Similarly there is demand to learn about the use of technology in the analysis of more qualitative data, such as from video footage, discourse analysis and conversational analysis.

A final area of concern that the con-

sultation exercise highlighted is how to improve the impact of research on policy and practice. Here our consultation has also shown that there is relatively limited expertise or understanding of this process. Consequently, the RCBN aims to develop, with the help of other TLRP colleagues, a greater understanding of the relationships between research, policy and practice in order to start identifying the kind and form of activities or events that may be needed to improve the use of educational research.

What Next?

The RCBN has been established primarily to support researchers within the TLRP. However, all the services and capacity-building activities that the RCBN offer are available to all educational researchers. We strongly encourage all researchers, potential researchers, and users of research to visit our website. You can obtain advice on how to develop your own capacity building strategy or professional development plan. Plus you will get access to useful research resources, forthcoming non-RCBN events, methodological references and all our own capacity-building activities. These include conferences, seminars, training workshops, on-line guides, buddy systems and other ways we hope will help to develop research expertise in educational research.

We always welcome your input, advice, comments and suggestions for capacity building activities. In particular, we are interested to hear from researchers who wish to be involved in the Network, either by offering their expertise or requiring assistance.

Look out for more details about future RCBN activities in forthcoming editions of this journal or from our website:

www.cardiff.ac.uk/socsi/capacity

*A longer version of this article should appear in BERA's Research Intelligence, No. 80.

RCBN News

New look to the RCBN website

We have re-designed the RCBN website to accommodate a number of new features and to make it easier to navigate and use. There is now a section to help educational researchers identify their capacity-building needs. There is also a search facility to help you find the resources you may need. For other additions visit our "What's New" page.

NVivo workshops

The RCBN have now held two successful workshops on the use of NVivo (qualitative data analysis software) in Newcastle and Cardiff. Evaluations of these workshops will appear soon on our website. If researchers would like further information on these workshops or would like further help in the use of NVivo then please contact the RCBN. We are now examining the need to look at the comparative use of different qualitative data analysis computer software packages.

BERA Annual Conference 2002

The RCBN are organising a symposium at Exeter entitled 'Building Research Capacity in the UK'. We will be presenting the findings of our consultation exercise alongside strategies for building educational research capacity. Please join us to discuss and debate this important topic.

TLRP Phase III

The RCBN have now begun to work with research teams shortlisted for the TLRP Phase III. We are providing assistance, when requested, with the methodological outlines of their full applications.

Forthcoming RCBN conferences

Action Research Conference: Principles, Challenges and Future Directions

November 1st 2002, Cardiff

There is growing and renewed interest in action research. This has been stimulated from different directions, including: participatory and collaborative approaches to research; user-led research; advocacy-based services; feminist research and evaluation; practitioner research and the teacher as researcher; reflective learning and learning organisations; government and academic concerns about research impacts.

Speakers include: Professor Peter Reason, Director at the Centre for Action Research in Professional Practice, University of Bath; and Professor John Elliott at the Centre for Applied Research in Education, University of East Anglia.

Contract Researchers Conference

November 7th-8th 2002, Hanover International Hotel, Cardiff

This is a two-day conference in comfortable surroundings for new researchers on fixed-term contracts. The conference will include: establishing contact between contract researchers in education; the BERA Concordat; networking; building a research career (including getting publishing and applying for research funding) and exploring strategies for individual research capacity building.

For more information on these two conferences or other RCBN activities then please visit our website: www.cardiff.ac.uk/socsi/capacity

ESRC Teaching and Learning Research Programme Research Capacity Building Network

Project Director

Stephen Gorard
gorard@cardiff.ac.uk

Project Administrator

Helen Taylor
taylorh1@cardiff.ac.uk

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Editors

Stephen Gorard, Project Director
Chris Taylor (TaylorCM@cardiff.ac.uk)
Karen Roberts (RobertsK@cardiff.ac.uk)

Correspondence

Cardiff University School of Social Sciences
Glamorgan Building
King Edward VII Avenue
Cardiff CF10 3WT
Tel. +44(0)29 2087 5345
Fax. +44(0)29 2087 4678

Cardiff University School of Social Sciences

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