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### Accelerating the development of Expertise: A Step-Change in Social Science Research Capacity Building

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## ACCELERATING THE DEVELOPMENT OF EXPERTISE: A STEP-CHANGE IN SOCIAL SCIENCE RESEARCH CAPACITY BUILDING

by ALISON WRAY and MIKE WALLACE, *Cardiff University*

*ABSTRACT:* It is argued that future research capacity building for the social sciences needs to incorporate methods to accelerate the acquisition by researchers of holistic expertise relevant to their roles as researchers and as developers of others. An agenda is presented, based on a model of learning that highlights missing elements of current provision, and two approaches currently under development are described.

*Keywords:* research expertise, capacity building, expert thinking, research coaching, learning support, training trainers

### 1. INTRODUCTION

This paper makes a case for extending the scope of capacity building in the social sciences, by developing methods for speeding up the acquisition of research expertise by early and mid-career researchers. Such expertise is required for conducting sophisticated research as a contextualised ‘social practice’ (Rees *et al.*, 2007) within and across the boundaries of disciplines or fields of enquiry. Its importance in relation to the primary researcher role is significantly extended when, as is customary within academia and beyond, researchers are called upon to adopt the secondary role of supporting the research-related learning of others.

The ultimate goal of research capacity building is surely to develop researchers’ expertise in all aspects required for the creation and long-term sustenance of excellence in research (divergence over what is to count as expertise and excellence notwithstanding). Arguably, expertise is a holistic attribute, and the capability to express it adds up to more than the sum of the myriad parts constituting the subject matter of orthodox developmental interventions. The enhancement of expertise is rarely addressed head-on through current training opportunities, and it generally remains deeply implicit as a goal. Typically, provision focuses on one discrete element of the research endeavour, such as advanced statistics, qualitative analytic techniques, or writing applications for research funding. Provision of this kind is necessary but not sufficient, because it tends to leave participants relatively unsupported in relation to the additional learning required to integrate new areas of knowledge and skill into an overall research capability. One challenge for integration is the emergent ambiguity over how to put into operation a generalised technique in addressing the specifics of an investigation-at-hand. Another,

prevalent in pluralistic fields of enquiry, such as education, occurs where an advocated theoretical or methodological approach reflects assumptions that contradict those to which a researcher already subscribes (Hodkinson, 2004). So without a structured approach for supporting such integration, puzzles and conflicts may remain unresolved, and individuals' potential to develop expertise only partially realised. The remaining sections of the paper build up our case.

Section 2 argues for a step-change in research capacity building, where interventions to promote the acquisition of discrete areas of knowledge and skill are complemented by greater attention to supporting the reflexive integration of what has been learned through such episodes into the holistic capability to address increasingly complex research problems. Section 3 then examines the nature of expertise, justifying recognition of particular advanced thinking skills that characterise the social science research expert. It is also argued that knowing how to bring on junior colleagues is a fundamental expert skill, which needs to be nurtured in its own right, for the twin purposes of strengthening primary expert capability and widening access to opportunities for developing expertise throughout a researcher's career. Section 4 draws on a model of learning support to pinpoint mechanisms for timely and effective training interventions. Section 5 illustrates a future agenda embodying training initiatives we are currently developing for the purpose. Finally, Section 6 presents a broader agenda for higher education institutions (HEIs), policy makers and researchers.

A brief caveat before proceeding further. We appreciate that the notions of 'research' and 'expertise' are social constructs that serve sectional academic and political interests. As such, they are inherently open to different interpretations within the diverse traditions (Gadamer, 1979) to which particular social science communities subscribe. It follows that there is no single position regarding which forms of enquiry are to count as research and what consequently counts as increasing expertise in their conduct. However, our concern is merely pragmatic – to enhance the capability of researchers to do what they regard as research and to help others learn to do it. The hermeneutics of research are a secondary matter in this pursuit, and fall outside our frame of reference here.

## 2. COULD DO BETTER – AND WHY IT MATTERS

### *Quality within the Research Community*

Let us focus on potentially addressable limitations that occur even in the UK, with its strong international reputation for social science. According to the delivery plan of the government-sponsored Economic and Social Research Council (ESRC), the UK's largest funder of social science research (ESRC, 2010a, p. 1): 'The UK has an outstanding social science research base with most areas considered to be exceptional by world standards.' The national level of investment in social scientists is certainly high. The ESRC demographic review (Mills *et al.*, 2006) records that there were around 25,000 academic social scientists in 2003/04, of whom roughly 14,000 were significantly 'research active'. About 2,700 students gained a PhD degree in 2000/01, suggesting that there were

roughly 7–8,000 PhD students overall at that time. Also, a significant number in practically-oriented fields, including education, study for professional doctorates. At any time, a research active individual can be conceived as having travelled some way along a learning trajectory (albeit varying and often non-linear) towards acquiring greater expertise as a researcher and, if occupying an academic post, probably also as a developer of the next generation of researchers. Maximising research excellence, long-term, depends on promoting both. Any absence of the finer skills of the expert researcher and researcher developer will potentially impact in two ways – through lower quality research, and through an impoverished learning environment for emergent researchers, where development support from their more established counterparts is lacking. To the extent that expertise can be developed through the experience of targeted support opportunities, and through observation and imitation, the absence of reliable expertise at the ‘top’ of the career ladder is unlikely to be conducive to its reliable development at the ‘bottom’.

Criterion-referenced evaluations suggest that room for improvement exists. Between 1995 and 2009, academic peers graded only a quarter of completed ESRC-funded research projects as ‘outstanding’ (ESRC, 2009a, p. 53). The RAE, the UK’s national assessment of research activity, which evaluates the research output selected by HEIs as their very best, awarded grades of international excellence (4\* and 3\*) to only around half the submissions (RAE, 2008) – both across all subjects, and in the social sciences.

The tantalising prospect arises of increasing national research quality overall, if capacity-building could even modestly accelerate individual progress along the learning trajectory towards greater expertise.

Obviously, alongside workplace opportunities and employment constraints (most starkly for contract researchers), endemic differences in the talent and drive of individual researchers will affect how far they can progress along this trajectory, whatever learning support is on offer. To assume that acceleration efforts could turn every researcher into an internationally-recognised expert would be naïve. A more realistic aspiration is to create conditions encouraging all individuals to proceed at the maximum pace possible for them, both in training settings and workplace practice.

### *Current Capacity Building and its Limitations*

While the expansion of capacity building provision has generated more learning opportunities for researchers, the burgeoning of topics risks fragmenting recipients’ learning experiences. HEI postgraduate social science research training provision has been strongly influenced by the ESRC. The recently superseded guidelines governing HEI recognition as ‘outlets’ for ESRC-funded PhD studentships (ESRC, 2005) included lengthy content lists of expectations covering ‘general research skills and transferable skills’, ‘subject-specific domains of expertise’ (substantive knowledge) and ‘research methods training’ (knowledge of widely used data collection and analysis methods) for each subject within the

ESRC's remit. Arguably, these guidelines have tended to promote atomistic learning, not least because there will naturally be a desire to use different experts to teach specific techniques and approaches. Yet part of what makes someone an expert on, say, particular statistical methods, is the capability creatively to apply them in the complex context of a specific research objective – requiring integration of this knowledge with other areas of knowledge and experience. It is not that the individual skills should never be taught discretely, but that any methods and techniques that are not subsequently central to the researcher's immediate project are unlikely to be consolidated into their deeper understanding.

With the advent of the ESRC's Doctoral Training Centres (DTCs) scheme from October 2011, HEIs now self-accredit approved pathways for training. New guidelines for developing these pathways include a range of desired learning outcomes (ESRC, 2009a). They could enable DTCs to offer distinctive approaches to training that are more holistic in relation to accelerating expertise, but do not explicitly require it. Thus, the new DTC approach does not appear to safeguard against students receiving serial inputs that seem to them disparate, compartmentalised and abstract.

A similar compartmentalism remains a risk for employed researchers – with or without a doctoral degree – whether located in academic environments or in non-academic ones (such as government departments). There is no lack of training provision, but arguably the capacity to locate new learning within the researcher's own developing holistic knowledge of how to do research well is under-supported. Typical existing provision offers cumulative chances to acquire more expertise within a narrow compass, through prolonged participation in conducting aspects of research, often under the direction of the more senior researchers who designed it. The quality of the 'training' in this context can be hit and miss. In addition, they will be eligible for various openly-available training opportunities which could expand their horizons. Indicatively, the ESRC has made multiple research capacity building investments that recognise the need to support the career-long learning of individuals and groups of researchers. Thus, one developmental research opportunity enables early career researchers to direct their own project with support from an experienced research mentor. A brochure of support for researcher development (ESRC, 2010b) listed nine schemes providing training opportunities for researchers at all career stages. A further 24, not designed primarily as capacity building interventions, have strong development potential, because they involve data resources, bibliographical databases, and guidance on how to use such resources. While a few schemes are being merged and others terminated due to current financial constraints, a substantial array is set to continue.

The following strategic investments illustrate the variety of ESRC approaches to research capacity building:

- The National Centre for Research Methods, established in 2004 to combine diverse advanced methods research with capacity building that spans training workshops, a research methods festival, and methodological networks;

- The Researcher Development Initiative (RDI), launched in 2005 to catalyse researcher development, comprising projects which offer training for researchers in their primary researcher or secondary role as developer of other researchers, or developing new e-learning resources;
- The Research Capacity Building Network, funded from 2001 to 2005 to support the Teaching and Learning Research Programme (TLRP). This was the first capacity building investment promoting a priority field of enquiry (education) and its activities included training workshops, seminars, and developing and disseminating information about resources;
- The ‘social practices’ stage of TLRP capacity building from 2005 to 2009, designed to embed processes for developing research expertise within the researchers’ practice. Links were established with the Applied Educational Research Scheme (AERS) in Scotland which combined distance learning modules with mentoring of relatively novice researchers who participated in a set of research projects;
- The Advanced Institute of Management Research (AIM), based on the innovative principle of investing in ‘people not projects’. Since 2002, AIM has supported cohorts of fellows in developing their own research profile – in part through an individual project, in part through collaborating on joint research activities. It also offers capacity building workshops and seminars for other researchers;
- Capacity building networks in priority disciplines, notably several pilots in education supported by TLRP, such as the Social and Professional Network for Early Career Researchers in Education.

Note how AERS has directly promoted the development of research expertise through a supported research project experience. AIM has done so through fellows’ own research projects, and has also fostered their expertise as researcher developers through the opportunity to mount capacity building activities.

However, traditional face-to-face inputs at workshops or seminars, where participants are drawn from different institutions, feature strongly in most of these investments. Furthermore, according to an NCRM ‘training needs’ survey (Wiles *et al.*, 2005), researchers regard short workshops of up to a day as the most useful capacity building events, followed closely by seminars. This perception may simultaneously reflect and perpetuate a key assumption about what training is for, since day workshops and seminars are often a means of transmitting explicit or propositional knowledge (Rees *et al.*, 2007), rather than effecting more integral changes in perception or approach. Participants are generally left to make for themselves the links to their prior knowledge, and to integrate for themselves what they have learned into their practice. Yet doing so may not be straightforward. An impact evaluation of NCRM’s capacity building provision (Bardsley, 2010) found that while over 90 per cent of respondents reported one or more training benefits, only a minority reported that it had ‘significantly’ or ‘greatly’ increased their ability to do research.

Ironically, there is also often limited recognition amongst trainees that it is difficult to integrate learning without being embedded in an environment that encourages it. In their 'training needs' survey, Wiles *et al.* found that placements were held in low regard despite offering close support with integration of ideas into practice via sustained research engagement. The chronic problem with 'no-shows' at research capacity building events may equally reflect, in part, a lack of appreciation – amongst those who stay away – about the importance of participation for supporting their learning.

More attention needs to be paid, therefore, to helping participants successfully integrate inputs into their research practitioner repertoire, as a contribution to their developing expertise – and to realise the potential for training to do that. It has long been demonstrated that, for complex teaching tasks, 'transfer of training' into practice is greatly increased if the challenge of integration is addressed, whether through peer coaching or other by-the-elbow support (Joyce and Showers, 2002). The AERS investment mentioned above illustrates the applicability of transfer of training to research capacity building. For these reasons, we shall discuss later how capacity building could benefit from the incorporation of strategically planned coaching and mentoring.

### *Upping the Ante*

Added pressure for doing better comes from expanding expectations of social science researchers, demanding even greater maturity and expertise (e.g. ESRC, 2009b, 2010a). First, funders increasingly expect research to demonstrate desirable economic or social impact, which can affect the very conceptualisation of a project – from preliminary design to outcomes. The impact agenda also entails engagement with diverse non-academic audiences, requiring the capacity to articulate complex ideas comprehensibly. Second, the ESRC's (2010b) newly raised lower threshold for research grants underlines the broader move away from funding social science research as a 'cottage industry', where autonomous lone researchers pursue their own interests through relatively small-scale work. Indeed, leading researchers are being encouraged to collaborate in addressing major research questions through large-scale and often interdisciplinary projects. Third, a burgeoning array of electronically accessible datasets is available for social scientific research – whether emergent during longitudinal studies, a legacy of funded projects, or produced by other agencies. More researchers are being expected to design studies which mine such data. Fourth, the ESRC is investing in the development of innovatory research methods, many of which harness the potential of new electronic technologies (from visual research methods to novel multilevel modelling techniques). Researchers are being encouraged to take up these methods through the capacity building work of NCRM. Fifth, longer-established researchers find that expertise gained in the distant past is no longer sufficient for either research or developing others. They are under pressure to update themselves by engaging with contemporary methods and new technology.

Meanwhile, the extant intensification of work experienced by the research community is being ratcheted up through the imperative to ‘achieve more with less’ (ESRC, 2010a, p. 2) in today’s climate of financial austerity. It will become increasingly difficult to ensure the timely acquisition of greater expertise without targeted training and other forms of learning support. Let us now explore possibilities for addressing this challenge.

### 3. WHAT IS EXPERTISE?

#### *Basic Parameters*

Defining expertise is a necessary starting point for identifying means of accelerating its development:

Expertise develops slowly and is characterised by a large, integrated knowledge base; sophisticated mental models of a domain that guide problem solving and critical thinking; highly automated procedural skills; and excellent monitoring skills within the domain. (Shraw, 2006, p. 259)

Shraw’s general description translates well into the social science realm. An expert social science researcher performs complex and often problematic tasks by combining knowledge and skills accumulated and updated through different kinds of relevant experience. The capability to approach such tasks in ways that are creative, sophisticated, ethical and responsive to emerging circumstances is a hallmark of expertise. It is a product of extensive and cumulative learning from multiple experiences – as established researchers can attest simply by reflecting on how much they have learned since their novice days.

However, there are other, subtle factors at play. Experts in domains such as chess and running can be objectively identified as ‘consistently able to exhibit superior performance for representative tasks’ (Ericsson, 2006, p. 3). But social science research experts are identified subjectively by their peers – in research assessment exercises, career promotion and the entry via nomination to professional bodies, such as the ESRC’s Peer Review College or the Academy for the Social Sciences. Gaining peer recognition may depend as much on how well-known and networked someone is, and how they sell themselves (Shanteau, 1988, p. 210), as on their actual knowledge or performance.

Furthermore, the effective communication of one’s expertise can play a significant role. Whereas most evidence of expertise is retrospectively evidence-based (Chi, 2006, p. 21), experts are *prospectively* identified when research funding is awarded. Judging the likelihood of a proposed project making an outstanding contribution to knowledge rests partly on retrospective evidence – the track record, CV and references – but also on indications that the applicant is capable of turning the bid into an insightful investigation. Applicants who lack confidence may under-promote themselves, fail to pass muster with assessors and consequently not develop the track record needed for later applications (Shanteau, 1988, p. 210).

The risks inherent in subjective evaluations of expertise can be one reason why some researchers will fail to achieve their potential without support. Capacity-building offers considerable scope for altering the learning and career trajectories of those who wish to develop their expertise, but who have not known how to go about it.

*Targets for the Accelerated Learning of Expertise in Social Science Research*

Shraw's observation that 'expertise develops slowly' (2006, p. 259) raises the question of whether accelerated learning is possible. Certainly, some features of expertise, and factors determining its achievement, are more amenable to training than others. It is therefore important to establish which are worth targeting, and to understand why attention to them might have an effect on the development of expertise as a whole. Shraw (*ibid.*) and Shanteau (1988, pp. 209–211) jointly offer these key characteristics of expertise:

- (1) *Knowledge and skills*
  - Large, integrated and up-to-date knowledge base relating to the substantive area.
  - Highly automated procedural skills.
  - Excellent monitoring skills.
- (2) *Information processing*
  - Ability to see patterns of information, supporting sophisticated mental models of a domain that guide problem-solving and critical thinking, including:
    - a sense of what is relevant and irrelevant when making decisions;
    - an ability to simplify complex problems;
    - an ability to reinterpret difficult decisions in novel ways.
- (3) *Personality*
  - Ability to handle adversity.
  - Sufficient emotional distance to be selective about which problems to tackle.
  - Confidence in decision-making ability.

However, this list leaves implicit some aspects of expertise with importance for social science research, which could usefully be addressed more explicitly:

- (4) *Integrated research knowledge and skills in relation to research*
  - Ability to:
    - combine a range of skills and knowledge into a complex whole;
    - differentiate between interesting research questions that are and are not answerable within the existing paradigms available;
    - identify and arbitrate between several candidate approaches suitable for researching a question;
    - recognise the range of possible outcomes of the research, contingent upon the underlying variables and the methodology adopted;

- understand where a new piece of research will fit into the existing body of research literature and how different possible outcomes would impact on it;
- evaluate the level of risk entailed in a new endeavour and operate at the limits, to maximise potential gain.

(5) *Interactional style*

- Ability to communicate expertise to others effectively – recognising the importance of being *perceived* as an expert – by presenting ideas, findings and conceptualisations in a way that is comprehensible yet appropriately comprehensive, according to audience.

Interactional style may also include more specific ‘interactional expertise’, which makes possible desirable discussions between experts in different domains:

Interactional expertise is often the medium of specialist peer review in funding agencies and in journal editing where the reviewers are only sometimes contributors to the narrow specialty being evaluated. It is the medium of interchange within large scale science projects, where again not everyone can be a contributor to everyone else’s narrow specialty. (Collins *et al.*, 2006, p. 659)

Interactional expertise is achieved by becoming familiar with the domain discourse as a means of understanding, in the absence of primary research expertise, how practitioners in that area experience their research activity. While it carries huge potential benefits, there are also risks. Researchers need to be cautious about coming to believe they have adequate command of the knowledge in another domain, just because they command the discourse used to discuss it.

The combined list suggests a top-level characteristic of expertise: the possession of a kind of ‘super-knowledge’ that we shall term ‘expert thinking.’ It entails a capability to integrate different types of knowledge, and an understanding of what to do with knowledge. Thinking is possibly the most difficult feature to pin down, and the one that experts are least able to articulate. Shanteau observes of experts that they ‘generally are inarticulate about the processes used to make decisions’ due to their automatic application of procedures. Ericsson and Lehmann (1996, p. 291) disagree: ‘Contrary to the belief that expert performance is highly automatised, most types of expert performance are mediated by reportable thoughts involving planning, reasoning, and anticipation’. Perhaps the individual components of the process by which actions and decisions are taken are relatively open to scrutiny, while an instinctive, tacit quality to this higher-level expert-thinking defies easy explanation.

### *Homing in on Expert Thinking in the Social Sciences*

Even experts struggle to discuss their thinking. But it is worth exploring what expert thinking probably entails, as a precursor to exploring how its development could be accelerated. Four key characteristics can be identified.

- *Chunking*: Chess masters are recognised to organise information into complex chunks, so that they can handle more of it, and so see further ahead in prospective developments of the game (Ericsson, 2006, p. 11). Social science researchers may also package information, using their experience to spot likely patterns of cause and effect, the better to foresee and interpret possible outcomes.
- *Restructuring*: As with chess, a major function of experience in social science research may be in providing the means by which knowledge is reorganised to reveal new possibilities and relationships (Ericsson, 2006, pp. 13–14).
- *Touching boundaries*: Expertise is recognised to be ‘domain-limited’ (Chi, 2006, p. 24) and, within that, bound by the ‘rules’ of customary engagement (for instance, chess masters are good at memorising permissible moves but not random ones). So an aspect of expertise transferable to the social sciences could be the capacity to recognise, by virtue of knowing how to think *inside* the box, when it is appropriate and productive to think *outside* it.
- *Coping with ignorance*: evidence across domains of expertise from typing to judging at an agricultural show confirms that experts do not know everything, but rather know how to handle what they do know and manage the gaps in their knowledge (Chi, 2006, pp. 23–24).

### *The Expert as Leader and Mentor*

Before considering how expert-thinking can be accelerated, one final aspect of expertise in social science research must be discussed: management and mentoring capability. It is part of the expectations placed upon many – if not most – researchers employed in academic and other institutions that they lead others, whether a project team, junior mentees or postgraduate students. Hoffman *et al.* (2009, p. 19) summarise work by Klein regarding the skill of the expert mentor:

The good mentor knows how to create appropriate learning content and guide those who are less experienced. The expert mentor can rapidly form a rich mental model of the learner’s knowledge and skill. From this, the expert mentor can predict when and why the learner will form a simplistic or inaccurate understanding. The mentor anticipates the kinds of cases that will lead the learner to err and the kinds of practice experiences that will push the learner to greater understanding of complexity.

While most research capacity building focuses on supporting learning in the primary research role, we suggest that it could do better in embracing the development of the broader range of expertise, including that of the mentor.

Table 1 offers an ideal-typical representation of social science researchers’ career stages. It offers a succinct means of illustrating how common expectations about the accumulation of the researcher’s own expertise become paralleled, after the earliest stages, by supporting the process in others. Of course, as an ideal type, this portrayal does not reflect the empirical diversity of researchers’ career

TABLE 1: Cumulative research-related expectations at different career stages

Career stage	Roles	Cumulative Expectations of Task Achievement
<b>STUDENT, POSTDOC</b>		
<i>Postgraduate, doctoral student, post-doctoral researcher</i>	<b>researcher</b>	<i>research</i> <ul style="list-style-type: none"> <li>● write thesis proposal</li> <li>● conduct small-scale thesis research</li> <li>● write up thesis</li> <li>● publish outcomes</li> </ul>
<b>EARLY CAREER</b>		
<i>Contract researcher</i>	<b>researcher</b>	<i>research</i> <ul style="list-style-type: none"> <li>● contribute to conduct of funded research project</li> <li>● contribute to publishing outcomes</li> </ul>
<i>Beginning lecturer</i>	<b>researcher</b>	<i>research</i> <ul style="list-style-type: none"> <li>● write proposal for small funded research project</li> <li>● conduct small-scale funded research project</li> <li>● publish outcomes</li> <li>● contribute as team member on substantial project</li> </ul>
	<b>trainer of students as researchers</b>	<i>researcher development</i> <ul style="list-style-type: none"> <li>● support development of contract research staff</li> <li>● review journal articles</li> </ul> <i>researcher development</i> <ul style="list-style-type: none"> <li>● teach research methods</li> <li>● co-supervise postgraduate, doctoral and postdoctoral researchers</li> </ul>
<b>MID-CAREER</b>		
<i>Experienced lecturer, beginning professor</i>	<b>researcher</b>	<i>research</i> <ul style="list-style-type: none"> <li>● write proposal for substantial funded research project</li> <li>● conduct substantial funded research project</li> <li>● publish outcomes</li> <li>● lead research project team</li> </ul>
	<b>trainer of students as researchers</b>	<i>researcher development</i> <ul style="list-style-type: none"> <li>● review proposals for funded research</li> </ul> <i>researcher development</i> <ul style="list-style-type: none"> <li>● supervise postgraduate, doctoral and postdoctoral students</li> <li>● examine doctoral student theses</li> </ul>
	<b>developer of academics</b>	<i>researcher development</i> <ul style="list-style-type: none"> <li>● conduct appraisal</li> <li>● mentor early career academics</li> </ul>
	<b>research leader</b>	<i>research</i> <ul style="list-style-type: none"> <li>● lead research group</li> </ul> <i>researcher development</i> <ul style="list-style-type: none"> <li>● develop research group members</li> <li>● promote research group-wide collaboration</li> </ul>

(Continued)

TABLE 1: (Continued)

Career stage	Roles	Cumulative Expectations of Task Achievement
SENIOR <i>Experienced professor</i>	<b>manager of research training/ supervision</b>	<i>researcher development</i> <ul style="list-style-type: none"> <li>● manage doctoral research or research methods teaching programme</li> <li>● manage staff development</li> </ul>
	<b>manager of institution- wide research development</b>	<i>research</i> <ul style="list-style-type: none"> <li>● develop and sustain institution-wide research</li> <li><i>researcher development</i></li> <li>● recruit and retain staff</li> <li>● develop and sustain research-related teaching</li> <li>● develop staff research capacity</li> </ul>

experiences. Nor does it imply a normative assumption that any individual should proceed from one stage to the next. What the table does do is underline the importance of researchers' own learning being adequately anchored (even if it is not yet complete) by the time the expectation is placed on them to support the learning of others. The TLRP's 'Mapping the Ripples Project' (Fowler *et al.*, 2008) showed that when experienced educational researchers actively supported the development of the research staff on their projects, it had a significant positive impact on the latter's learning. The effect was most pronounced where the expert engaged directly with the precise strengths and needs of the project staff:

Central to many researchers' positive evaluations was the sense that a more senior colleague had an appreciation of the expertise which the individual currently had and a sense of the potential that person might realise in the future. (Fowler *et al.*, 2008, p. 3)

The importance for less experienced researchers of having good role models – both as researchers and as researcher-developers – is evident. However, there may be a balancing benefit for the established researcher too. Developing the full range of expertise may in fact rely on, rather than simply coexist with, this support role. There may be key aspects of expertise, such as the ability to explain complex ideas to a range of audiences, and the ability to cope with information from outside one's own range of thought, that develop through the opportunities presented by interacting with junior researchers.

By mid-career, some researchers are expected not only to deliver but also manage this developmental support, perhaps as directors of doctoral or research methods programmes. Developing the capability directly to support others' learning as researchers and to do so indirectly by managing developmental programmes entails acquiring complementary forms of *pedagogic* and *managerial* expertise. Yet 'training trainers' and 'training managers of training' foci are relatively rare in research capacity-building. We propose that more attention could profitably be

paid to promoting the development of pedagogic and managerial expertise as a strategic means of developing the research expertise of others.

### *Towards a Method for Accelerating Expertise*

As noted earlier, Shraw (2006, p. 250) implicitly challenges the claim that accelerated learning is possible in relation to expertise, because ‘experts become experts slowly through years of hard work, deliberate practice and guidance from other experts.’ However, we believe that key learning contributing to the development of expertise can be effectively achieved – even the intangible super-knowledge that is expert thinking, much as Hoffman *et al.* (2009, p. 18) propose:

To accelerate proficiency, we must facilitate the acquisition of extensive, highly organised knowledge. We must also accelerate the acquisition of expert-level reasoning skills and strategies.

Putting into operation accelerated learning of this kind evidently will entail more than the assembly of information or skills-based inputs – these are already part of the standard research training that we have described as compartmentalised. Our approach needs to include methods for creating new links between types of knowledge. Importantly, to free up researchers’ thinking, it also needs to address affective factors that may typically impede development, particularly lack of direction and strategy, inadequate perspective, inconsistent levels of motivation, and low – or excessively high – self-confidence.

Furthermore, effective interventions to accelerate expertise require an understanding of how learning takes place. In particular, it needs to be clear when interactional expertise – talking *about* research experience – is and is not a legitimate substitute for years of experiential learning. Training experiences that amount to simulations in an artificial environment may not be an adequate substitute:

Task simplification and the use of novel and artificial tasks are antithetical to reproducing the ‘real-world’ demands faced by actual domain experts. Changing the nature of the phenomenon under investigation may lead to a reduction, if not eradication, of the expert advantage. (Ward *et al.*, 2006, p. 243)

For this reason we next consider how a practical model of learning and learning support can guide the development of appropriate methods for accelerating the development of expertise.

#### 4. MODELLING SUPPORT FOR LEARNING OF RESEARCH EXPERTISE

Interventions to accelerate the development of expertise must realistically focus on particular skills, since some aspects of expertise are more amenable to short interventions than others. Also, training typically involves a group of people, each already possessing – and aspiring to increase – their individual diverse body of

knowledge and skills. A means must be found to deliver to the collective an experience that is meaningful and timely for each person, and that, if possible, harnesses productive differences in individual needs and knowledge.

We base our proposal on a model of learning and learning support originally developed for training in managerial expertise by one of us (Wallace, 1991, 1999). We believe it can be applied to interventions promoting aspects of social science research expertise. Theoretical and empirical underpinnings include: experiential learning theory (Kolb, 1984) – though real workplace experience is distinguished from the vicarious experience offered by simulations; Oakeshott's (1967) distinction between propositional and practical knowledge; the notion of 'incidental learning': that subset of informal learning which is a subliminal by-product of some other activity (Marsick and Watkins, 1990); and the meta-analysis of research on training transfer by Joyce and Showers (2002).

Figure 1 presents Wallace's model of the sequence of stages in the learning process. The idea that researching may be conceived as the *skilful performance of research-related tasks* within roles is implicit in the aspects of expertise listed above. Skilful performance implies integrating knowledge and skills (propositional knowledge/knowing that, plus practical knowledge/know-how) and attitudes. The learning of skilful performance is at heart individual. But it can be stimulated and enhanced through collective engagement with other learners and facilitators, whether in formal training settings, informal networks or 'communities of practice' (Wenger, 1998). Particular components of learning support may promote *transitions* between learning stages, as in using a diagnostic instrument to raise the researcher's awareness of scope for development.

The *sequence of stages* begins with the learner's existing performance, and entails some form of challenge or new aspiration stimulating the motivation to learn. The next two stages are not intrinsic to the skilful performance of tasks – one can learn a skilful performance without knowing why it is worth doing. However, both stages can valuably inform learners' choices about whether it is justifiable to engage in this learning, and if so, the rationale for how they should go about it.

At the point where researchers have a rationale for improving their performance, they need to develop practical ideas about how to do so. This is made possible by learning support – through training or self-study – to establish what options there are (practical information). Having developed ideas about how to proceed, skills training may be needed to enable the ideas to be put into practice. The final stage in achieving the targeted improvement in research performance is made possible by means of integrating the new knowledge and skills with the old.

Very few learning support activities are capable of providing comprehensive help for all stages in the learning process, and learners are not wholly dependent on having them. Many make unsupported transitions gradually for themselves through incidental learning. However, there is a risk that some may not progress, whether through lack of time, because they fail to understand what a new practice entails, or because they lack confidence or motivation.

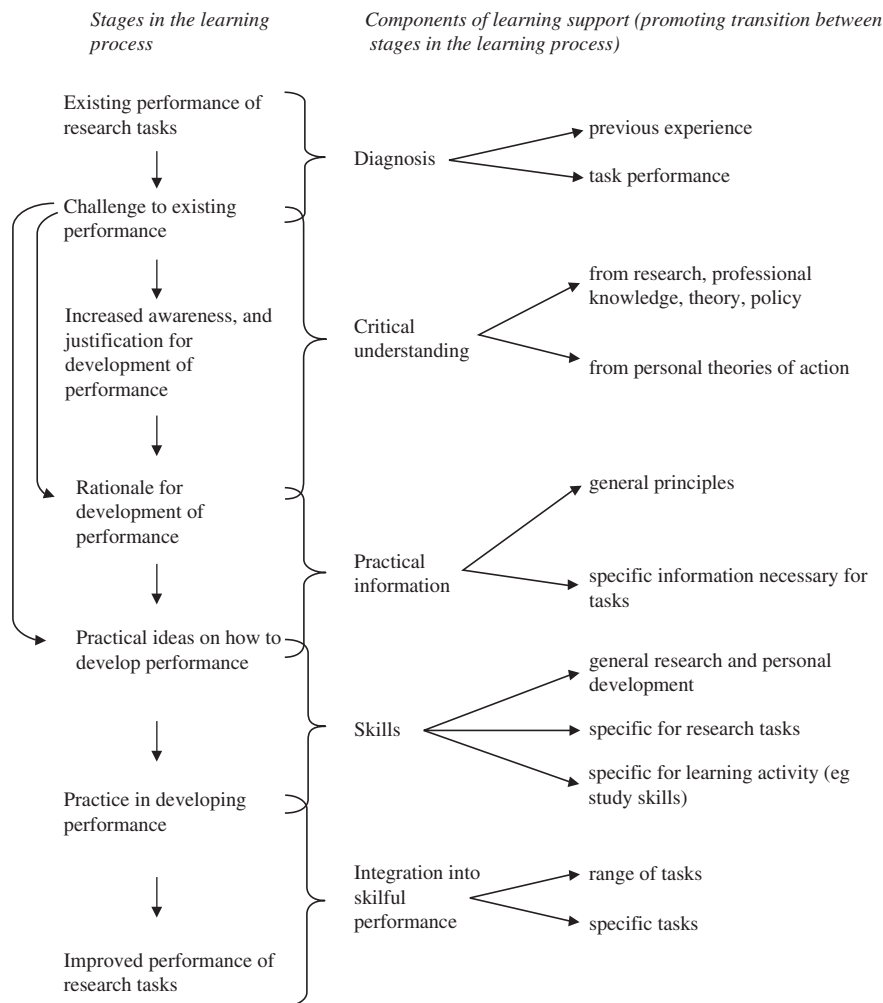


Figure 1. Learning skilful performance and its support

Learning support can target and accelerate learning particularly well across certain stage transitions. Most common in training provision is support for the transitions that are strongly cognitive: critical understanding and practical information (as offered by the research capacity-building workshops and seminars described earlier). Less common is support with diagnosis, skills learning and the integration of knowledge and skills into skilful performance in the real work context of use, or 'learning transfer'. Effective support with this last transition can greatly enhance the impact on performance, compared with support that targets only diagnosis, the cognitive transitions, or practising skills. The proposals outlined below attempt to fill this gap in support provision.

To complete our case and move towards those proposals, the learning model needs aligning with our earlier observations about the key characteristics of expertise. A practical way in is to employ these characteristics as the basis of an expertise development diagnostic. The researcher might ask, do I have:

- An adequate, up-to-date and integrated knowledge of my research area?
- The capability to undertake familiar procedural activities in an efficient, automated way?
- The capability to monitor my performance and knowledge accurately and honestly?
- The capability to see patterns of information, discern what is relevant and irrelevant when decision-making, simplify complex problems, and reinterpret difficult decisions in novel ways?
- Strategies for handling the situation when things go wrong?
- Sufficient emotional distance from my work to be selective about which problems to tackle and which to leave?
- Confidence in my decision-making ability?
- The skill to communicate my expertise effectively to others?
- The larger picture of how my skills and knowledge fit together?
- The critical capability to differentiate between interesting research questions that are and are not answerable within available paradigms?
- The critical capability to identify and arbitrate between different approaches for researching a question?
- An adequate understanding of the topic and its investigation to recognise the range of possible outcomes of the research, contingent upon the underlying variables and the methodology adopted?
- An adequate understanding of the state of the field to recognise where a new piece of research will fit into the existing research literature and how different possible outcomes would impact on it?
- The circumspection to evaluate risks entailed in a new endeavour and operate at the boundary of knowledge, to maximise potential gain?
- The interactional skills to present ideas, findings and conceptualisations in a way that is comprehensible yet appropriately comprehensive, according to audience?
- The balance of competence and openness needed to engage productively and honestly with experts from other disciplines and fields?
- The skills set and commitment to provide constructive learning support for less experienced researchers as they begin to develop themselves towards expert status?

Learning support interventions would stimulate the exploration of these questions, or respond where researchers have already answered 'no' to one or more of them. The support offered to researchers would be a mixture of bespoke, one-to-one

support and group input and activities capable of providing several learning points, to be adopted as appropriate by different participants. Table 2 thus develops the model in Figure 1 by listing indicative learning support activities that interventions could employ to promote particular learning stage transitions.

TABLE 2: Activities promoting particular learning stage transitions in developing research expertise

<i>Components of learning support (promoting transition between stages in the learning process)</i>		<i>Indicative activities for accelerating the development of an aspect of research expertise</i>
Diagnosis	previous experience	Curriculum vitae review; learning needs analysis questionnaire
	task performance	Research design exercise responding to a cross-disciplinary social problem; research agenda-setting seminar presentation and discussion
Critical understanding	from research, professional knowledge, theory, policy	Extending participation to a broader variety of research conferences and seminars; guidance on reading into new literatures
	from personal theories of action	Reflective personal learning journal; engagement event with a greater diversity of other stakeholders
Practical information	general principles	Input on expert thinking strategies; guided reading about parallel areas of enquiry in other disciplines
	specific information necessary for tasks	Instruction on new electronic research resources; scrutiny of protocols for ethical clearance
	general research and personal development	Extending collaboration on joint tasks to a wider range of other researchers; personal expert development planning
Skills	specific for research tasks	Hands-on workshop giving practice in pre-empting and solving research project problems; designing a survey instrument for a new topic
	specific for learning activity (e.g. study skills)	Structuring an academic paper; developing a proposal for research on a larger scale; e-learning tutorial on mining a new database
Integration into skilful performance	range of tasks	Receiving research coaching; participation in a research project with mentoring from research leader
	specific tasks	Piloting new data collection instruments; e-networking to increase mutual competence in a new data collection technique

## 5. TWO APPROACHES TO LEARNING SUPPORT FOR ACCELERATING THE DEVELOPMENT OF EXPERTISE

Table 2 hints at the sorts of support that might be used to achieve the interventions we are recommending. Here we discuss our initial thinking on two approaches to learning support that we are developing, exemplifying ways of engaging creatively across the customary boundaries of research training interventions to facilitate a more integrated type of learning.

### *Learning to Think like an Expert*

We are devising pilot research training workshops on ‘learning to think like an expert’ as part of a project within the ESRC Researcher Development Initiative ([www.rdi.ac.uk/projects/round4/51.php](http://www.rdi.ac.uk/projects/round4/51.php)). The ideas described below are experimental, with built-in reviews so that modifications can be made incrementally. Our participants will be early and mid-career researchers, the latter being targeted both as aspiring experts and as trainers and mentors.

The workshops aim to catalyse researchers’ capability to integrate their existing knowledge, skills and experience, and refine their mental map of how their unique combination of these three components of developing expertise fit into the larger picture of research activity in and beyond their field. Since participants will enter the workshop with different learning needs, it is important that the training experience is multi-faceted. Unlike many researcher training workshops, we will avoid assuming that everyone already knows why they are there, what the training is for (in relation to them) and how to maximise the benefit from it. Rather, we plan to trial an individual diagnostic opportunity for each participant – a self-assessment exercise prior to joining the course or a face-to-face interview using techniques from research coaching (see below). This should help participants orientate themselves, acknowledge their own responsibility to seek appropriate benefits from the input, and understand how they can work to embed whatever they learn during the workshop more permanently in their future practice.

Activities that we plan to trial in the workshops are complex group tasks providing participants with personal challenges that can catalyse key transitions across learning stages, including the learning of pedagogic techniques for mentoring. We intend to pose research design and interpretation challenges to groups of participants from different social science disciplines that additionally relate to disciplines beyond the social sciences. The structure of the activities should create and sustain a clear focus on both process and outcomes, to maximise learning. Individuals within the group may be given specific responsibilities (such as ensuring that others are encouraged to contribute in key ways), or instructed to work to particular agendas or under certain constraints (including financial). The idea is to task groups with more than just talking around ideas. They will have to develop them for being put into operation and, as appropriate, draw up specific lists of information to be obtained from outside sources.

A second approach under consideration entails gathering information from international experts about the practicalities of their experience with directing a particular research project. This information will be used to set up ‘part-simulations’ – proxy experiences with real project scenarios. The participants will first work with the scenario, then compare their outcomes with those of the original project director. This approach aims to facilitate opportunities for skills learning and for learning transfer, by feeding the participants’ current knowledge and skill into a real situation (albeit as visitors) and by enabling them to discover the extent and impact of not having certain skills or knowledge that were central to the approach taken by the expert.

The part-simulation approach is designed to exploit the benefits of simulations while minimising their disadvantages. To improve research performance capability, one must ultimately carry out research-related tasks ‘for real’. Full simulations offer an ‘unreal’ experience: simplifying parameters of practice, by design. In their favour, they can support learning through practice in a safe setting where mistakes do not matter. But further learning is then required, to transfer the learning to the real work situation. This transfer cannot be provided even by part-simulations, but the existence of a real world version of the simulated experience considerably narrows the gap between the fiction of an exercise and the detailed complexities of how things really work. Participants will, of course, be able to follow up on their learning by finding out more about the project they simulated, since it really exists.

### *Research Coaching*

Research coaching may form one component of the ‘thinking like an expert’ workshops. However, it is a separate development in our portfolio which can be harnessed towards developing research expertise, especially for the learning transitions of diagnosis and integration into skilful performance. Research coaching, as defined here, is a hybrid of research mentoring and workplace coaching being developed by Wray. It creates a productive interaction between mentoring – typically a power-relationship where the senior party may appropriately advise and direct the junior party into specific actions – and coaching, where coachees are guided and encouraged to identify their own goals and develop an action plan for reaching them.

Mentoring alone can be very productive. However, since mentors are often inadequately skilled in supporting learning, and may have experienced only poor mentoring themselves, there is a risk of stifling mentees by imposing opinions and direction, leaving them feeling inadequate and inhibited from moving forward. Research coaching creates a more creative and self-determining developmental experience, particularly potent for those who have become stuck, lacking the confidence or understanding needed to progress.

On the other hand, research coaching is *not* simply coaching in the standard sense. Coaching (e.g. Downey, 2003; Starr, 2010) is typically defined as ‘hands

off' in that – barring gross ethical breaches – it is acceptable for coachees to define and pursue whatever goal they want. The coach's role is to observe the process, challenge the assumptions of their coachees and help them work out ways to achieve their goals. A coach does not need (and, some coach trainers assert, expressly should not have) specialist knowledge of the client's focus of activity, since it can lead to shared assumptions that then remain unarticulated, or, worse, a no-go zone for explication, since one or both parties may feel vulnerable about admitting ignorance or putting the other on the spot in revealing theirs.

Research coaching blends coaching and mentoring, recognising that supporting researchers in realising their potential for developing expertise does require a measure of shared specialist knowledge, at the level of research culture if not disciplinary specifics. It acknowledges that, alongside the guidance and encouragement to work outside their comfort zone that coaching offers, researchers may require information, advice and opportunities. A research coach must be empowered through the agreement with the coachee to adopt the mentor role at particular points, but be skilled and self-aware enough to revert to the coach role as soon as possible.

This blending also makes more explicit a potential compromise to the coach role that is often seen in the workplace setting: the need to accommodate within the two-way coaching relationship a silent (or not-so-silent) third party – the employer, whose own goals may be different from those of the coachee. Workplace coaching is often only one step away from performance management. Research coaching should resist any pressure to become an agent for this end, but it would be naïve to imagine that a goal-focused agenda for the coachee's development of expertise can be developed without some awareness of the requirements and expectations of the employer. Thus it is more honest and pragmatic to allow the coach, as mentor, to advise on how the two sets of aspirations might be aligned.

In the approach currently being trialled, the research coaching experience consists of four to six one-hour sessions over a period of months. It is preceded by an orientation meeting where the purposes and procedures are outlined, and an agreement is reached between the coach and coachee about mutual honesty, confidentiality and commitment to the development of a specific programme of actions towards a relevant goal. In Session 1, the coachee is invited to review current research activity and examine how it interrelates with other aspects of work and life. This results in a diagnosis of what needs to change, and why. Next, one (or more) relevant aspirational goals are identified – for instance, 'I have forged a significant link between these two disparate fields' or 'I have found a convincing answer to this difficult question'.

Session 2 revisits the goal to ensure it is the right one, and then explores the mechanisms for its achievement. These are the interim stages towards goal attainment. For instance, the coachee might recognise the need to develop greater knowledge expertise in a particular area through targeted reading, learn a new analytic technique, or gain advice from key international experts. For each such element, key practical actions are identified, for example to dedicate less time

to updating next year's teaching so as to do more reading, or to contact some international figures and request the opportunity to visit them.

Session 3, and any subsequent sessions before the last, take place when there has been time for the actions to be undertaken. The coach helps the coachee reflect on which actions were and were not achieved and why, and what should be done next. The coaching orientation helps ensure that any failures or disappointments do not dissipate the vision, but rather are addressed pragmatically with the right balance of understanding and challenge. Meanwhile the mentoring aspect starts to play a role if the coachee has encountered procedural problems in accessing information or opportunities.

The final session is dedicated to ensuring there is adequate potential for a sustained approach to self-development of expertise, since it is neither healthy (because it would foster dependence on the coach) nor feasible for coaching to become a permanent fixture. The coachee is encouraged to decide what sorts of actions, reminders and incentives will support future pursuit of the goal and, in time, develop and pursue new goals relevant to research expertise. In short, the coachee is taught to self-coach. Research coaching is thus designed as a finite, highly structured intervention with clear immediate and longer-term self-developmental outcomes.

In our view research coaching should be undertaken by academic experts trained in the key coaching skills, particularly powerful questioning and self-restraint. The power of research coaching derives from its capacity to draw out the coachee's honesty, creativity and self-motivation, under the agency of a coach with credibility as a research expert. A powerful future development in HEIs might be the provision of research coaching training for senior staff, as a means of bolstering and energising prevalent approaches to mentoring.

## 6. TOWARDS AN AGENDA FOR ACCELERATING THE DEVELOPMENT OF EXPERTISE

### *HEI Strategy*

We have discussed our concern that much research capacity-building provision focuses on discrete training associated with the 'practical information' and 'skills' aspects of learning support (Figure 1). HEIs might seek to upgrade the quality of their provision – and so the research environment – by seeking ways better to support researchers in diagnosing their learning needs, developing a critical understanding of the potential of enhancing their knowledge and skills, and integrating new knowledge with old.

One focus might be to create more opportunities for researchers from different disciplines to work together on real research problems, to promote both integrative skills and a version of interactional expertise suitable for transferring to other conversations and projects. Another might be to offer all academics opportunities to develop pedagogic expertise, research coaching skills and, at senior level, relevant managerial expertise. A third might be to make better use of HEIs' own

expert researchers, by providing more opportunities to learn about the *processes* of running major research projects, operating with complex ideas and working effectively across discipline boundaries.

### *Government Policy*

It is in the interest of government ministers to orientate social science capacity-building policy more towards maximising the potential for developing expertise in today's and tomorrow's researchers. Fact-finding initiatives could drive this – for example establishing the range of good and innovative expertise-acceleration practice elsewhere, and ascertaining the impact that social science expertise currently has, and could have, in addressing pressing economic and societal concerns.

Government and its agencies could raise the profile of developing expertise by recognising the investment value (rather than only the cost) of building learning support more formally into existing funded activities. Take research grants. Not only employed research officers, but also the wider body of junior academic colleagues stand to benefit from opportunities to use the project as an impetus for learning in pursuit of their own expertise. We noted earlier the developmental benefits for colleagues as research team members if principal investigators proactively support their learning (Fowler *et al.*, 2008), and the AERS approach towards the mentoring of relatively novice researchers involved in collaborative projects.

Learned societies in the social science community (such as the Academy for Social Sciences, and the British Educational Research Association) might develop new practical initiatives that respond to one or more aspects of the identified need in learning support. Possibilities include creating training opportunities that exploit the expertise of their membership, and offering targeted mentoring (especially around diagnosis, critical understanding or integration) to junior members of their community.

### *Research*

Social science research capacity-building policy and practice would benefit from a stronger evidence base relating to the development of expertise, taking account of the diversity in career experiences within and between social science disciplines and fields of enquiry. Research could deepen our understanding of different trajectories along which social science research expertise develops, including the associated pedagogic capabilities required for effective mentoring. For instance, retrospective accounts from experts in different social science disciplines, and from interdisciplinary experts, about how they learned their craft, could be a starting point for understanding both the processes and – more directly – how experts perceive them.

Complementary longitudinal studies over several years might track how different populations of researchers develop their expertise, including the impact of particular interventions. They could simultaneously identify significant barriers to

expertise development and the extent to which they are overcome. A third focus for research could be exploring how different facets of expertise develop through incidental learning, and which are amenable to acceleration efforts. Research into the effective use of research coaching could also be highly informative.

Overall, social science research capacity-building has considerable scope for attending more comprehensively to the transition towards expert status. Since education is a field of enquiry centrally concerned with learning, and already has an extensive record of capacity building innovation, it has much to offer in supporting the development of the new practices, research and policymaking required to make this shift happen.

## 7. NOTE

- <sup>1</sup> The authors wrote this paper in their personal capacity, and the views expressed do not represent the views of the ESRC. The helpful comments of two anonymous reviewers for this journal are gratefully acknowledged.

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