DEVELOPING SOCIAL SCIENCE RESEARCH EXPERTISE

A resource and guide for trainers

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Training materials developed at Cardiff University, as part of a project funded by the Economic and Social Research Council through its Researcher Development Initiative (Project ref: RES-046-25-0021).

Version: 27/03/14

These materials and accompanying adaptable slides and handouts can be downloaded from http://www.restore.ac.uk/researchexpertise/

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Disclaimer

Contents

1 Trainers' guide: Introduction

'The single most consistent catalyst to developing expertise that was mentioned by the informants was the research environment' (Section 6)

The purpose of this guide

This guide offers some information, suggested methods and rationales for supporting mid-career university academics in developing their full potential as social science researchers. It is the product of an ESRC Researcher Development Initiative grant (2010-14) held by the authors, at Cardiff University, UK. The project's aim was to establish how social scientists in mid-career (c.10-20 years in an academic post) could be supported in accelerating their development of the expertise—including expert thinking skills—that internationally renowned social scientists possess. A review of expertise research literature, coupled with a small-scale empirical study establishing what such international experts know how to do and how they learned it, informed the design of a set of training materials. These materials were piloted in workshops, to find out which aspects of social science research expertise mid-career researchers identified as lacking in their own profile, and to experiment with simple interventions that might support the development of missing skills. For more detail of the project, see Section 6.

Due to its focus and resourcing, the project had inherent limitations, including the absence of any capacity to track researchers' long-term trajectory or to follow up systematically on the effect of the training pilots. Accordingly, the workshops were designed to be free-standing, as a brief intervention to stimulate reflection and action, but with the potential to be lasting and to be a catalyst for further change. The piloting experience reinforced the research finding that the majority of the knowledge, skills and insights that expert social science researchers display have been learned over the course of a career. Thus it can be inferred that mid-career researchers are on a trajectory with at least some scope for developing greater research expertise. It is also reasonable to assume that researchers on that trajectory might be assisted in trying to accelerate their expert development through an intervention that mimics aspects of the formative influences reported by those already acknowledged as international experts. The materials in this booklet are the draft for a web-based version of the resource, which will include downloadable files to facilitate customization (see Section 10).

No 'one-off' workshop can substitute for learning through the career-long accumulation of experience. But workshops can be powerful means of raising participants' awareness of what there is to be learned, how to put themselves in the path of learning opportunities, and how to interpret and develop strategies for coping with their own misgivings, lack of confidence, or loss of momentum in the context of their long-term learning.

1.1 Core considerations for trainers

These materials offer a research-informed basis for developing training within your context. They are intended for use by experienced academic social scientists responsible for supporting the ongoing development, as researchers, of mid-career colleagues in their own institution, or elsewhere (e.g. as a trainer for a learned society).

We strongly recommend that this training is *delivered by senior staff who are themselves well-advanced along the trajectory from novice to expert researcher*.

From our experience, it is crucial that trainers have credibility with mid-career researchers as successful, experienced researchers in their own right. You must be able to show first-hand sensitivity to what it is like to be a mid-career researcher trying to maintain a research trajectory in the face of other demands. And you need to frame the training opportunity as entirely developmental in spirit, *not* remedial. In these ways you can create maximally favourable conditions for participants to engage whole-heartedly in the training, and to sustain their refocused efforts afterwards.

It is salutary to be aware, from the outset, that providing training for mid-career researchers is as far from straightforward as it is potentially rewarding for all involved.

First, there is greater diversity of needs and experiences by mid-career than at the early career stage. Second, there may be a wider set of possible goals—even within the context of developing towards expertise. Each researcher comes with a unique blend of knowledge, skills, experiences, aspirations, obligations, and targets. Third, the contexts in which researchers operate are differentially affected by the configuration of their other work responsibilities (including the amount and type of teaching, administrative roles), their home and family responsibilities, and their social science discipline. During the project we experimented with single-discipline (across institutions) and multi-discipline (within institutions) workshops, to gauge the opportunities and challenges of each (Section 5). It became clear that the expectations and assumptions of, and constraints on, mid-career academic researchers vary between social science disciplines. Significant differences range from the amount of available resources, through the importance attached to securing external research funding, to the nature of the activities and personnel within the local research environment.

Fourth, issues around research activity and outputs can become personally sensitive by mid-career. Other demands often contribute to a perceived shortfall in achievement, compared with early career aspirations. This can interact with the long tradition of academic autonomy, which extends to the assumption that individuals are entitled to a high degree of self-determination over their development. As a result, the vulnerabilities generated by discussing any shortfall in the development of research expertise by mid-career, coupled with the possible sense that addressing them is a patronizing intrusion into an individual's domain of autonomy, may create fertile conditions for resistance,

even hostility. There is potential loss of face in even being invited to participate in training, if it is viewed as remedial rather than as an opportunity afforded to the most promising researchers. And even where participants have voluntarily signed-up for training, resistance can arise if individual expectations are not met in the activities. For example, individuals may become concerned, once starting to talk about their research ideas, that other participants will 'poach' their intellectual property.

For all these reasons, we recommend that you try to pre-empt and remain alert to the negative affective factors that could influence take-up and the atmosphere that emerges during the training itself. (Section 2 considers in more detail how make the training work for mid-career researchers.)

For such training to stand a good chance of success, the *overarching principle must be to establish and work to maintain conducive conditions for productive individual and collective learning*. One key for promoting a positive atmosphere is to establish and actively sustain *ground-rules* which set the necessary tone of mutual respect and confidentiality. Our pilot work suggests that it is worth drawing attention to the following ethical ground-rules, in the spirit of the 'Chatham House rule' for encouraging disclosure by protecting anonymity:

Ethical ground-rules

- Sharing work experiences, aspirations and feelings may touch on sensitive information…
- …but candour within a respectful, supportive, confidential context is a great facilitator of learning.

So in this workshop, please commit yourself to following these 'Chatham House' rules:

- speak openly
- listen well
- take away ideas…
- but respect others' intellectual property
- and respect confidentiality

However, where participants already know each other, they may be particularly wary of revealing information that could help their learning. In order to address this issue:

- Consider the feasibility of avoiding people who know each other sitting on the same table
- Consider the option of presenting the workshop to mixed groups within your institution, to minimize the number of people who know each other.

In recognition that these options may not always be possible or appropriate, we recommend that the most searching exercises are kept private to the individual. (Section

9 suggests exercises for self-reflection, and we suggest that there is no requirement on the part of participants to share what they have written on the form with others.)

1.2 The materials in this booklet

To support you in developing bespoke training for your context, the materials in the remaining Sections are divided into two parts.

First, training design (Sections 2-5):

2. Considerations to bear in mind when developing a specific intervention, so as to maximize its perceived relevance for participants while minimizing potential distractions
3. Our suggested format and content for a four-session one-day workshop (the duration we recommend for the extent of its coverage), and for shorter versions
4. Ideas for extending support for mid-career researchers beyond the event itself
5. A short account of some observed differences between two indicative social science disciplines (Business and Management, Applied Linguistics) relating to the nature of research expertise and expectations of expert researchers. This discussion offers a stimulus for considering characteristics of other social sciences and how they might affect the content of training.

Second, training resources of two kinds (Sections 6-10). Research evidence:

6. A summary of the research literature and empirical evidence-base underpinning the workshop ideas and sample materials, designed for flexible and adaptive use
7. Derived from this evidence-base, quotes on the nature of research expertise, to be drawn upon selectively for training inputs
8. Another set of quotes, for the same purpose, on the learning of expertise and how its development may be accelerated.

Sample materials:

9. Ideas for workshop activities, including alternatives for single- or multi-disciplinary groups
10. Information on how to request the electronic files for a readily adaptable sample set of workshop slides and a handout for the recommended four-session, one-day workshop.

1.3 Making the materials your own

There are various ways in which you may wish to adapt or extend the materials for your context. Some are outlined in Section 5, where we consider whether participants from all

disciplines, and all mixed discipline groups, can be expected to respond similarly to the materials.

Another possibility for adding value to the materials, however, is to gather information of your own that is relevant to the target discipline group or the institutional context, as appropriate. By interviewing or emailing questions to selected nationally or internationally acknowledged researchers in the relevant discipline, or to the most expert of the social science researchers in your own institution, you can gather insights that relate as directly as possible to your audience. We suggest the following questions as potential prompts (derived from our own research prompts):

1. What are the main features of research expertise in your discipline? Give an example of someone you consider to possess extensive research expertise. What is it you see in their practice, manner or achievements?
2. How does an expert researcher think about a question or problem, compared with a non-expert researcher?
3. How did you develop your own current level of research expertise? Would you attribute any of it to training? Mentoring? Experience? Explain how.
4. What are the main differences between how you approach your research now, compared with when you started out (e.g. immediately after completing your PhD?).

We found that, by following normal ethical procedures including the guarantee of anonymity when using direct quotes for training purposes, our informants were comfortable speaking about their failures as well as their successes, and that this element was important for those participating in workshops.

An alternative approach could be to generate vignettes as stimuli for discussion. They might consist of brief personal accounts from one or two leading researchers with relevant expertise, about their journey from novice to the level of expertise they have now acquired.

2 Design considerations

Introducing the training material to mid-career researchers

We have already noted the central importance for trainers of being sensitive to the perspectives and concerns of participants. There are many reasons why researchers may need support in mid-career. Some have had to stop their research and wish to restart. Others, particularly those coming from another career, may have less research experience than their contemporaries. Others will be on a straight trajectory, but progressing more slowly than they had expected. The aim of our approach is empowerment: to provide a stimulus and support for participants in reviewing and re-energizing their further development, treating them as already-competent researchers. Such sensitivity extends to presenting the input and structured opportunities for reviewing and refocusing in a way that participants perceive as realistic, not simplistic. Thus it is vital explicitly to:

- Underscore the *facilitative* purpose of activities (participants are in sole charge of their own engagement and learning)
- Acknowledge the force of *inhibitory factors* (for example, participants are very likely to have multiple non-research responsibilities)
- Point out the *limitations* of the research informing the ideas presented in the inputs (the ideas do have empirical backing, but cannot be fully authoritative for participants' individual circumstances. It is for them to judge what practical implications there may be for them).

The opportunity to review and refocus may equally present participants with uncomfortable realizations. They are being invited to reflect on their own practices and assumptions, and recognize where they are missing opportunities that, despite the many obstacles, are within their reach. They may also be assisted towards accepting aspects of their working context and their achievements that they are unlikely to change, as the precursor to setting their sights on targets that are not beyond hope. These are challenging undertakings, and they may provoke some resistance: it may be easier to argue that the input is faulty than to focus on what the input—faulty or not—reveals and suggests.

Accordingly, this section explores why there are limits to the generalizability of the material, and suggests ways of transcending them in order to achieve appropriate goals from the training event.

2.1 Disparities in discipline, outlook and setting

The research underpinning these materials was small-scale and did not survey the majority of social science disciplines. In addition, as no literature was found on the nature of social science research expertise, the net was cast wider, to review research literature on expertise more generally. It is therefore very possible that particular quotes provided here are not fully applicable to everyone participating in a training event.

However, these limitations epitomize the general lack of knowledge in this area, not just *our* knowledge. The research training project enabled us to make a very modest contribution to an underdeveloped domain of enquiry.

In Section 5, we examine the question of how similar the social science disciplines are. Some observations are presented about contrasts between the two disciplines we focused on (Business and Management, Applied Linguistics). Possibly wider patterns are considered, and why they might be hypothesized. Suggestions are made about how the facts might be supplemented, to maximize their relevance for a given training cohort.

In Section 7, we discuss the extent to which expertise as a concept can be reliably transferred across domains, and propose that in many regards it cannot. We suggest ways in which you can turn to advantage in your training input the tendency for research into generic expertise to overlook the contingent nature of expertise in social science research.

Below are some observations that you may be able to use in your training to acknowledge and work with the possibility of differences between disciplines, outlooks and work settings. There may be multiple reasons why an individual does not agree with claims made by others.

The limitations of the generic research into expertise

- *What you find out depends on where you look.* Most expertise research comes from the field of cognitive psychology. It tends to emphasize individual over social characteristics, cognitive over emotional elements, and experimentally controllable proxies for variables of interest, over their 'natural' occurrence in the field.
- *How far you generalize depends on:*
  - *how much you think is shared between settings.* Most research has been carried out in domains where there is wide consensus on how to identify expertise and to measure expert performance, such as chess, sport or advanced instrumental technique in music. The generalizations tend to be presented, implicitly or explicitly, as universal. Yet none are based on research within the inherently contested domain of social science research.
  - *how much you think is shared between domains.* The core generalization that expertise is domain-specific (e.g. a chess champion will not expect to be an expert in solving crosswords) sits uneasily alongside the assumption that findings from research in one domain apply to all others. But a justification for high

generalization is that expertise in all domains reflects human biological and psychological factors, as well as cultural factors. So it may be universally applicable at a very high level of abstraction.

Generalizing from the quotes given by social science experts in this study

- In our interviews, expert researchers in the same discipline did not always agree with each other. The question of whether experts in one discipline display patterns of belief and experience that differ from experts in another discipline is an empirical one, and can be examined openly as a means of understanding better what it means to be an expert researcher in one's own social science discipline.
- Researchers from the same discipline and institution, and with the same level of seniority, may differ in their conceptualization of what it means to be an expert researcher. Even though it is likely that career stage and institution impact on one's experience and beliefs about research expertise, they may not be the determining factors in every case, and personality and personal experience probably also play a role.
- *Someone else's story is not your story.* The range of stories, attitudes, claims and beliefs indicates that there are many ways to acknowledge success. Each person will find his or her own. The information cannot prescribe paths, but rather reveals that many of the obstacles encountered by mid-career researchers have also been encountered, and overcome, by individuals recognized as field leaders.
- *What you see depends on the lens you use.* Expertise in general and expert thinking in particular are just social constructs. Since such concepts are coined to capture aspects of experience that cannot all be directly observed, they are open to multiple interpretations.

2.2 Disparities of seniority and level of achievement

The research informing these materials targeted informants at the top of the international research community in their discipline—chairs or ex-chairs of national and international associations, and people with a high level of recognition by others. Mid-career workshop participants may perceive that they do not have much in common with such informants.

However, the training events we held repeatedly generated comments from participants about the matches between their own experience and that of the expert researcher informants. Frequently identified similarities included:

- making mistakes
- being discouraged by peer review feedback, rejections of papers, and the failure to win research funding
- believing that they do not know enough, that they are working at the edge of their knowledge, and that others expect more of them in terms of knowledge and skill than they believe they have
- encountering problems when collaborating with other researchers

- difficulties with managing time and coping with multiple demands.

2.3 Can early career researchers benefit from these materials?

There is already quite widespread provision across the sector for early career researchers (ECRs), covering the period from finishing a PhD to around five years into the first research or lecturing post. But the present materials have been developed for a different group. Mid-career researchers typically differ from ECRs, having more experience of:

- research, perhaps on a larger scale than a PhD project
- responsibility for training others
- managing the balance between research, teaching and administration
- knock-backs from rejected journal article submissions and funding applications
- institutional pressure to deliver excellent research performance (e.g. in national research assessment evaluations)
- lacking time or opportunity to gain support in developing new knowledge and skills.

In our pilot workshops, we often found we had early career 'interlopers'. But their understandings about the nature of academic research were strikingly different from those of more experienced colleagues. We infer that the perceptions of academics tend to change rapidly during the first few years of a typical lecturing and research post. In a mixed group, comments from early career researchers may be treated as naive or found intimidating by mid-career staff, while the ECRs are bewildered and disconcerted by the preoccupations of mid-career researchers. For this reason, the training will work better where only mid-career researchers participate.

However, individual differences amongst mid-career researchers must also be thought about. Some highly experienced lecturers and supervisors may not have a PhD, and/or they may not be engaging in independent research. Yet it would be inappropriate to classify such people as 'early career' because their job roles present many of the same impediments to developing greater research expertise as those confronting the more typical mid-career researcher.

In deciding whom to invite to your sessions, it may be worth considering how:

- in the target disciplines, career stage and experience are likely to impact on the kinds of beliefs and assumptions that will be expressed
- in your context, differences in perception between early career sand mid-career staff would be likely to manifest, and how you might handle them—for example, vociferous or eager ECRs could undermine the atmosphere of trust, by either intimidating mid-career staff who have lost confidence in their research potential or under-acknowledging issues that have not yet developed in early career.

In sum, other forms of support may be more appropriate for early career researchers. We recommend that they are not included in workshops for mid-career colleagues. (These materials may be adaptable, in principle, for ECR workshops. But as they were not developed for that purpose, we imagine that significant re-orientation and experimentation would be required.)

2.4 Problems with the notion of 'expertise'

During a training session, it would be easy for participants to get side-tracked into dwelling on the not insignificant problems with defining expertise. However, it should be noted that in fact the construct did have strong face-validity for participants in our experience. That is, whatever research expertise is, they all seemed to hook onto something fairly solid, and sufficiently similar to not engender any obvious disagreements or misunderstandings. The notion of research expertise helped them think in terms of their overall trajectory, rather than solely in terms of disparate research and related tasks.

In preparing for your training inputs, these points might be helpful to bear in mind:

- When we asked participants to name individuals whom they considered to be expert researchers, they had little difficulty doing so. When reporting why they picked them out, there was considerable overlap between the characteristics they identified. It is true that this task may home in on a particular archetype, missing other important features. But other workshop activities contributed to developing a fuller picture of expertise. What a workshop participant instinctively identifies is likely to be a sound starting point. Once participants have surfaced some personal sense of what social science research expertise is, they are in a position to work towards the practical implications for their further development.
- A lengthy discussion problematizing the basic term may feel safer for participants than engaging with their own expertise and how to extend it. So the group may need to be coaxed into settling for a good-enough definition, as a platform for pursuing their interest in reviewing and refocusing their research efforts.

One way of acknowledging the problems with defining expertise could be to use some relevant quotes from our informants (Section 7.1).

2.5 Expertise in the context of the UK 'REF' and equivalent research evaluation exercises elsewhere.

In this project, we did not engage directly with the question of the UK REF (Research Excellence Framework 2014, and next projected for 2020)—only a third of our informants were UK-based. However, UK researchers are bound to wonder if REF emphasizes or contradicts the core features of social science research expertise as captured in this training material. The three defining characteristics of excellence for outputs in

REF2014 were Originality, Significance and Rigour, defined by the Social Sciences panel (Panel C) as follows:

> **Originality** will be understood in terms of the innovative character of the research output. Research outputs that demonstrate originality may: engage with new and/or complex problems; develop innovative research methods, methodologies and analytical techniques; provide new empirical material; and/or advance theory or the analysis of doctrine, policy or practice.
>
> **Significance** will be understood in terms of the development of the intellectual agenda of the field and may be theoretical, methodological and/or substantive. Due weight will be given to potential as well as actual significance, especially where the output is very recent.
>
> **Rigour** will be understood in terms of the intellectual precision, robustness and appropriateness of the concepts, analyses, theories and methodologies deployed within a research output. Account will be taken of such qualities as the integrity, coherence and consistency of arguments and analysis, such as the due consideration of ethical issues.

The quotes in Section 7 show how these features map fairly well onto the types of contributions that our informants considered experts to make. However, as indicated in Section 5, there may be disciplinary differences in how researchers locate different types of research on the REF continuum from 1-star to 4-star, relative to these three criteria. It has been acknowledged unofficially that certain kinds of research, however expertly carried out, may struggle to achieve four-star status, because of the nature of the knowledge hierarchy. An empirical study is competing for attention with thousands of others, whereas a new theoretical framework may gain a great deal of attention and be influential on other researchers. Not every research expert is a theoretician. Does that mean that some research experts may find their contributions given less value because of the nature of their intellectual project? The capacity of research of each type to achieve a high assessment in the REF depends on how researchers in the discipline position themselves in relation to policy and practice, on the one hand, and theory on the other. Section 5 makes one such comparison (between Business and Management and Applied Linguistics). These are issues that could be discussed in a workshop.

2.6 Maximizing the limited potential of a short intervention

We noted when setting out the purpose of this guide (Section 1) that one-off workshops cannot substitute for the gradual accumulation of research experience that is a necessary foundation of research expertise. The workshop designs to be discussed in Section 3 reflect our efforts to maximize the limited potential of such an intervention by:

- creating opportunities for reflection and planning, so as to increase the chances of participants continuing to develop themselves beyond the event itself
- minimizing the 'unreality' of simulation exercises, by using research tasks that could genuinely be further developed and undertaken
- proposing options for follow up and associated ways of creating a research environment conducive to accelerated development (Section 4).

2.7 Advertising the workshop

To convince busy people to attend a workshop you need to be clear about what it is and is not, and why participation will be beneficial to them. Just how that is done depends on the prevailing culture in the relevant institutions(s) and discipline(s). In contexts where there is already a positive attitude to learning, the main message may be that the workshop is expressly for mid-career academics, who normally don't get much support, but who have needs and priorities distinct from those of earlier and later career stages. This approach should be effective when the input is being offered across institutions, e.g. by a learned society, because, irrespective of the local situation where an individual works, they will see this opportunity as external and motivated by a positive commitment to capacity building.

Academics whose working environment tends to instil a sense that they are frequently judged on their performance, or that there is a competition for success, will need a different approach. Particularly if the invitation comes from within the institution, it may easily be construed as signalling failure or as another source of unwelcome pressure. Thus, it is important to describe the workshop as developmental, and not in any way remedial.

No doubt any academic can identify some areas in which they could benefit from a little back-up on core skills and knowledge, and these will emerge during the private reflective exercises. But the overall assumption is that the participants are capable of high performance in research, but have lacked time and opportunity to reach their potential.

The following may be useful options for wording an invitation:

- A rare opportunity for established academics, in a supportive and confidential setting, to:
    - Review your progress along the trajectory towards greater expertise as a researcher (including your role in developing other researchers)
    - Plan your strategy for continuing to enhance the development of your research expertise.

- Informed by research evidence that explored the characteristics of expert thinking and practice in social science research.

- Participants will have the opportunity to:
    - Find out what top international social science researchers reported to be the main catalysts of their learning, what they prioritise in their practice, and how they support their own students and junior colleagues
    - Discuss the issues arising in relation to developing oneself in these ways
    - Discuss the particular challenges and opportunities for researcher development in the UK context
    - Engage in activities supporting the development of particular expert thinking skills

- This workshop is for mid-career academics who have ***at least*** five years post-doctoral experience in a teaching and research post. Therefore, it is not suitable for PhD students, or early career staff. The input assumes that participants have personal experience of the pressures of multiple demands on time that typically arise from teaching, administration and research in a university.

3 Workshop designs

Introduction

There are many possibilities for creating interventions that are feasible in scope and sensitively matched to the characteristics of participants. Here, building on what we learned from piloting a particular type of intervention, we offer a few general design pointers, followed by the detailed specification for the one-day workshop format that we found worked best. We also provide ideas on how selected elements of the day could be used in shorter workshops.

3.1 Pointers for organizing training

Self-evidently, enough time must be given over to the training activities for participants both to complete a meaningful set of activities, and to become sufficiently relaxed to participate freely. Other general lessons from our experience are that:

- A relatively informal 'cabaret style' room set-up works well for both group work and plenary discussion. But it is important that the tables are not so fully populated that any individuals have to sit with their back to the screen during presentations. A group size of 5-6 people is about right for the collaborative tasks that we suggest.
- The total number of participants should ideally be between 15 and 25. Fewer may mean less potential for generating ideas and discussion. More may mean less individual attention from trainers, and feedback from groups taking overly long.
- A good quality buffet lunch gives participants chance to get to know each other better informally, and can promote interdisciplinary or inter-institutional networking. Enough time has to be allowed for this networking to take place, and participants can also be encouraged to continue their conversations after the workshop finishes.
- Where appropriate to facilitate ongoing exchange, at the end of the workshop, participants' agreement may be sought to circulate a list of names and email contact details.
- Participants may appreciate an opportunity at the beginning of a workshop to introduce themselves. This element can be kept brief if they are asked just give their name, affiliation, and area of research interest. Asking for a reason for their presence at the workshop may be counter-productive, as people may not want to disclose anxieties about their career achievements.

3.2 Recommended four-session, one-day workshop design

Having trialled different formats, we strongly recommend a one-day workshop made-up of four sessions. This format represents the best compromise we found between:

- The maximum amount of time that busy mid-career researchers are likely to give up for an optional training opportunity
- The minimum amount of time required for awareness-raising, practice and planning activities that will gear participants up for focusing and re-invigorating their efforts to develop their research expertise further.

A risk of short training activities is that they only enable participants to talk about what they need to learn, rather than engaging in the learning itself. Given how gradually expertise develops, it is unlikely that one could significantly enhance it in the space of an hour or so. But the four-session workshop can reach beyond talking about practice, giving participants at least a taster of expert thinking *in practice* through active engagement in a real research design task. This activity was well-received by our participants. It gave them direct experience of doing expert thinking, alerting them to new possibilities and styles. So while this practical session is a time-consuming element of the workshop day, our experience suggests that the workshop stands to be more effective if it is included.

There should be some form of end-of-workshop evaluation opportunity, in order to gain formative feedback on the quality and impact of the activities. How the evaluation should be done is for trainers to decide, as it will depend on the nature of the participant feedback sought.

The four sessions aim cumulatively to support participants in reviewing, reflecting, trying out an expert thinking task, and identifying the next steps for their own development:

1. Raising participants' awareness of their own degree of research expertise, the problems associated with understanding the nature of research expertise more broadly (including expert thinking), and the implications for expertise and its development of their particular disciplinary (or interdisciplinary) context
2. Raising participants' awareness of how research expertise is learned and the extent to which its development can be accelerated, and of developmental opportunities
3. Giving participants direct experience of collective research design work with a novel set of collaborators, focusing on an issue of genuine concern to them all
4. Enabling participants to draw upon their raised awareness and direct experience in working out a strategy for attempting to accelerate their own development.

A detailed outline is set out below. The timing for each session is unspecified, since there is flexibility over how long to spend on the content. But a typical timing for each of Sessions 1-3 might be 1 hour 30 minutes, and 45 minutes for Session 4.

The title of each session is indicated in the first column. The content sequence is listed in the second column, showing how the activities progressively build towards individuals' identification of their next steps.

The third column summarizes the five sources of material that we are making available within our resource for trainers to use, whether off-the-shelf or adaptively, as appropriate to the circumstances. We have made selective use of these sources for the sample slides and handout, designed for a generic, multidisciplinary workshop (see Section 10 for how to request the electronic files). To facilitate flexible use for bespoke workshops in different situations, we have provided a much wider range of material within the secondary and primary data sources in Sections 7 and 8 than a single workshop would employ.

Four-session, one-day workshop design (e.g. 10.00-16.30)

Session number and title	**Sequence of content**	**Sources of material available within this resource** (the section number for each source is given in brackets)				
		Slides (10)	*Exercise (9,10)*	*Secondary data - generic expertise literature (7,8)*	*Primary data - social science 'experts' (7,8)*	*Analysis of primary data (5)*
1. The problematic nature of research expertise, including expert thinking	• Aims, intended outcomes, ground rules • Taking stock – individual review • What expertise is, including thinking, relevance of disciplinary context • Discussion	✓ ✓ ✓ ✓	Ex 1	Caveats, expertise, thinking	Expertise, thinking	Compari-son
2. Learning research expertise; scope for accelerating its development	• Learning expertise, accelerating expert development • Taking stock – opportunities for development • Discussion of possibilities in participants' setting	✓ ✓ ✓	Ex 2	Learning, acceleration	Learning, acceleration	
3. Expert thinking in practice	• Collaborative research design • Report back, discussion	✓ ✓	Group task	Interactional expertise	Collaboration	
4. Implica-tions for personal strategies	• Tips from 'experts' • Support possibilities • Planning a personal strategy • Sharing ideas • Evaluation	✓ ✓ ✓ ✓ x	Ex 3		Accelerating development	

3.2 Shorter workshop designs

It is not always possible to devote a full day to a workshop, so we suggest how the four-session design above can be reduced to three or even two. In each case, some of the impact potential of the longer workshop is inevitably lost. Thus a three-session, half-day workshop might be created by omitting the collaborative research design task, retaining all the other content. A two-session morning, middle-of-day or afternoon workshop might be created by omitting this task and also collapsing the first two sessions into one by omitting some of their content. These alternatives are set out below.

Three-session, half-day workshop design (e.g. 11.00-15.30)

Session number and title	**Sequence of content**	**Sources of material available within this resource** (the section number for each source is given in brackets)				
		Slides (10)	*Exercise (9,10)*	*Secondary data - generic expertise literature (7,8)*	*Primary data - social science 'experts' (7,8)*	*Analysis of primary data (5)*
1. The problematic nature of research expertise, including expert thinking	• Aims, intended outcomes, ground rules • Taking stock – individual review • What expertise is including thinking, relevance of disciplinary context • Discussion	✓ ✓ ✓ ✓	Ex 1	Caveats, expertise, thinking	Expertise, thinking	Compari-son
2. Learning research expertise and scope for accelerating development	• Learning expertise, accelerating expert development • Taking stock – opportunities for development • Discussion of possibilities in participants' setting	✓ ✓ ✓	Ex 2	Learning, acceleration	Learning, acceleration	
3. Implica-tions for personal strategies	• Tips from 'experts' • Support possibilities • Planning a personal strategy • Sharing ideas • Evaluation	✓ ✓ ✓ ✓ x	Ex 3		Accelerating development	

Two-session (morning, middle-of-day or afternoon) workshop design

Session number and title	**Sequence of content**	**Sources of material available within this resource** (the section number for each source is given in brackets)				
		Slides (10)	*Exercise (9,10)*	*Secondary data - generic expertise literature (7,8)*	*Primary data - social science 'experts' (7,8)*	*Analysis of primary data (5)*
1. The problematic nature of research expertise, how it is learned and scope for accelerating development	• Aims, intended outcomes, ground rules • Taking stock – individual review • What expertise is, relevance of disciplinary context • Learning expertise, accelerating expert development • Discussion of possibilities in participants' setting	✓ ✓ ✓ ✓ ✓	Ex 1	Caveats, expertise Learning, acceleration	Expertise Learning, acceleration	Compari-son
2. Implica-tions for personal strategies	• Tips from 'experts' • Support possibilities • Planning a personal strategy • Sharing ideas • Evaluation	✓ ✓ ✓ ✓ x	Ex 3		Accelerating development	

Both alternatives clearly offer a more superficial review and planning experience than the recommended one-day workshop. But participant feedback in our trialling of these formats indicated that they can still give participants a highly valued opportunity to take stock and rethink their developmental trajectory as researchers. Since the sessions retained are the same or shortened versions of their counterparts in the four session workshop, the same sources of material can be drawn upon for off-the-shelf or adaptive use.

4 Supported follow-up

Our research confirmed that expert development can be accelerated to a moderate degree through a constant endeavour, sustained over years, to extend one's capability. But there are no short-cuts to expertise. So, as noted in Section 2.6, a single workshop cannot be expected to operate as more than a catalyst for participants, empowering them to harness what is known about expert development and speed up their further development. Supported follow-up can help to maximize the positive legacy of such a workshop by encouraging participants to maintain their new momentum, stay in touch with each other where mutually beneficial, and progress through further cycles of reviewing and refocusing as future opportunities and difficulties arise.

A major insight shared by our research informants was that doing leading-edge research is inherently challenging right through the career. So it is to be expected that participants will appreciate ongoing support, especially in current academic environments, which are often very challenging to work in. Participants in our workshops widely acknowledged that it is difficult to sustain the level and quality of research that most academics entered the profession expecting to achieve.

Therefore, it is appropriate to consider ways in which participants might not only help themselves but also gain practical support from their institution and learned society. This section briefly lists ideas for creating and sustaining a positive research environment for mid-career staff. It is in the interests of academia to enable this to happen: institutional research reputation depends on the capacity to facilitate and enhance high quality research activity. It is equally important for learned societies to support their members in developing an excellent international research profile for the discipline.

4.1 Direct follow up from the workshop

Participants will depart from a successful workshop with enthusiasm and with ideas about how to make material changes to their research activity that are capable of accelerating their development towards a higher level of expertise. There are opportunities for you as the trainer to provide follow-up support. This might include:

- Seeking permission from participants to circulate an email list of attendees and inviting them to contact anyone they would like to collaborate with
- Encouraging them to take forward any promising project ideas developed during the collaborative group task. Here, they might want to liaise with others in their group, to ensure they don't develop in parallel something that could be undertaken collaboratively
- Emailing participants a few weeks after the workshop to remind them of key messages and suggest they review and update their personal strategy

- Sending them information, where appropriate, about any events relevant to their development that are being organized within your institution or learned society.

4.2 Things individuals can do for themselves

The 'top tips' list (see Section 9.3.2) is a useful catalyst for individuals to identify ways of helping themselves. Below are ideas addressed to participants that could be offered during or after the workshop:

- Make an inventory of the different types of task you have to address in the course of a working year, and consider how linking them creatively could generate opportunities for developing your research. Could any of these possibilities work for you?
  - When at a university event with other academics, make a deliberate effort to ask others about the research they do and try to identify foci of interest that overlap with yours, including indirect ones. Carry a means of jotting down email addresses, and arrange to have lunch with people whose work interests you.
  - Use opportunities in administrative roles to enhance your, and others', research environment. For example, when inviting visiting speakers, ask them to spend an additional hour in conversation with staff, so as to increase the amount of information-sharing, and build up ideas and opportunities for collaboration. When setting up administrative meetings, build in time for colleagues also to discuss what they are currently working on in their research.
  - Set up an electronic or physical notice board for you and colleagues to post up abstracts of recently published papers and forthcoming conference presentations, and encourage discussion around them.
  - Take advantage of PhD supervision and teaching opportunities to set students tasks relevant to your own learning, such as data collection, literature reviews, and discussions of papers that you need to be thinking about.
- Undertake to read one paper per year by one or more of your colleagues, as this will raise your awareness of close-at-hand knowledge and skills available to you
- Seek out a mentor or coach—ask your institution to help you
- Apply for a fellowship or exchange that will allow you to spend some time in another research environment
- Join the mailing list of other departments and nearby universities with relevant research communities and attend their guest lectures and other events
- Be a supportive and engaged member of your community—build up trust with colleagues by listening to their ideas and sharing your own
- Join an interdisciplinary network and use it to engage in new conversations
- Log the impact of different work activities that you have to do (e.g. your email traffic), and develop strategies for managing them differently
- Learn to recognize the signs of procrastination and address them positively
- Be ambitious, but realistic. If you have more research ideas than time, be generous with them, and then take an interest in those who develop these ideas.

4.3 Ideas for institutional support

The provision of a research environment capable of enabling researchers to produce their highest quality research in sufficient quantity is likely to be a priority for any higher education institution. While there will be financial constraints and competing priorities, it is important for institutional leaders to keep in mind that most academics entered the profession as a result of their engagement with research. The more that can be done explicitly to acknowledge this commitment and underlying priority amongst staff, the more it should be possible to support colleagues in navigating and combining the many different demands on them.

Creating and sustaining a positive research environment entails commitments at the highest level to putting in place a suite of complementary support mechanisms. Ideas for doing this, addressed to pro-vice chancellors, deans and research directors, include the following:

- Provide practical training in presenting one's research, using new media, etc., as a way of increasing researchers' confidence
- Set up a high quality mentoring scheme, which entails training for both mentors and mentees about how to use the relationship effectively
- Encourage peers to help each other through informal 'buddying' arrangements
- Instigate a scheme whereby research directors read at least one paper (published or in draft) by each of the colleagues for whom they have responsibility. They might be asked to present a short overview once a year of the research that has been done in their unit. In large units, research directors can cascade some of the work to others, thus developing research leadership capacity. The aim is to generate enough awareness of each other's research to foster mutual support
- Create mechanisms for providing early developmental feedback on papers and funding bids (preferably acknowledging the time this takes in workload allocations), and encourage those charged with this task to see its value in also helping them think creatively about their own research
- Hold writing retreats away from the institution
- Have a team who can help staff recycle unsuccessful bids and papers
- Foster networking (e.g. by funding lunches, brokering one to one introductions)
- Provide 'seed-corn' funding to facilitate creative exploratory projects
- Manage the parameters of teaching and administration to enable colleagues to clear short periods for intensive study or writing (e.g. by juggling their timetables, swapping classes with colleagues, or giving PhD students the chance to deliver lectures)
- Enable all staff to have at least one day per week that is free of teaching and meetings
- Employ postgraduates to support teaching and administration and/or create postdoctoral fellowships for the purpose

- Encourage and support colleagues in applying for opportunities to benefit from time in another good research environment (e.g. staff fellowships and exchanges to other institutions, an intensive stay in an international academic study centre)
- Clarify the expectations on academic staff, to help them avoid over-preparing their teaching, putting too much time into marking, or attending unnecessary meetings
- Provide guidance on which types of research activity are most worth putting time into and why, and advise colleagues to make strategic decisions (e.g. around the pros and cons of write book reviews, overview articles)
- Develop ways to help staff manage email traffic, such as:
  - ensuring you have the best software for the job
  - experimenting with 'email-free' working days or afternoons
  - requesting that emails are not sent during weekends
  - ensuring that administrative staff are aware of the rhythm of the academic year in setting deadlines
- Formally recognize the non-teaching parts of the academic year as research time and leave time, so that administration and teaching responsibilities are contained within only certain weeks of the year.

4.4 Ideas for learned society support

Learned societies are uniquely placed to provide their members with elements of a rich research that complement those available within institutions—whether through conferences, special interest groups, bespoke events, networks or funding. Ideas, addressed to learned society representatives with a developmental role or interest, span:

- Teach-ins on new theories, methods and techniques, or stock-taking events for fields within the discipline, attached to the annual conference
- Mentoring and coaching schemes
- Training events (e.g. on how to publicize one's research through the mass media)
- Networking events to encourage collaboration
- Commissioned research support materials
- Events aimed at working together to ensure the discipline thrives (e.g. exploring the reasons why peers are giving low scores to funding proposals)
- Special issues in the society's journal focussed on topics or approaches that will encourage the development of disciplinary research capacity
- Awards that can motivate and reward mid-career members' research and related efforts (e.g. best paper, reviewer of the year for the learned society's journal)
- Funding to stimulate research (e.g. pump-priming projects, new research networks; research seminars competition; public engagement or impact scheme; bringing in expert researchers who can advise or train members)

4.5 Working together

The scope for collaboration between HEIs, between learned societies, and between HEIs and learned societies was explored at a one-day conference in January 2014, as which this booklet was also disseminated in draft. The participants were those within HEIs responsible for the support of mid-career social science researchers (e.g. directors and deans of research) and members of the executive committees of social science learned societies. Key ideas emerging from the day were:

- Despite the challenges of competition, institutions may benefit from collaborating with other HEIs or with learned societies in at least the following cases:
    - Too little capacity within the institution to provide all of the necessary support (e.g. mentoring and coaching)
    - A perceived agenda amongst staff in the institution associated with remediation, that can be overcome by using academics from elsewhere to do the training, or by mixing staff from more than one institution
    - An interest in discipline-specific support, that requires a larger number of participants
    - Support that will be more cost-effectively provided through collaboration
    - Combining support with other provision such as inter-institutional networking.

- Learned societies may benefit from collaboration with each other, in:
    - Sharing good practice and supporting each other to develop new initiatives
    - Sharing events such as funding workshops, writing retreats, etc, including ones with an interdisciplinary topic of mutual interest.

- Learned societies may be able to help address institutional needs while generating revenue, by building a team of members with a specialism that can be offered to their own or other social science disciplines, e.g.
    - Training or support in skills and knowledge that are well-represented in that discipline but limited in others, such as statistical methods, discourse analysis, ethnographic methods
    - Mentoring
    - Grant proposal writing
    - Developing impact from research
    - Aspects of academic leadership
    - Engagement
    - Report-writing.

5 Disciplinary differences

As a trainer you may be from a discipline that is not represented in our scoping study, or your workshop participants may have diverse disciplinary affiliations. The social sciences cover many disciplines: the ESRC's website lists 19, organized under nine headings:

- Demography and Social Statistics, Methods and Computing
- Development Studies, Human Geography and Environmental Planning
- Economics, Management and Business Studies
- Education, Social Anthropology, and Linguistics
- Law, Economic and Social History
- Politics and International Relations
- Psychology and Sociology
- Science and Technology Studies
- Social Policy and Social Work

Our experience with single and multidisciplinary groups indicates that there are significant differences, and participants generally expect training to be consistent with the characteristics of their discipline. Here we review issues that might arise, and suggest ways of dealing with them.

5.1 Case study: Business and Management *versus* Applied Linguistics

For practical reasons, in the research for this project we collected data from just two disciplines. Only three of our 31 informants were from social science subjects outside the two domains of Business and Management or Applied Linguistics. We selected these two disciplines because of our own research specialisms, and because, between them, they represent a number of features that characterize the broader set of social science research disciplines.

Dominant theoretical orientation

- Business and Management typically draws on sociological theory to inform practice in public, private and third sector organizations
- Applied Linguistics includes a strong element of educational and learning theory, applied to language learning and teaching
- However, neither discipline is restricted only to these domains, nor to applied topics

Provenance

- Business and Management researchers may have begun life in business, but most of those at the top of the profession are likely to have spent their whole career in academia. Despite drawing heavily on core social science texts and concepts, Business

and Management is viewed as a distinct discipline in its own right, with its own traditions and assumptions.
- Many Applied Linguistics researchers began as language teachers (most commonly of English as a foreign or second language). Of those without such a background, most studied linguistics or language studies at university before specializing in the applied side. Theoretical and descriptive linguistics, which underpin the expertise of many applied linguists, are categorized as Humanities subjects.

Dominant philosophical orientations

- Our perception is that the bulk of research in Business and Management tends towards a positivist stance—adducing knowledge from tangible evidence, and interpreting it in accordance with assumptions about consistency and reliability in externally measured phenomena.
- In Applied Linguistics, research into language teaching often has a similar stance. However, an extra dimension to language research is that language itself has a character and shape that is not entirely predictable. In linguistic research, language often has to be viewed as a variable in its own right, in a way that the organizations researched in Business and Management are not. (Of course, in both disciplines individual human differences are also a variable). The sometimes mysterious nature of language, along with the pull on Applied Linguistics of the Humanities-facing activities of descriptive and theoretical linguistics, generally tend to weaken positivism and create a more pluralistic approach to understanding language-related topics.

Dominance within the international research community

- Business and Management research is heavily dominated by North American work. The majority of prestigious, A-list journals are US-based. Inevitably, the styles and approaches of these journals influence the kind of research that is done and reported.
- In Applied Linguistics, there is a broader base of expertise, spread across all continents and, increasingly, engaging with diverse languages. The journals cover different topic areas, dissipating the capacity for any one journal to dominate in terms of high prestige irrespective of the research topic. Most notably, on many impact factor lists, the top scoring 'Applied Linguistics' journals are in fact Psychology journals.

These considerations may jointly account for some of patterns, outlined below and illustrated in Sections 7 and 8, that we found in our data. However, our sample was too small to make strong claims about these differences, and they are noted simply as pointers.

1. Tacit knowledge

While several Business and Management informants considered research expertise to be partly tacit—that is, some of the things an expert researcher knows how to do cannot be verbalized—no Applied Linguists expressed this view.

2. Communication
Many Applied Linguists, but only a few Business and Management researchers identified the capacity to communicate ideas clearly as a central skill of the expert.

3. Breadth of skills
Most Applied Linguists considered that a research expert should be capable of using more than one approach, and should be ready to apply the most appropriate method for the particular research question. Although Business and Management researchers also recognized the need to be flexible with methods, they were more likely to identify types of expert researcher who adopted a preferred method or style.

4. Breadth of knowledge
Almost all experts in both disciplines believed that research experts should have broad subject knowledge. However, some Applied Linguists, talking about themselves, said that they tended to operate at the extreme edge of that knowledge. Only one Business and Management researcher made the same self-observation.

5. Goals
Business and Management researchers were more likely than Applied Linguistics researchers to define expertise in terms of achieving key career goals (e.g. awards, publications in key journals, research funding). They were also more likely to view expert researchers as those who identified knowledge gaps, while the Applied Linguists focused more on experts' capacity to answer significant questions that could engender change in practices.

6. Recognition
There was broad agreement that expertise is something that others see in a researcher—an expert who is not recognized as one is, in some respects, thereby not an expert. For Business and Management researchers, an expert researcher was someone who had made an impression within the research community. The Applied Linguists were more likely to conceptualize the expert researcher as a person who was accepted and respected by the research community.

Commentary
The differences in 1 and 2 above could reflect the stronger link in Applied Linguistics to teaching and learning, where explicit attention is paid to the nature of skills and how they develop. Even though not all Applied Linguists come from a language teaching background, or specifically research language learning and teaching questions, there may be a general influence on the community of practice, creating a culture of expectation around explicitness and clarity.

The contrasts in 5 and 6 could reflect a sense of competition within the Business and Management research community, deriving from a relatively well-defined set of markers of excellence (including the definitions adhered to by the A-list journals). In contrast, Applied Linguistics is more pluralistic, both in terms of international research contexts and in combining social science approaches with insights from Humanities-facing

descriptive and theoretical linguistics. This same pluralism, may, as suggested in 3, be expressed as ambivalence about the effectiveness of any method in the absence of others, doubts amongst expert researchers about how much they feel they really know (4), and a need to obtain acceptance by the community (6). Achieving such acceptance would entail clear communication (2) and demonstrable benefits of the research (5).

It was certainly our distinct impression that, collectively, the Business and Management expert researchers displayed different attitudes towards their activities, themselves and their colleagues compared with their Applied Linguistics counterparts.

5.2 Harnessing differences for discussion

The contrasts outlined in 5.1 may not be generalizable even within the two populations primarily represented in our study. But they do illustrate how a possible array of rather subtle differences between researchers within the social sciences might create difficulties with deploying these materials in your own training situation.

If you are working with mid-career researchers from your discipline you may well have a sense of how representative our findings from Business and Management and from Applied Linguistics are, and whether they rings true for your own context as well. If so, you will be in a good position to judge whether and how to take into account any factors we identified.

If you have time for the investment, you could pose some of the core questions from this study to expert researchers in your own discipline (see section 3.1). Alternatively, if you are training researchers from different social science backgrounds, you could ask them before or during the workshop to answer the following questions, and then explore the similarities and differences.

1. How would you characterize different aspects of research expertise in [your discipline]? What makes someone stand out as an expert? What makes them different from non-experts? Do all experts have the same characteristics?
2. Could you describe up to three examples of researchers whom you consider to have great expertise? In each case, what is it that marks them out as an expert researcher?

The aim is less to establish discipline-related differences than to assist participants with clarifying what expertise means for them, and what aspects of their own research expertise they aspire to develop further.

Discussing perceptions of what an expert is, whether using the contrasts directly revealed in the group or comparing a single discipline group with the features given above, will assist participants in recognizing that they need to be alert and discerning if they are successfully to navigate others' tacit expectations or assumptions.

TRAINING RESOURCES

Research Evidence

6 The evidence-base

The development and piloting of training activities, culminating in the present resources, were underpinned by our literature review and the modest empirical study.

6.1 The literature review

The aim of the literature review was to establish the extent to which social science research expertise could be understood within a broader frame. The review focused on the generic definitions of expertise and their provenance. The review is represented in these materials in the form of quotes that support indicative elements of the training trajectory. The quotes are presented in Sections 7 and 8. The main review questions were:

1. How is expertise defined and characterized generically?
2. What sort of evidence underpins these definitions and characterizations?

A subsequent question was addressed through a critical analysis of the findings:

3. To what extent is it possible and appropriate to apply the generic claims about expertise to the specific context of social science research expertise?

Our answer to question 3 was that it is not always possible to do so. In Sections 7 and 8, we offer commentaries that address the gap between the generic expertise research and the nature of social science research expertise.

6.2 The empirical study

The empirical data were from face to face and electronic interviews with 31 'expert' researchers, mostly in Business and Management and Applied Linguistics, supplemented by interviews with three informants from other social science disciplines. The sample selection was driven by twin concerns: to gain insights that the training materials could

draw upon directly (hence approaching experienced researchers who were acknowledged to be successful); and to assess the importance of disciplinary differences, by concentrating on just two contrasting disciplines. Despite the demonstrable limitations of the sample, these materials are fit for their purpose, in informing and providing some grounded content for the training workshops.

We operationally defined 'expert researchers' as individuals who currently carried, or previously had carried, prestigious positions in their discipline (e.g. president or chair of a major learned society; editor of a top journal; plenary speaker at annual learned society conferences). We also sought recommendations on the basis of individuals' international reputation. A number of our interviewees were independently named by other interviewees as outstanding examples of an expert researcher.

The face-to-face interviews lasted up to 90 minutes, and were audio-recorded and transcribed. The electronic questionnaires sent to the remaining informants requested the same information, using an appropriately edited version of the interview protocol.

The questions posed fell into three basic categories:

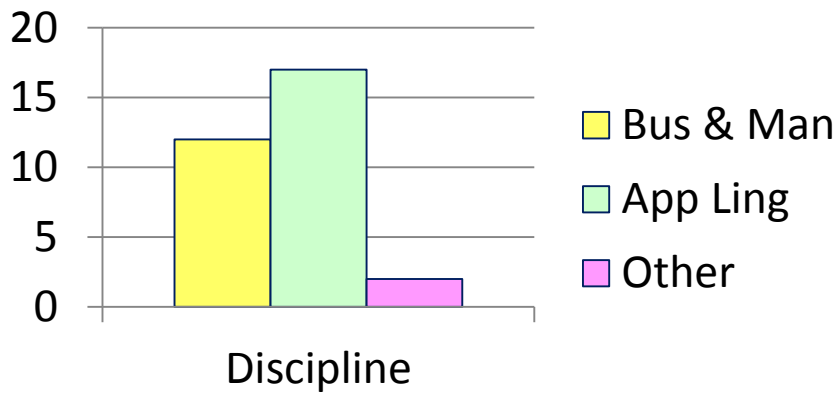
1. The nature of research expertise in your discipline
    a. How would you characterize different aspects of research expertise in [your discipline]?
    b. Describe up to three examples of researchers whom you consider to be experts. In each case, what is it that you are seeing in them that marks them out as an expert researcher?
    c. Insofar as you accept the description 'expert' in relation to yourself, what particular characteristics of an expert do you see in yourself?
    d. There's an increasing emphasis in social science research on collaboration between experts from different disciplinary backgrounds. Do you think that any specific characteristics are needed to be an expert at collaborating? Do they apply to you in your work?

2. The way in which you acquired your own research expertise
    a. What's different about how you think about things in your research activity now compared to how you thought about them early on in your career? What have you learned along the way?
    b. How did you learn the skills of an expert, particularly the thinking skills?
    c. Are there any particular people who supported your learning, such as a mentor, or a role model? If so, *how* did they help you learn to become more expert in your research?

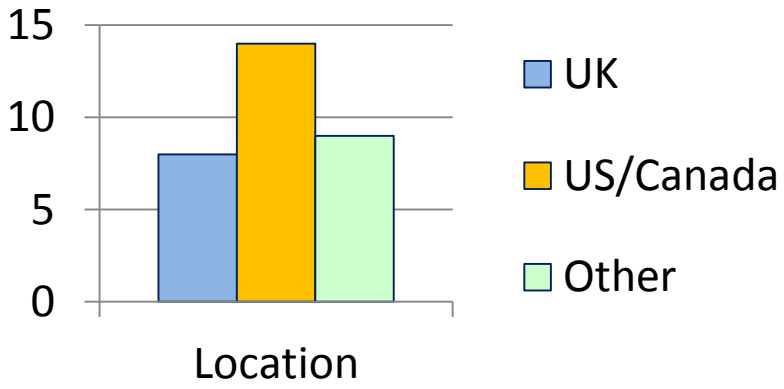
3. How you support others in developing research expertise

a. If you were advising someone about to embark on a large and complex project, what key advice would you give them regarding the likely pitfalls and ways of maximizing the chances of success?
b. Could you describe how you approach that part of your role which involves bringing on other researchers?
c. What advice would you give to the up-and-coming generation of researchers aspiring to become experts?

The quotes we provide here are largely from the responses to questions 1a, b, c and 2. However, the training we have designed draws also on responses to the other questions, particularly the insights into ways of supporting others to develop expert thinking skills.



Distribution of informants by discipline



Distribution of informants by geographical location

7 Expertise: Quotes

The quotes from the research literature are provided in a standard format, with a reference list at the end of Section 8. Quotes from the informants are followed by an identifier, indicating the informant's area of enquiry, geographical location, and gender.

Key:

AL = Applied Linguist[1] (n = 17)
BM = Business & Management (n = 11)
OS = Other social scientist (n = 3)
NA = North America (USA, Canada) (n = 12)
UK = UK (n = 10)
EU = Europe (Spain, Netherlands, Germany) (n = 3)
RW = Rest of world (New Zealand, Australia, Israel, China) (n = 6)
m = male (n =17)
f = female (n = 14)

Gender is indicated because of the potential relevance of that information in understanding individual experiences of career progression.

7.1 Is 'expert' a reliable concept?

Much of the research literature on 'expertise' offers relatively unproblematic definitions, on the basis of external and observable, often easily measurable, markers of relative ability. In chess or a sport, an expert is the person who wins most games or matches. Although one could argue that there is more to expertise than being the best (for instance, an expert in tennis could be an outstanding coach but not a top player), it can be counter-argued that in the execution of a game or sport, one does not need complex definitions that side-step the basic fact of who wins at the highest level. The coach can be accommodated separately as an expert coach. It follows that in these contexts expertise is identified retrospectively in an objective manner:

> by looking at how well an outcome or product is received, one can determine who is or is not an expert
> (Chi, 2006, p.21).

[1] Linguistics divides into many potential subcategories, including theoretical linguistics (normally viewed as part of the Humanities), sociolinguistics (Humanities and Social Science), cognitive or psycholinguistics (Social and Life Sciences), etc, and Applied Linguistics (Social Science). This last category has a long association with the concerns of education, particularly in second language learning, though it is now often broadened to encompass Linguistics applied—that is, any aspect of Linguistics that addresses social concerns, including healthcare. It is in this broader sense that we use the term here.

However, there are other areas of expertise examined in the research that are more subjectively judged, such as the master musician (e.g. Ericsson, 2006a). Here, a key feature is high-level motor skills, according to which it is potentially possible to grade expertise on the basis of the capacity to execute very difficult sequences of actions. Full musicianship, of course, also includes performance style, emotional engagement, and the deployment of musicological knowledge in the interpretation of compositions. These are more subjective, so that we would anticipate different opinions about who has the most expertise.

In the research literature, expert status is often exclusive, concerned with 'extraordinary' knowledge or performance—as with chess masters—or even with 'creative genius' (e.g. studying the thinking of Charles Darwin as evidenced by his writings). But other researchers are more inclusive, concerned with levels that many can achieve:

> Expertise is not an endpoint, it is a continuum…studies will allow us to frame and text meaningful opportunities for advancing the development of talent, however far, for ever-expanding numbers of individuals…
> (Sosniak 2006: 300)

In our interviews, the continuum view was the norm. Social science research expertise, according to the informants, has features of measurable ability along with others that are subjective (see later subsections). In addition, we found notable variation in where the informants located themselves on the expertise continuum. Some gave clear reasons for why they were less adept than someone else. Others declined to see themselves as experts, though they conceded that others saw them as one, in some cases feeling that they had been given this accolade undeservedly:

- 'I know I'm operating most of the time very much at the edge of my capabilities' [AL,UK,m]

Several articulated concern with the implications or responsibilities of being labelled expert:

- 'I think there is a danger in regarding people as experts. Anyone who eventually gets that title usually realizes that they have enormous gaps in their knowledge. One of the problems is that that unofficial title blinds people to the weaknesses in the research of 'experts'. Just because an expert says or does it, does not mean that it is correct. Once experts start believing in their own expertness, we are in deep trouble.' [RW,AL,m]

7.2 Definitions

In traditional artisan domains, the expert is the second to top category in the continuum from apprentice to 'master'. An expert is certificated as knowing a craft (Ericsson, 2006b), and a master is additionally 'qualified to teach those at a lower level' (Chi, 2006, p.22).

Most of our informants saw 'expert' as the top level of ability. Only one explicitly distinguished a large group of 'experts', defined as anyone with a doctorate and research-focussed activity, versus 'very rare people' who 'get offers from Stanford and Harvard' [BM,NA,f]. This informant viewed herself as in the former but not the latter category.

One general definition of expertise, which embodies thinking, is:

- 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

(Schraw 2006: 259)

Since no one is born possessing expertise, it is typically defined in terms of individual capabilities acquired through experience. Characteristics of expertise, including expert thinking, distinguish experts from novices. Criteria widely used for identifying individual expertise are a combination of three kinds:

- Social (reputation, as attributed by others)
- Length of experience in the domain
- Consistent high-level performance of tasks within this domain.
  (Ericsson 2006b)

However, the views of the informants were more nuanced and detailed.

7.2.1 Knowledge

Expertise is intrinsically linked to knowledge in a particular domain or its constitutive sub-specialisms. So expert thinking is a style appropriate for that area of knowledge, rather than a set of transferable skills that are appropriate for all domains. Some domains are more closely allied than others, of course. Thus, even insofar as there is a single social scientific thinking style appropriate to the contested terrain of what counts as knowledge of society, it would not be expected directly to transfer to the knowledge relevant to chess playing). Ochse discusses evidence from a study of Nobel Prize winners:

> We must not forget that these subjects referred specifically to domain relevant thinking styles taught by masters in that field.
> (Ochse 1990: 259)

The informants considered that expertise required a core level of knowledge based on extensive reading as well as experience, but did not expect an expert to know everything.

They valued integrated knowledge, particularly in relation to combining theory and empiricism:

- 'When you go to conferences and you don't learn very much, I think that's when you realize that you've become a bit of an expert in your field' [OS,UK,f]
- 'An expert is 'up' on the topic at hand, familiar with the range and breadth of the field, knowledgeable about ancillary fields, follows particular writers, researchers, journals and topics' [AL,NA,f]
- '[An encyclopaedic knowledge] would keep you from being flexible in your thinking. You'd know too much to be creative' [BM,NA,f]
- 'It's very difficult to see [the] gaps if you're immersed in the literature' [BM,UK,m]
- 'I've known specific people whose research career was frozen and stultified by the fact that they had to read everything' [OS,UK,m]
- '[It's best to have] a smaller focus of expertise and to be absolutely world-standingly on top of it…it's easier to become an expert if you're in a restricted area [OS,UK,f]
- 'While some experts may be stronger in theory and others in methodology, an ideal expert should blend the knowledge and understanding of both aspects of their chosen area' [AL,NA,f]
- [Without theory] 'you're not going to publish in the top journals' [BM,UK,m]
- 'They should…have lots of experience in doing research so that they can appreciate the difficulties of operationalizing research' [AL,RW,m]

7.2.2 Mental capacity and thinking style

For the informants, expert researchers asked good questions, and did not take things for granted. They had imaginative, extraordinary ideas, were able to see different points of view, were inquisitive, could see boundaries and patterns, and were rigorous thinkers.

- 'A good question here means one that others in the field would…immediately recognize as important to be answered…Good means it's answerable in principle or even in practice with what we know today…' [AL,NA,m]
- 'What you know and begin to take for granted, or as an assumption, by definition you don't question, and if you don't question then there's probably not further study of it' [BM,NA,m]
- 'You can have theory and data and not have any ideas, so I think that imagination and ability to look at things in a different way…that's critical' [OS,UK,f]
- '[They] come up with the most amazing clever ideas. They see something out there which once they see it you think, my gosh, why didn't I think of that before?' [BM,NA,f]
- 'That person not only has a knowledge of alternatives but can go into depths about each alternative, can articulate the theory, if you will, of those alternatives. Has an ability to argue each perspective' [BM,NA,m]

- An expert [is] one who not only has a body of knowledge but who continues to search for advancing that knowledge…' [BM,NA,m]
- 'What I like to think I'm good at is crossing boundaries…I like to hear what people of a different perspective on a general topic area have got to say. I find myself immediately thinking, how can I turn what they've said into something that I could capitalize on in my own work?' [AL,NA,m]
- 'I can see how different pieces of work go together and inform each other, and I can see how things can fit together and be answered' [OS,UK,f]
- 'An ability to take a step back and see the forest beyond the trees' [AL,NA,f]
- 'The point is to rub theory into the practice' [BM,NA,f]

7.2.3 Procedural skills

The recognition of procedural skills in the portfolio for expertise depends on the incremental grading of task processes and outcomes being widely accepted as valid and reliable. But grading may be contested. For many practical task areas within a domain few, if any, criteria have been established (e.g. for judging expertise in leading research projects, mentoring researcher colleagues).

> Although it might seem desirable to rely on objective criteria, external standards frequently do not exist for many real-world problems (such as livestock judging). Indeed, experts are essential in precisely those domains where there are *no* right answers. Even when standards do exist, as in auditing, it is experts who establish these standards and who have the power to change them. Thus experts define the standards, not the other way around.
> (Shanteau 1988: 205-206)

For the informants, skills were a necessary but not sufficient component of research expertise. Skills considered relevant included being a good writer, possessing high methodological competence, having an eye for detail, being able to manage several things at once, being able to theorize, and having the capability to respond flexibly.

- 'Somebody who can write about [their research] really well and somebody who can stand up and talk about this in a very persuasive and clear way' [AL,RW,m]
- 'I can tell you this very interesting story. At the end of it there's a very big question you're going to ask: So what? And that's when you start engaging with theory' [BM,UK,m]
- 'One of the classical mistakes, I think, is to be method driven...The mistake that people make is they start with the wrong method, so the method is misaligned' [BM,UK,m]
- 'Any decent project that I've done has involved me totally rethinking where I'm going at least ten times' [BM,NA,f]

- ‘I think part of expertise, at least in my area, is learning how to navigate [the] quantitative versus qualitative research divide which exists, and to me it’s a completely false divide. It shouldn’t be there…I see far too much still where people are entrenched in one or the other, and they think somehow there is a hierarchy’ [AL,NA,m]

7.2.4 Length of service

This criterion does not, in itself, indicate how much the content of evolving experience matters—including the balance between repetition and novelty, and the amount of sustained effort to improve task performance. It leaves implicit how the amount of time spent working in a domain contributes towards people displaying identified characteristics of expertise, and whether this amount is the same for all individuals in all domains (e.g. what is it about the length of job experience that helps one social science researcher to gain more expertise than another?). Classic research on chess players resulted in the finding that others have generalized as the ‘ten year’ or ’10,000 hour’ rule:

> There appears not to be on record any case (including Bobby Fischer) where a person reached grandmaster level with less than about a decade’s intense preoccupation with the game. We would estimate, very roughly, that a master has spent perhaps 10,000 to 50,000 hours staring at chess positions…
> (Simon and Chase 1973: 402)

Length of experience was more implicit than primary for our informants. The strong emphasis on thinking skills overall suggested that research expertise was tied into an approach to research that could be evident from early on, and indeed that could be used to select PhD students for nurturing (see Section 8).

- ‘Learning through experience is very important’ [AL,RW,m]
- ‘I learned by experience. I progressed from smaller projects to larger ones and periods of reflection on what we had learned were helpful. I imagine this is pretty typical of the experience of most applied…linguists involved in research projects’ [AL,RW,f]
- ‘I essentially believe that you should be continually learning, evolving and developing. It’s what we’re paid to do’ [BM,NA,m]

7.2.5 Recognition

With few reliable external measures as objective matches won in sports and games, social science research experts were widely acknowledged to be those individuals raised to that status by their peers. As one applied linguist put it, ‘expertise is a two-place predicate’ [AL, UK,m][2].

[2] A two-place predicate is a word that requires, to complete its meaning, two other ideas. Thus, *discuss* is a two-place predicate because there must be someone to discuss and something to discuss; in contrast *weep* is a one-place predicate because it only requires someone to do the weeping; *give* is the three-place predicate

- ‘It’s not an objective quality. It requires a certain amount of recognition from the community for you to be defined as an expert, and that recognition may be slower or quicker in coming’ [AL,UK,m]
- ‘You define [expertise] by the fact that individuals on the outside understand and recognize that you have a high ability on those skill levels’ [BM,RW,m]
- ‘It really is a social construction process, how we classify and label people, and expert is really not what is in one’s head, it’s how others’ heads judge this person’ [BM,NA,m]
- ‘Expertise has to be defined in terms of standards of the world that generally seem accepted—you may not like those standards, you may think those standards are wrong‘ [BM,NA,m]
- ‘[This question] made me reflect on the implicit criteria I use to decide who I consider to be experts in particular fields (e.g., to invite as conference plenary speakers, organizers of invited colloquia or authors of book chapters)’ [AL,NA,f]
- ‘I could concur with you that I am seen as an expert because I receive letters from people saying, as you are an expert on this...’ [OS,UK,f]

Thus expertise is a social construct and, as such, relies on how others become convinced about the significance of someone’s research performance. In some instances, appearances may be deceptive. Certain socially-sanctioned markers could become proxies for expertise (e.g. social scientists’ ability to ‘talk the talk’, their self-presentation as being an expert, or their receipt of awards implying that selectors hold them in high esteem for some reason).

> [According to one manager] ‘an expert is anyone who can persuade someone else that he (she) is an expert’.
> (Dino and Shanteau 1984, cited in Shanteau 1988: 209).

- ‘I’m basically known for one paper, which is very highly cited’ [BM,NA, f]

Insofar as someone with expertise must interact with others to be recognized as such, good communication skills are needed. They included a capacity to know what is interesting to others, and to work on the things that others care about. This feature of expertise was more often identified by the applied linguists (Section 5.1.3).

- ‘The applied linguistics experts I know have a remarkable ability to communicate very clearly the important insights they have gained from their research. They are good researchers and good communicators’ [AL,RW,f]
- ‘There’s no point being authoritative about something people are not interested in.’ [AL,UK,m]

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because it requires a giver, something that is given, and someone that it is given to. Expertise as a two-place predicate therefore signifies that you can’t just *have* expertise—someone else has to be involved, to perceive you as possessing it.

- ‘Able to … sniff out something that was absolutely critical… that has social currency, not just academically, but financially, organizationally, socially, culturally, artistically’ [AL,RW,m]

Other academics were most impressed by someone who altered how they saw the world.

- ‘Somebody who can change the way I think about something by asking me questions, that forces me to put knowledge into different relationships from what I had before, and gives me tools for thinking about it differently. What’s exciting about talking to an expert I think is when that person is able to make you see new horizons for the boundaries of their knowledge’ [AL,NA,m]
- ‘I invest a lot in pushing various types of uncomfortable points, because pushing comfortable points isn’t really particularly useful’ [BM,RW,m]

7.2.6 Personal traits

Barely mentioned in the research literature, though implicit, are the emotional aspects of expertise. They featured heavily in the informants’ responses, with experts described as passionate, confident, persistent, able to cope with negative feedback, humble, self-aware, mature, professional, committed, able to work with others, patient, pragmatic, and supportive.

- ‘A real burning desire to understand something’ [OS,UK,f]
- ‘We need confidence in ourselves, identity is crucial, self-identity, with respect to knowledge…I’m OK and you’re OK, now let’s talk. But if I’m not OK I’m going to feel very intimidated or threatened by you who really are OK’ [BM,NA,m]
- ‘An expert would be a very open person, open and listening to the ideas of others in relation to themselves….If [a] person’s not open they become a dilettante, an authoritative ‘I know best’ fundamentalist…[which] would have to disqualify them [as experts] because they become converts, advocates for a point of view that is no longer open to reconsideration or a critical attitude’ [BM,NA,m]
- ‘There are some people who just are never going to get there because of what I would call temperament, personality. They don’t want to listen, they want to do what they want to do. Some people are attracted to academia because they love the sound of their own voice…and they really don’t want to read or engage with others’ [BM,NA,f]
- ‘You have to be able to survive setbacks and keep going...you’re rejected all the time’ [BM,NA,m]
- ‘[An expert] keeps working until a problem is solved’ [AL,NA,f]
- ‘In my view a successful researcher needs the skills of affective management, that is, a great ability to manage one’s own emotions, to reduce anxiety common among those engaged in intellectual pursuits, and to dominate negative emotions common in responses to criticisms of one’s own work’ [AL,NA,f]

- ‘The issue of ego in research and willingness to admit...that they changed their minds or they found something wrong that they did before...in my mind that makes them more expert’ [AL,UK,f]
- ‘Someone once said, you can accomplish anything if you don’t care who gets the credit for it. I think that’s a tremendously wise thing, and it works’ [AL,NA,m]
- ‘Someone who cares about junior people will give them opportunities, will introduce them to people, will author papers with them…you’re hands on with these people until they can pretty well do it themselves’ [AL,RW,m]

7.2.7 Types of expertise

There was unanimity that there is more than one type of expertise. Almost without exception, informants first defined expertise in terms of broad, multifaceted knowledge. But when asked if this was a core definer, many observed that it was also possible to be very expert in one method or approach. Such expertise would require collaboration to achieve a rounded research product. Two other contrasts were identified.

Lumper versus splitter

- ‘The splitters are those who are trying to set up their work as unique, as different, as separate from all of these other approaches that are wrong. The lumpers, on the other hand, are trying to integrate, they compare and contrast and see how their approach compares with others and then make…comparative assessments between these alternatives…Splitters…are certainly experts. But they tend to be more narrow, they tend to be deeper and narrower whereas the lumpers are perhaps shallower and broader. And I think that is a trade-off’ [BM,NA,m]

Deep versus holistic

- ‘One [type of expert] is the individual who demonstrates an in-depth understanding of some particular area. When you think of the area, the individual leaps immediately to mind. The person has a coherent research programme, has pursued it over time, is fully aware of the research of others, and can speak and write authoritatively on the particular area. The other type of expert is someone for whom the ‘big picture’ is important—someone who is capable of, and, in fact, has carried out highly focused research, but someone who values bringing in ‘outside’ perspectives and who enjoys thinking ‘outside of the box.’ [AL,NA,f]

7.3 Group expertise and the role of collaboration

Psychologists tend to construe expertise and expert thinking as primarily a property of individuals—expertise resides in the heads of experts. Sociologists tend to construe expertise and expert thinking more as products of social interaction—expertise resides in the heads of those who label people as expert practitioners or expert thinkers. Both perspectives are helpful and may be combined:

> Knowledge—in a sense—must exist inside heads. Where else could it reside? As an analogy…when the expert carpenter leaves the workshop, something does leave with him. Could you or I use the tools to build, say, a china cabinet?
> However, knowledge—in a sense—is an attribution that resides in social groups. How else could it be developed, taught, or standardized? How could someone be regarded as an expert if her judgments are not followed in the decisions made by other people?
> (Hoffman 1998: 94)

These two elements unite in the expectation that better research outcomes can be achieved through collaboration.

7.3.1 The value of collaboration

Most of our informants were serial research collaborators rather than habitual lone researchers. Collaboration was generally viewed positively in principle.

- 'There are fewer and fewer studies I think in my field where somebody just writes an article themselves, unless they're a junior faculty member who needs to do it to get tenure' [BM,NA,f]
- 'I had a very particular idea and I knew I didn't have the expertise to pull it off. And so I knew I needed help, and after some time because I'm persistent, found the help' [BM,NA,m]

However, as quotes below indicate, collaboration was not necessarily straightforward to manage in practice.

7.3.2 Mutual understanding

For collaborative research, each team member must understand enough about other members' complementary specialist expertise to work productively with them. The larger, more interdisciplinary, and more multi-method the collective research effort, the more interdependent members become, since no member has specialist expertise in all the contributing disciplines or methods. Each must possess or develop sufficient interdisciplinary and methodological 'literacy' to engage in meaningful dialogue with the others, so they collectively achieve more than individuals could alone. A rare instance of sociological research on expertise—examining the nature of expert knowledge in an area of science—has generated the notion of 'interactional expertise'. This is the ability to 'talk the walk' in a domain of expertise, without direct experience of performing the expert's practical role. Collins defines interactional expertise as follows:

> There is an important kind of specialist expertise, called 'interactional expertise' that turns on fluency in the language of the domain rather than hands-on experience; it is acquired more through immersion in the discourse of the hands-on experts than through participation in their characteristic practices.

(Collins 2007: 615)

Our informants recognized that an expert researcher will be able to bridge the gap between the two knowledge sets, so as to build bridges. Rather than interactional expertise in Collins' sense, however, the more often spoke of the willingness to ask questions and test assumptions, so as to avoid misunderstandings and further mutual knowledge.

- 'I've discovered that we use [some words] in the social sciences in an entirely different way to computer science and so you just have to get down to real basics and pin down what your assumptions are' [OA,UK,f]
- When you feel there's a clash, that something's not quite being mutually understood and then pushing through and saying "well, what actually do you mean by that?"' [AL,UK,f]
- 'When we do our research [the collaborator] doesn't really know the things I'm talking about. "What do you mean, the type-token ratio? What do you mean, the sentence length?…What are the constructs you're using? Are they meaningful?" But actually by having to explain it, it becomes clearer to you yourself, what it is that you're doing' [AL,EU,f]
- 'Seeing the world through someone else's eyes' [AL,UK,f]
- 'You have to move out of your comfort zone...and work in it and not worry about the fact that you don't know the answers' [AL,UK, m]
- 'You have to be willing to accept ideas of other persons, back up and let others take the lead as well as you' [AL,NA,f]
- 'You need an equivalent level of expertise in what you're both bringing, but then you also need an understanding of where the other person's at' [AL,UK,f]
- 'I needed someone who could help me write a theory article [on a topic I didn't know]...she taught me a huge amount of stuff that I didn't even know existed, plus giving me new theory building ideas' [BM,US,m]
- 'The nuts and bolts of keeping a project on track, I'm really not very good at that. I have a colleague who is much better, thank goodness, at doing that' [BM,NA,f]
- 'If I am leader of a research team, I need the interactive expertise to span the boundaries of the disciplines that people have, that are needed to address the project question.. [You have to put in] enough work so that you have the competence to be able to be considered credible to the participants of their respective domains' [BM,NA,m]
- 'You've got to gain the tacit knowledge pertaining to somebody else's field' [OS,UK,m]
- '[To gain access to busy experts] I would have to pay my dues, I would have to read quite a bit, I would have to take some formal education so that I would, at least, be able to speak the language to show that I am really interested' [BM,NA,m]

However, an expert researcher also needs an instinct for whether a collaboration can be made to work effectively.

- ‘You do need to know how people work, not just what they say... it’s about working style, not just knowledge’ [AL,UK,f]
- ‘You need to work out why you’re working together, what you’re each going to bring, and whether you’re working as equals or not, how you’re going to publish, what your strategies are. There’s an awful lot of working out of quite hard-headed details beforehand, so you don’t trip over’ [OA,UK,f]
- ‘Some colleagues I can work with, and some I can’t’ [BM,NA,f]
- ‘There are some teams that work, and some that don’t. Don’t ask me why’ [BM,UK,m]
- ‘I do know that some experts are difficult to work with, but there are also some who are easy to work with and are open to new ideas. I consider myself easy to work with, but I know not everyone around me thinks so. Collaboration does not always happen.’ [AL,RW,m]
- ‘I realized I really enjoyed working in a team and I have done so ever since. I am good at working with others and coping with many different work-styles, and this has been a real asset’ [AL,RW,f]
- ‘I think special skills are required in collaborating and they are personal skills as much as research skills’ [AL,RW,m]
- ‘Withdrawing from collaborations is another thing you have to be expert at’ [AL,UK,f]

7.3.3. Releasing creativity

- ‘One of the things I have learned is that if you just put half a dozen smart people in a room together you don’t have to have too much of an agenda for something good to come out of it, as long as people obey certain social rules such as respecting each other, being flexible and letting ideas flow together. That works. People enjoy it as they feel they’re getting involved, they’re contributing something and they’re learning something…but if it isn’t fun and people feel they’re being socially pressured to do things that they wouldn’t otherwise want to do, because they don’t have time for it, it’s going to fail’ [AL,NA,m]
- ‘You have conversations on things you couldn’t imagine on your own...at the end of the day when you’re drinking that bottle of wine and you’re working on the debrief of the [jointly conducted] interviews, you wish you could take the white tablecloth of the restaurant with you because you’ve written on it’ [BM,NA,f]
- ‘I’ve seen two ways of collaborating. One is less likely to be successful...you have a perspective on a topic which is different from my perspective on a topic, and it’s kind of interesting to hear what we each have to say. But neither of these perspectives has a real impact on the other. [The other approach] is to develop this larger picture of the problem which makes both perspectives absolutely indispensable and inherent in that larger picture…So it’s not just interesting add-on to their work, it’s a necessary component and they have to feel the same about yours’ [AL,NA,m]

- ‘it seems to me magical that, for example, statistics experts be involved in work with colleagues doing quantitative research or that child psychology experts be involved in Applied Linguistics or Second Language Acquisition work with school subjects.’ [AL,EU,m]

7.3.4 Thinking in new ways

- ‘I think to be an expert in collaboration…you have to listen and look at it from other people’s perspectives’ [OS,UK,f]
- ‘The first quality is to try to be open to understanding another point of view. But, this is not something that can be done superficially or selectively. One has to truly learn to think differently. One of the challenges of interdisciplinary collaboration is the need to remain as true as possible to how ideas are portrayed in the allied discipline.’ [AL,NA,f]
- ‘One needs to be able to find time to read the literature in the other field and to understand the limitations of one’s own professional upbringing. Because scholars coming from different disciplinary perspectives may adopt very different views of and approaches to the same problem. In the study of the same area of research, such as the bilingual mental lexicon, psychologists and linguists often articulate very different research questions, make different assumptions, and apply different methods, as a result speaking past each other. Interdisciplinary collaborations help us evaluate each other’s assumptions, reassess our own, combine methodologies in order to satisfy requirements in each field, and find ways to speak to each other’ [AL,NA,f]

8 Learning expertise: Quotes

How one develops the different components of expertise and expert thinking is contingent on what those components are and how they relate to each other. We should anticipate, therefore, that research into the development of types of expertise that do not fully reflect the particular case of social science research will have only limited application. Nevertheless, there are some useful pointers from the research literature, which complement the direct experience of our informants. Many of the quotes from the interviews derive from answers to question 2(a) in Section 6.2, regarding differences in how the informants think now compared with when they started out.

8.1 What can be acquired and what cannot?

A minority of published accounts conceive expertise and expert thinking as 'absolute' (you've either acquired them or you haven't) and the capacity to acquire them as inherent to the individual (you can either think that way or you can't). Experts are assumed to be exceptional individuals. We did find a small measure of this view amongst informants:

- 'You certainly have to have predispositions to want to do certain things and to be able to do certain things,' [BM,NA,m].

Several informants considered that one could spot already in a student the potential to develop into a research expert. However, the more common view in the literature and expressed by informants was that expertise and expert thinking are conceived in 'relative' terms (expert researchers have acquired the characteristics of expertise to a greater degree than novices), with the implicit or explicit assumption that at least some novices are on a development trajectory. According to Chi (2006), such researchers assume that:

1. Experts have more knowledge, which is structured in some way
2. The basic abilities of experts and non-experts are similar (so non-experts have the potential to become expert)
3. Differences in performance are connected with the way knowledge is structured.

8.2 What is it that develops?

8.2.1 Self-monitoring

A key generalization from cognitive psychological studies of expertise is that individuals gradually build up their powers of 'metacognition' within the domain (i.e. an understanding of their own cognitive processes). Metacognition enables them consciously or more automatically to monitor their thinking, backtrack from blind alleys, recognize when a problem is non-routine, and adjust accordingly (e.g. experienced social science

researchers will come to know how little they or anyone else knows, and adopt a reflexive, self-questioning approach towards their work).

> The development of expertise is largely a matter of amassing considerable skills, knowledge, and mechanisms that monitor and control cognitive processes to perform a delimited set of tasks efficiently and effectively. Experts restructure, reorganize, and refine their representation of knowledge and procedures for efficient application to their work-a-day environments…experts certainly know more, but they also know differently.'
> (Feltovich et al 2006: 57)

- 'When I was a PhD student, I tried to think about questions in…the more conventional way, which is to be more linear. And to say, "Well, this research…produced these findings, and if we extrapolate that, then we should find this…" [But now] I won't be excited unless I can see how it fits into a bigger picture of some sort.' [AL,NA,m]

8.2.2 Chunking

The nature of what is remembered and can be recalled as a starting-point for thinking changes with increasing expertise in a domain. Experiments with chess players showed that masters memorized information about positions of pieces in larger, more complex, interrelated configurations or 'chunks' than novices.

> The data suggest that the superior performance of stronger players…derives from the ability of those players to encode the position into larger perceptual chunks, each consisting of a familiar subconfiguration of pieces. Pieces within a single chunk are bound by relations of mutual defense, proximity, attack over small distances, and common color and type.
> There is also some evidence that chunks may be held together by more abstract relations. There are more chunks in recall for the stronger players, yet the frequencies of between-chunk relations…are all close to chance. This may derive from a hierarchical organization of the chunks, related to chess skill, that is more abstract than the simple chess relations we have measured.
> (Chase and Simon 1973: 80-81)

Packaging of information into more sophisticated chunks may also occur in other domains (e.g. social scientists memorizing 'typical' kinds of theory, methodology or finding across multiple studies within a field, or 'stock' arguments and counter-arguments within a debate).

- 'Although I can see evidence in my early research activity of a critical approach to reading, it was not until much later that I developed some fluency in the skill of reading critically' [AL,NA,f]

The proceduralization of knowledge may have an effect on the outcome. In a task that requires an 'open mind' in order to ensure no possible options are overlooked, experience of the task may simultaneously support open-mindedness and reduce it: one learns how to discard the least likely options and quickly reach the most appropriate solution.

> The psychology of human inference demonstrates that keeping an open mind is simply not possible; in the absence of information, individuals extrapolate and frame problems on the basis of their prior knowledge and beliefs.
> (Wright 2013: 193)

8.2.3 Flexible restructuring

The greater knowledge of experts is organized in more abstract ways than novices, reflecting principles or patterns rather than simply additive concrete 'facts'. Some of this synthesized knowledge is represented in dynamic, abstract mental models which include cause-effect schemata. Such models are flexible, open to modification if new information does not fit. A classic study compared how undergraduate and postgraduate students solved problems in physics (Chi et al 1982). The postgraduates referred more to underlying principles, whereas the undergraduates attended mostly to surface details. Reworking of knowledge into more abstract forms may also feature in other intellectual domains (e.g. social scientists mapping multiple theoretical and methodological orientations within and possibly between broad paradigms).

> ...novices are essentially just as competent as experts in identifying the key features in a problem statement. The limitation of the novices derives from their inability to infer further knowledge from the literal cues in the problem statement. In contrast, these inferences necessarily are generated in the context of the relevant knowledge structures that experts possess.
> (Chi et al 1982: 71)

- 'I probably didn't appreciate the bigger picture, I probably didn't appreciate that it was possible to bring together a number of different elements to inform a project' [OS,UK,f]

With increased knowledge comes the potential for greater sophistication in thinking.

- 'When I was a graduate student I imagined that all one needs to be a researcher is...to know the literature and have some methodological expertise, and that's basically it' [BM,UK,m]
- 'I remember the feeling of frustration I had after writing my first book...At that point I was aware that I had read most of what was written about [the topic], but I did not see clear avenues of research arising out of that. It was not until several years later that I began to get a clearer picture of what research needed to be done' [AL,RW,m]
- 'Roughly every decade I discovered something in terms of, say, a method[ological] approach that I thought was more meaningful and helpful than the previous one. This at

the same time increased my uncertainty as to how I understood what was going on' [BM,UK,m]

- 'Lots of reading, lots of research and lots of talking and writing about research have resulted in an awareness of what we need to be careful about when doing research' [AL,RW,m]

8.2.4 Tacit or explicit knowledge?

Novices tend to be aware that they are learning new knowledge and skills, which are often explicitly taught. But with repeated practice, much of this knowledge and the smooth performance of skills becomes 'tacit': expressed so automatically in carrying out tasks that experts may not be aware of what they have learned to do and or how they do it. They have distilled many variations between different 'cases' of the same kind of experience. Such deep knowledge is synthesized in experts' habitually intuitive approach (e.g. experienced social science research interviewers may draw on their intuition to decide, in a particular situation, whether to divert from the protocol).

> With enough experience in a variety of situations, all seen from the same perspective but requiring different tactical decisions, the brain of the expert gradually decomposes this class of situations into subclasses, each of which requires a specific response. This allows the immediate intuitive situational response that is characteristic of expertise. (Dreyfus and Dreyfus 2005: 787)

- 'Knowledge and skills [can be] so ingrained that the person can't even articulate them. It's just natural, it's part of your body, or part of the way you do things, and it becomes second nature' [BM,NA,f]

Elements of expertise that are tacit may not be amenable to training, since they will be difficult to talk about.

- 'Experts cannot explain why or how they are experts because it's recessed so deeply in their mind they lose that explicit knowledge of how and why one and one made two, it just does. So if you wish to understand an expert, see what he or she does, not what he or she says' [BM,NA,m]
- 'The ability to look at things in a different way...[is] something that it may be most difficult to teach' [OS, UK,f]

Nevertheless, experts may be able to verbalize some of their tacit knowledge by talking aloud about what they are thinking while they perform tasks, even if they do not normally do so. Furthermore, in our data we found that Applied Linguists did not propose expert knowledge to be tacit in the same way as the other informants did. This may be because of the significant influence within Applied Linguistics of issues around the teaching of language knowledge, of which many components are widely considered tacit in native speakers, but which teachers must surface in order to explain them to learners.

8.2.5 Emotion and motivation

The iterative endeavour to develop expert thinking by taking on tasks that reach beyond an individual researcher's comfort zone is a perpetual challenge. It very often results in failed attempts along the way. To understand the process by which learning occurs, one needs to understand the different ways in which challenge and failure can impact on motivation, and which coping strategies will help to maximize learning from failure.

- 'My first paper I submitted…I can look at that paper now and think that they were very kind in their reviews. But I was devastated. I thought my career was over. I sent in this thing that was totally inappropriate. I didn't know how to write for the journal. I just did a small version of my dissertation, and it was totally wrong because I wasn't in the conversation' [BM,NA.f]
- [Of things going wrong]: 'When it first happened to me it was terrifying. I did not love it, but now I've learned it's going to be okay. Things usually work out in the end, if you stick at it for long enough and you're ready to let things happen' [OS,UK,m]

Many other affective elements also play a part, including confidence, and coming to know one's strengths and weaknesses and working with them.

- 'I probably was far too tentative in pushing my own thoughts, I was lacking in confidence, I'm sure' [OS,UK,f]
- 'I think I've learned that I'm better at conceptual theorizing than at empirical research. In the beginning I was doing lots of empirical work…but I wasn't creative at it, and it appeared, at least to me, that I enjoyed and was better at trying to speculate about the big picture.' [AL,NA,m]

8.2.6 Getting to know the ropes and becoming streetwise

In an activity as complex as social science research, there are many things to integrate, and experience brings with it the opportunities to see how they fit together. The outcome can be surprising—a complete reassessment of what it is that one is trying to achieve.

- 'I have learned to plan ahead, to set objectives and review them regularly…' [AL,RW,f]
- 'I have...somewhat revised my definition of good scholarship. I now think that an expert is someone who remains open, questing—prepared to shift perspectives, even whole theoretical commitments—when the evidence suggests that they are no longer worthy' [AL,NA,f]
- 'Perhaps I show more respect for facts than years ago, when I would stick to certain facts while ignoring others [AL,RW,m]
- The key change in my own thinking is that I no longer think of my professional activities in terms of 'publishing' but in terms of social relevance, scholarly importance, and impact...Given the limited time-frame we all have for any kind of meaningful activity, this approach leads me to prioritize activities I design myself (i.e. my own studies, books,

and articles) and turn down most of the invitations I get, because they advance other people's agendas rather than my own. [AL,NA,f]

8.3 How can development be accelerated?

Some of the main ways in which learning might be accelerated are:

- accessing learning opportunities not normally available
- increasing the frequency with which available learning opportunities are accessed
- recalibrating, redeploying and reconceptualizing existing activities as learning opportunities.

Thus, we need to consider accelerated learning within the frame of the potential opportunities for learning *at all*. In doing so, we should consider whether all types of learning actually can be accelerated. Some aspects of expertise may be intrinsically time-anchored, though many, even *clocking up the years*, could arguably be speeded through a either tighter concentration on consciously learning through the experience of doing research, or by packing more learning opportunities into a given time frame.

8.3.1 Training

Around half of our informants expressly stated that neither training nor mentoring had contributed to their development of research expertise. Given the age-demographic of the sample, this may reflect the limited opportunities for both when they were mid-career. There was a strong conviction amongst the informants that they had learned by doing, not by being guided or told.

- 'There are not many opportunities to do courses on research, and such courses often lack immediate relevance.' [AL,RW,m]

What, then, does it mean to learn by doing (with or without training or mentoring), and how can one increase the rate at which such learning happens, as far as is possible?

8.3.2 Deliberate practice

Research evidence suggests that becoming an expert thinker requires prolonged immersion in a domain, but that time alone is not sufficient. What people do with their time is critical for maximizing the pace of development. Ericsson studied instrumental musicians learning advanced technique. He found that improvement could be iteratively accelerated through regular, quite short periods of practice and feedback that required intense concentration. These sessions were designed by teachers to keep stretching the musicians incrementally a little way beyond their present 'comfort zone'.

The expert performers and their teachers identify specific goals for improving particular aspects of performance and design training activities that allow the

> performer to gradually refine performance with feedback and opportunities for repetition (deliberate practice). The performers will gradually acquire mechanisms that increase their ability to control, self-monitor, and evaluate their performance in representative situations from the domain and thus gain independence from the feedback of their teachers.
> (Ericsson 2006a: 694)

Equivalent 'deliberate practice' may be applicable to other domains that involve extensive thinking (e.g. social scientists improving their ability to write for publication in more demanding journals). The point of 'deliberate practice' is moving just beyond one's comfort zone (but not too far), and putting oneself in the way of opportunities to learn.

- 'I see anonymous peer-review as central in the expertise-building enterprise' [AL,NA,f]
- 'One or two colleagues were very useful in developing my research skills largely through discussion and through co-operative critiquing of research designs. Their main help to me came through their pointing out the weaknesses of my designs and suggesting other possibilities. I have also learned a lot through listening to others describe and justify their research designs.' [AL,RW,m]

Practice without that cutting edge of challenge can amount to little more than repetition. Evidence suggests that most learners rapidly become proficient enough to perform tasks within a domain intuitively and autonomously. But many then simply continue practising what they already know how to do, and their performance stabilizes at this level. Further improvement is made possible when individuals maintain enough awareness to keep thinking about what they are doing. They habitually monitor their own performance while making intentional modifications and adjustments to enhance it.

> …individuals who eventually reach very high levels do not simply accumulate more routine experience of domain-related activities, but extend their active skill-building period for years or even decades.
> (Ericsson 2006a: 691)

8.3.3 The research environment

The single most consistent catalyst to developing expertise that was mentioned by the informants was the research environment (reinforcing our emphasis in Section 4.3 and 4.4).

- 'I did doctoral work in a prestigious, Ivy League US university, where I participated in conferences, workshops, and summer schools and met many prominent scholars while still a doctoral student' [AL,NA,f]
- 'So what made some people fast learners? Well we all think of that as an individual trait, but it could also be that they were exposed to a set of enabling conditions that made the rapid learn possible' [BM,NA,m]

- ‘I do not know of any formal way to learn to be an expert. I suppose I learned by watching and reading others, listening to and engaging with them. I have also had a succession of co-authors; sometimes I have been the senior author, other times the junior author. I am sure that I learned from both roles’ [AL,NA,f]
- ‘We can learn by osmosis, just being around people, and for me this means not being too much of a hermit, not working in a little cubbyhole somewhere’ [AL,NA,m]
- ‘These people just write superb prose, and I tried to copy them’ [OS,UK,m]
- ‘I was strongly influenced in the choice of [my specialist] areas by senior colleagues I worked with early in my career. They did not direct me towards these areas but, through talking to them and observing their own research, I developed a strong interest in what they were doing’ [AL,RW,m]
- ‘I remember being struck by this atmosphere of high-powered research that seemed to be in the air there. In the seminars it was perfectly relaxed, they didn’t feel very competitive and they didn’t feel stressful...a couple of profs were essential in providing that spark’ [AL,EU,f]
- ‘I learned a great deal from the ‘big cheeses’ from politics and policy from the UK and other countries [who] used to come in. And everybody would go down to coffee and tea to the common room every day, twice a day usually, because you never knew who was going to be there. There would always be somebody interesting’ [OS,UK,f]

It follows that researchers need to seek out a nurturing research environment. Building up one’s own environment is clearly beneficial (see below) but if that is not enough, opportunities need to be taken to enhance experience.

- ‘I had no idea of the quality, calibre and community that I was going to be joining...[plus] other young academics who were very open, very willing to discuss ideas and formed the basis of a network that lasted me in one way or another throughout my career’ [BM,UK,m]
- I think sabbaticals are an underestimated benefit. They should go somewhere…You need to go somewhere else to revitalize. Time is critical for research. If you’re doing four courses, you cannot do research’ [BM,NA,m].

Research environments have to be built and nurtured. Our informants were often taking active steps to achieve that for their students and junior colleagues, with knock-on benefits for themselves.

- ‘We have a very active Speaker Series, which gives my students opportunities to organize visits, meet and talk to well-known researchers (and get feedback on their own projects), and to see firsthand a variety of experts in the field. After the visits, I engage the students in critical discussions about what they saw and learned, and give them extra credit for papers that articulate such critical reflections’ [AL,NA,f]

- ‘See yourself as a citizen in your context where you do your work. You cannot do your work in isolation, so you’re dependent on the environment that surrounds you. So the first thing is, you’re not entitled to anything…you have to make the environment work for you’ [AL,NA,m]
- ‘I think the role of the head of department is to set up a situation where it’s okay for people to do research and talk about it. If you can get that atmosphere going, most other things will follow from it’ [AL,UK,m]
- ‘It’s to do with me hanging out in my office and being able to chat to people when needed, but they chat to each other and we have meetings where we talk about shared issues…it’s that kind of community which is absolutely paramount…for making any kind of apprenticeship work in academia…There are lots of conversations going on and I think that gets picked up by people and we’re proud of that environment…So this is not just about mentoring other people, this is about me feeling part of a bigger thing which has such enormous potential’ [AL,RW,m]

Experts with senior administrative responsibilities were able to see the opportunities that were available to create the research environment they felt to be needed.

- ‘I see this activity of changing one’s environment as a *Go!* game, as opposed to a chess game, which most people think of it as….With *Go!*, you try to build up a stable structure so you can change the environment in such a way that it becomes self-sustaining. And for me that means bringing in new ways of doing things and getting as many people invested in that new way of doing things—in such a way that it can never be undone without tremendous effort on some bad person’s part…If good decisions are made, write them down and put them where they’re accessible, so people don’t forget them, and they don’t just get thrown away’ [AL,NA,m]

8.3.4 Learning through teaching

The relationship between learning and teaching or mentoring turns out to be a close one, for at least two reasons. One is that, for at least some aspects of expertise, teaching others seems to be an effective way of learning. Another—rather more prosaic—is that teaching, supervising and mentoring are normally requirements of researchers by mid-career in any case. So finding a way to deploy those activities in a manner that enhances, rather than diminishes, one’s own learning is desirable. It follows that deliberately seeking out situations in which teaching and mentoring become the impetus for learning expert skills could be a way to accelerate the development of those skills (as suggested in Section 4.2).

- ‘More of what I do directly or indirectly involves helping people, mentoring people, motivating people...to do research and engage with policy, press and all that sort of stuff. When I started off my academic career there was a lot less of that for me’ [BM,UK,m]
- ‘We had the idea that we would team-teach so that there would always be two of us in the room. And because it was going to be an interdisciplinary degree we would teach each other’s expertise in front of the expert. Well, it was one of the most terrifying

things I've ever done…but it was a very good grounding for me in learning about interdisciplinarity' [OS,UK,f]

- 'It's things you learn from teaching them to others' [AL,UK,f]
- 'The other thing that really helped was teaching research methods, 'cause it just forces you to be very clear and present [information] to others...You're selecting work to illustrate the methods and you're evaluating it with your students, so that means you need to work towards that deeper understanding where you can evaluate something' [AL,UK,f]
- 'When I look back over my career I realize that a lot of my learning came through having to write about what I was reading…Whenever I teach a new course my immediate goal is to write a book that covers the ideas in that course...I find that through having to write I need to clarify my ideas, and that sends me back to critical reading and thinking about what I have read' [AL,RW,m]

8.3.5 Coaching or self-coaching

Those with experience and pedagogic expertise in a domain can help individuals incrementally to stretch their performance beyond their current capabilities through designing a series of practice tasks, and giving formative feedback. Individuals may actively seek out such experts. They may also learn to coach themselves through planning realistically achievable 'stretch' tasks, and monitoring and adjusting their own performance.

> …more-accomplished individuals in the domain, such as professional coaches and teachers, will always play an essential role in guiding the sequencing of practice activities for future experts in a safe and effective manner. Research on self-regulated learning…has documented effective study methods that are related to superior academic performance, especially in high schools.
> (Ericsson 2006a: 698-699)

In recent years, the term 'coaching' has developed a plethora of meanings, from peer-to-peer discussion, through enabling, to full mentoring. The terminology is secondary, but it is useful to keep in mind the different types of impact that various kinds of 'coaching' might have.

Sports coaching

In this tradition, expertise is developed through one-to-one advice from someone who essentially manages aspects of the training regime, leaving the sportsman or woman to concentrate on the core activity. A coach, normally a previous high-performer in the same sport, gives feedback, encouragement, criticism and support, always directed towards integrating different elements of successful performance.

In the social science research context, this level of support is perhaps seen only at the research student stage, and would probably seem excessive in mid-career. One reason may be that by mid-career, researchers are already supporting their own students and

perhaps even junior colleagues, and so have developed the skills required for managing their own complex agenda of work.

Peer coaching

Increasingly favoured in university contexts, as a resource-light way to provide mutual support, peer-to-peer coaching is well-established as a means of promoting post-intervention learning transfer. It is a formal, episodic process over a specific time period. Two (or more) participants in the same training or other learning support intervention take turns to provide non-directive and confidential feedback. The purpose is to facilitate, by monitoring and feedback, the development of each person's reflective evaluation of his or her own efforts to integrate and consolidate learning.

At mid-career level peer coaching can be effective, in that colleagues may have different knowledge and skills and be able to share them to mutual benefit. However, with neither party carrying an authoritative role or a higher level of skill and knowledge, peer coaching does not extend to the provision of authoritative advice.

Life coaching

This is a facilitative support contract, for a limited period, aimed at assisting clients to find their own way towards some personal goal. By providing structure but no direct advice, the coach creates a context in which clients can identify what they want, figure out how to get it, and take the necessary steps. The coach helps the client reflect on the process, and provides encouragement and impetus. Crucially, the coach does not need to have any specialist knowledge of the client's focal activity.

In the academic context, much can be achieved by simply providing encouragement and structure. For many mid-career researchers, already aware of what they need to do, and how to do it, a general coaching approach may be sufficient. However, whereas in life coaching it can be argued that any destination is legitimate if it is the one favoured by the client, in academia, there are specific routes to expertise. So someone aspiring to extend their learning may need specific advice and guidance in what to aim for and how to achieve it.

Mentoring

This is the most commonly used form of one-to-one support in academia, both formally and informally. Typically, a more experienced person (the mentor) assists a less experienced person (the mentee) in developing specific skills, knowledge and dispositions that will enhance the latter's professional and personal growth. Mentoring combines a concern to improve current practice with an orientation towards longer term professional and career goals. The mentor-mentee relationship is hierarchical, the greater experience of the mentors providing grounds for offering non-directive guidance and even directive instruction, and possibly for acting as a role model.

Mentoring can provide a safe environment for development. It is time consuming, however, and tends to become less available beyond the early career stage. Mid-career

academics may find it difficult to articulate to a mentor what they need to know. Meanwhile, mentors are rarely trained, and may struggle to navigate the path between patronage and support. It is common, and useful, for mentors to introduce junior colleagues to their influential circle, and highlight new opportunities. But there is a risk of mentors undermining the independence of their protégés, by advising and directing, rather than supporting them towards a self-found solution or pathway.

Research coaching

This is a blend of life coaching and mentoring that combines the benefits of both. A facilitative approach drawn from coaching is combined with the guidance and advice made possible by the relevant expertise of a mentor. A research coach needs to be an experienced academic expert who has the self-awareness and discipline to provide other-centred support. For more on research coaching and other aspects of the discussion on accelerating expertise learning, see Wray & Wallace (2011).

8.4 Opportunity costs

Working in an academic research environment repeatedly throws up interesting new possibilities that can extend expert thinking ability (e.g. theoretical ideas, novel empirical questions, methodological advances, research collaboration and publishing invitations, chances to engage with practitioners). But every opportunity carries costs—especially in terms of time. Every new avenue explored comes at the expense of consolidating extant work. The more diverse the different avenues that might be pursued, the more time it will take to become familiar with the literature, and the greater the risk that these explorations fail to contribute to an overall trajectory of expertise, including expert thinking, within a domain. On the other hand, research expertise is built on novelty. New avenues offer greatest potential for innovatory thinking and big breakthroughs.

Research activity is carried out in the context of everything else going on for researchers and those around them (e.g. teaching commitments, administrative duties, research assessment, career aspirations, family life, leisure interests). These contextual factors may impinge on the amount of 'quality time' available for development.

Part of being streetwise is to understand the realities of operating in a context in which there is not enough time to do everything that might be worth doing, and learning how to make the best choices. It entails the imagination to anticipate possible future opportunities, so that they can be accommodated if they arise, and to count the possible cost of closing off potential chances. Within research, the dual demands of innovation and depth of knowledge require consideration of the best balance between following emerging interests and maintaining a coherent research trajectory.

8.5 Ways of accelerating one's own learning towards greater expertise

The following is a list that we have used as a focus for discussion and reflection towards the end of the workshop. Presented under the heading 'Things you can do', it is a useful feeder into the planning activity (Section 9.1.3). One approach is for the trainer to illustrate each of the points below using one or more of the quotes earlier in this section.

Working with others

- Co-author with someone more experienced, if it will help
- Develop 'interactional expertise'—the capacity to talk and think about knowledge and skills outside your own boundaries, in a way that specialists recognize
- Listen to others' points of view; create new jointly constructed knowledge

Working alone

- Extend your comfort zone (knowledge, methods, skills)
- Write and talk ideas through, to help you think better
- Target a tougher journal; write (more) grant proposals
- Use reviewer feedback effectively
- Have fun

Combining responsibilities

- Use your teaching and supervision to extend your own learning
- Use your admin roles to improve the research environment for everyone

References

Chase, W. and Simon, H. (1973) Perception in chess. *Cognitive Psychology* 4: 55-81

Chi, M., Glaser, R. and Rees, E. (1982). Expertise in problem-solving. In Stemberg, R. (ed.) *Advances in the Psychology of Human Intelligence,* Vol. 1, Hillsdale, NJ: Erlbaum, pp.7-75

Collins, H. (2007) A new programme of research? *Studies in the History and Philosophy of Science* 37: 615-620

Dreyfus, H. and Dreyfus, S. (2005) Peripheral vision: expertise in real world contexts. *Organization Studies* 26, 5: 779-792

Ericsson, K.A. (2006a) The influence of experience and deliberate practice on the development of superior expert performance. In Ericsson et al, pp.683-703

Ericsson, K.A. (2006b) An introduction to Cambridge handbook of expertise and expert performance: its development, organization, and content. In Ericsson et al, pp.3-19

Ericsson, K.A., Charness, N.., Feltovich, P and Hoffman, R.. (eds) (2006) *The Cambridge Handbook of Expertise and Performance.* Cambridge: Cambridge University Press

Feltovich, P., Prietula, M., and Ericsson, K.A. (2006) Studies of expertise from psychological perspectives. In Ericsson et al, pp.41-67

Hoffman, R. (1998) How can expertise be defined? Implications of research from cognitive psychology. In Williams, R., Faulkner, W. and Fleck, J. (eds.) *Exploring Expertise.* Edinburgh: University of Edinburgh Press, pp.81-100

Ochse, R. (1990) *Before the Gates of Excellence: The Determinants of Creative Genius.* Cambridge: Cambridge University Press

Schraw, G. (2006) Knowledge: structures and process. In Alexander, P. and Winne, P. (eds.) *Handbook of Educational Psychology* (2nd edn). Mahwah, NJ: Lawrence Erlbaum Associates, pp.245-263

Shanteau, J. (1988) Psychological characteristics and strategies of expert decision-makers. *Acta Psychologica* 68: 203-215

Simon, H. and Chase, W. (1973) Skill in chess. *American Scientist*, 61: 394-403

Sosniak, L. (2006) Retrospective interviews in the study of expertise and expert performance. In Ericsson et al, pp.287-301

Wray, A. & Wallace, M. (2011) Accelerating the development of Expertise: A Step-Change in Social Science Research Capacity Building. *British Journal of Educational Studies*, 59, 3: 241-264

Wright, M. (2013) Homicide detective' intuition. *Journal of Investigative Psychology and Offender Profiling* 10: 182-199

Sample Materials

9 Workshop activities:
Individual and group tasks, discussion questions

Introduction

As sections 5 and 6 illustrate, developing the characteristics of an expert social science researcher is likely to entail a range of elements. They include opportunities for learning by experience, time and, ideally, input from others. While a workshop cannot offer all elements, activities can act as a catalyst for development. To that end, the activities suggested here focus on short, contained tasks and discussions that can have longer term benefits. In particular, they can stimulate participants to rethink their research trajectory and challenge their assumptions about the limits of what is possible and, indeed, typical in terms of mid-career experiences.

These suggestions have all been trialled and found useful, with positive feedback from participants. They are readily modifiable for specific contexts, and you can also think up other activities and try them out, so as to assemble the most effective sets for particular groups of mid-career researchers.

An easily-customized electronic file of a sample handout for a multidisciplinary four-session workshop is available from Mike Wallace on request (see Section 10).

9.1 Individual tasks

A key element of short interventions is encouraging participants to ask the right questions of themselves. Typically, mid-career researchers feel compromised to some extent by various factors. These factors may include the intensification of other aspects of the job, home life pressures, the absence of specific advice and support, and personal limitations—perhaps a loss of focus, no new ideas, or the lack of necessary knowledge or skills. Some may simply have lost confidence as a result of setbacks, such as rejected papers or funding proposals, or being denied a request for research leave.

Any these factors can influence how individuals engage with a workshop intended to support them their professional development (see Section 1), and managing a group in which many may feel insecure, anxious or defensive needs care.

The individual tasks create opportunities for reflection and the identification of both concerns and successes, and offer scope for making positive plans. In our experience, the quotes from the expert informants are very useful in reassuring participants that even very successful researchers still face difficult challenges—whether feeling upset by rejections and negative reviews of their work, or struggling to manage all the parts of a complex job. On the feedback sheets at the end of our workshops, the single most frequent comment was paticipants' relief at discovering that it is possible to experience these difficulties *and* be an expert researcher.

9.1.1 Individual review: Taking stock of research expertise in your own experience [Exercise 1 in the sample handout]

We have successfully used this review early on in the workshop day or half-day, issued on a handout for individual completion (10-15 minutes).

Participants are asked to respond honestly, retaining a positive stance towards themselves, but also noting where there is room for growth. They are told that they will not be asked to share the information.

Research expertise

a) What constitutes research expertise in your area of enquiry? (e.g. think of someone you consider an expert. What are the characteristics that make them so?).

b) Where are you along the pathway to acquiring extensive research expertise?

c) List up to three aspects of research expertise that you have already acquired to a significant extent.

d) List up to three aspects that you believe you still need to develop further.

The learning process

e) Identify one peak learning experience or turning point in your development as a researcher so far—why was it so powerful?

f) Your facilitators and inhibitors.

Some key factors that can help or hinder mid-career researchers in developing their research expertise are listed below. Many could be either facilitative or inhibitive for you. For each factor, indicate in the second column whether it is, for you, a facilitator (**F**), inhibitor (**I**), both (**B**), neither (**N**). This relates to how the factor supports or impedes your ability to do good quality research

Indicate in the *third column* where the impact of this factor on your development as a researcher has significant impact on you (**S**), minor impact (**M**). (Leave it **blank** if the first column has **N**).

Use the comments column for ideas about converting inhibitors into facilitators, or for other notes.

Factor	F, I, B, N	S, M	Comments
Teaching and marking, including preparation			
Postgraduate supervision			
Administrative responsibilities unrelated to research			
Administrative responsibilities creating chances to discuss research			
Email communication with others			
Quality of research facilities			
Presence or absence of like-minded colleagues			
The many different aspects of the job			
Amount of time available			
Working environment (noise, interruptions, spaces, etc)			
Invitations to write research-based publications			
Pressure and deadlines			
Peer review feedback			
How others do their own job (e.g. supporting or creating work for you)			
Funding			
Health and fitness			
Commuting			
Life outside of work			
Personal ability to concentrate, procrastinate, etc			
Confidence			
Planning and strategy			
Level of subject knowledge			
Others' belief in you			

Do you see any patterns?

Are there any global changes that could have positive impact on how these factors affect you?

An important benefit of using this self-diagnostic tool early on in the workshop is to signal to participants that many, if not most, of the factors that can make it difficult to develop research expertise are sufficiently common to be on a generic list. In this way, the exercise acknowledges the kinds of concerns they have arrived with and signals that they can be addressed. Without this exercise, the concerns are likely to be raised anyway, and potentially in a manner that makes it difficult to move participants into a more positive and creative space.

9.1.2 Reflection: Taking stock of your current opportunities for development [Exercise 2 in the sample handout]

This review is best done after some input using material from sections 7 and 8 on what research expertise is and how it can be developed (as illustrated in the sample slides). The review enables participants to pinpoint which factors identified in the research are missing from their current experience or context, and which are actually available—even if not yet exploited.

a) Do you have a research niche (area of expertise)? If not, would it work for you to have one?
b) What was the quality of the research environment in your postgraduate and early career stages?
c) What is your current research environment like? What would make it (even) better?
d) Did you have good supervision as a student? Do you have a good mentor now?
e) Have you had access to the research-related training that you need?
f) What is the balance between positive experiences (successes) and negative ones (failures) in your career so far?
g) Do you have sufficient chances to observe expert researchers in action?
h) Does your research address users' needs? If so, do you have regular contact with relevant users?
i) Do you write about your topic in monographs or textbooks and/or teach about it?
j) Do you collaborate with other researchers? Could or should you do so more?

9.1.3 Planning your personal strategy [Exercise 3 in the sample handout]

This exercise is intended to be done close to the end of the workshop. It enables participants to leave with a plan. It is of course up to them whether they follow up on it, and some consideration might be given to ways of assisting them in doing so (Section 4).

How will you accelerate the ongoing development of your research expertise?

- Your top priority goal(s) for further developing your research expertise along your desired trajectory over the *next few years*.
- Three things you could do *this week* to set things in train.
- Three things you'd like to achieve in the *next three months* or so, as steps towards your goals.
- Three things you need to prioritize in your medium-term planning, to sustain your trajectory towards enhanced research expertise over the *coming year*.

9.1.4 Reflection during the presentation

Inviting participants to reflect on the inputs in a structured way can help them assess the degree of relevance to them of the quite generic material being presented. Thus, during our input on the nature of expertise and expert thinking (Section 7), participants were invited to think about the following:

How relevant will the experiences of established expert researchers be to my own situation?

- Even observations that don't seem relevant to you could inform your own situation. (Think outside the box: that's a characteristic of expert thinking!)
- At the end, we'll be discussing which, if any, of the features mentioned is unexpected. Keep a note of your thoughts as we go through.

9.2 Group tasks

The purpose of group tasks is to use the intellectual resources of the particular set of participants in an effective way to create a collective learning situation. A challenge for trainers is to make activities as real as possible, to generate experiences potentially catalytic for development. One cannot avoid the fact that a group activity in a workshop is contained in a one-off event with no longer-term consequences for participants.

We have used collaborative research project planning as the target activity. Authentic design activities can, in principle, be developed subsequently into a research proposal. Feedback at the end of our workshops suggested that some participants were considering this. But our primary concern is to make the task real enough to be taken seriously in the training setting.

A key finding in our study was that expert researchers know how to operate at the boundaries of their knowledge. Informants frequently referred to knowing how to engage with people who had different disciplinary and methodological knowledge from them. A linked characteristic was a willingness to operate at the edges of their comfort zone. These aspects of research expertise lie at the heart of the group tasks. It doesn't really matter what the topic focus of a group task is, as long as it meets the core criteria for its purpose, namely, in challenging participants to:

- work at the edge of their substantive knowledge
- operate at the boundaries of their personal comfort zone (e.g. in relation to how they interact with others, reflect on their own responses, etc).

Topics that are optimal for some groups will not be ideal for others, because of the range of skills and knowledge that they bring to the table. Below, we develop two ideas in detail, to illustrate ways of exploiting the opportunities of particular groups. Then we give a longer list of possible topics ideas, intended to stimulate you in thinking up your own. All of the topic ideas entail jointly constructing a project that draws on participants' strengths, but the planning of which also challenges them in terms of thinking about what they and others know and know how to do.

The two tasks developed here as illustrations tackle the question of group demographics from different angles. Task 9.2.1 is a relatively 'conservative' multidisciplinary task, in the sense that it resembles the kinds of discussions that really happen in networks, e.g. when planning a major funding application. It is to develop a joint project on a topic of mutual significance that could not be undertaken from within a single discipline: *making a multifaceted contribution to improving the quality of life for older people.* The social science research experts whom we interviewed said that collaborating with researchers from other disciplines helped them develop key elements of expert thinking and practice.

The advantage of such a topic is that participants will easily see its relevance to their real world activities. A disadvantage is that if they have already participated in such discussions, they may not find it sufficiently new to be challenging.

Task 9.2.2 was designed for single-discipline groups, though it can also be used with mixed disciplines. The rationale was that in a single-discipline group, addressing a substantive topic like the quality of life for older people will generate the subset of ideas for research and interventions that are within the comfort zone of the participants. In order to create a context in which participants are more challenged, while still being able to draw on their knowledge and experience, the task is to design a project to: *investigate the processes by which mid-career researchers in your discipline(s) develop research expertise.*

The advantages of this topic are that it has hardly been researched, and that the participants at the workshop presumably have some sort of interest in it, or they would not be there. A disadvantage is that there is one discipline for which it might still be well within the comfort zone, namely education researchers. One solution would be to combine education researchers with researchers in one other discipline, and focus the project on that other discipline. This will enable the education researchers to contribute their knowledge on learning theory, while having to find out about the target discipline. Another option is to use one of the tasks listed in 9.2.3, Other group task ideas.

In 9.2.2 and the associated handout we develop the multidisciplinary version, since it is the more generic. It can be adapted for a particular discipline.

9.2.1 Multidisciplinary project planning. Example: Quality of life for older people

Part One: What they bring to the table

Participants are invited to identify their main areas of research expertise and research literacy (familiarity with ideas and methods that they do not use themselves), covering both subject area and methodological aspects. They detail this information on a grid, with space during Part Two of the task to add in a separate column anything they realize they forgot about. (The separate listing helps them reflect on whether this is an asset that they tend to overlook or undervalue.) They can also add, in a further column any knowledge or skills that they realized during the discussion it would be useful to acquire.

Part Two: Developing a design

Pooling the information about their respective expertise and skills, participants work in groups of about six members, with a broad mix of disciplinary backgrounds, to develop a multidisciplinary research project relevant to a named theme that could be carried out by the group members collectively. The theme we used was *improving the quality of life for older people* since it is both topical and sufficiently inclusive to enable all social scientists to contribute. The particular combinations of knowledge and skills in each group will

tend to result in a range of differently focused projects, which makes the plenary feedback time interesting and unlikely to be repetitive.

In order to ensure the project does not falter for the lack of some core skill or knowledge type, the group is permitted to identify the profile of one additional group member that they could recruit to complement their expertise.

A stipulation is made that no major component of the project should rely on just one person with the necessary knowledge and skills: there should be someone else in the team who has at least a receptive working knowledge (literacy) of the same areas. The purpose of this stipulation is to ensure the project does not divide up into a set of discrete single-investigator tasks, and to challenge the participants to think about their more latent knowledge and skills sets.

The groups use discussion and negotiation to develop a project.

Importantly, they are invited to observe each other's approach to the task, to see what they can learn about different styles of interacting with others.

The groups prepare a report for the feedback session that is limited to just two minutes of delivery time:

1. The project in a sentence (e.g. research question, impact aim, or whatever)
2. How you will achieve it (basic approach taken, component parts of the investigation)
3. How each of you will contribute expertise

Once all groups have reported back, the plenary discussion focuses how participants interacted and approached the task, and helps them to draw out general learning points about developing productive research collaborations.

9.2.2 Multidisciplinary or single discipline project planning [the Group Task in the sample handout]

Very little empirical research has yet been done on the development of research expertise in social science researchers (other than our own interviews). Groups are invited to design an appropriate and effective method for empirically investigating an aspect of the nature or development of research expertise in one or more of the social sciences.

Part One: The disciplines and/or fields represented

Participants are invited briefly to indicate to the others what their discipline or field is, and what sort of research methods and underlying theories are entailed.

Part Two: Developing a design

Participants are invited to consider what sorts of research questions are most valid and useful for finding out *how people learn research expertise in those disciplines/fields*, and to identify the methods most relevant to doing so.

a) What are the most interesting research questions to ask, given what they jointly agree most needs to be found out?
b) To what extent can the methods they already know about be deployed in addressing these research questions?
c) How might the set of methods and substantive knowledge areas that they have *constrain* the options they easily consider?
d) By recognizing those tendencies to constraint, can they push beyond them, to think of additional approaches that might be taken?

The task is to plan a project that draws on their existing knowledge and skills in unexpected ways. The particular combinations of knowledge and skills in each group will tend to result in a range of differently focused projects, which makes the plenary feedback time interesting and unlikely to be repetitive. Question (a) aims to direct participants towards a key feature of expert thinking, as repeatedly attested by our informants, that expert researchers first identify the questions and then work out how to answer them, rather than only selecting research questions that deploy methods and theories they are comfortable with.

Importantly, they are invited to observe each other's approach to the task, to see what they can learn about different styles of interacting with others.

The groups prepare a report for the feedback session that is limited to just five minutes of delivery time:

- A sentence summing up the project
- The core research question(s)
- The conceptual framing of the project, if any
- The data collection methods
- The nature of the data and how it will need to be analyzed
- The sorts of answers the data might offer

Once all groups have reported back, the plenary discussion focuses how participants interacted and approached the task, and helps them to draw out general learning points about developing productive research collaborations.

9.2.3 Other group task ideas

Different profiles of attendees may require different tasks, and trainers are encouraged to think creatively about what sort of task will meet the needs of the particular set of

participants. Below we offer alternatives to the topic in task 9.2.1, an alternative to 9.2.2 that could challenge single-disciplinary groups in a different way, and a broader set of additional project ideas. These ideas extent the range beyond what was tried out in our pilot workshops, but they reflect the core findings about what worked well for our participants.

Alternative topics for the interdisciplinary project in 9.2.1

- *changing attitudes to recycling*
- *improving the dietary choices of children*
- *reducing the quantity of drugs issued on prescription and not used*
- *increasing uptake of voluntary service in the community*
- *improving social cohesion in multi-ethnic communities*
- *raising the level of creative activity and achievement across society*
- *reducing the levels of reoffending by criminals after release from prison*

Alternative topics for the single disciplinary project in 9.2.2

To challenge a group in a single discipline, a task is needed that can draw them out of their normal sphere of activity to consider how their knowledge and skills might contribute to answering questions in a new domain. As an alternative to designing a project on how research expertise is developed in their discipline, these task ideas simulate the opportunities increasingly available to researchers to bid into a project with a specialist contribution. For example:

- School educationalists challenged to develop ideas for improving patient safety in medical care, using their education research knowledge and skills. They might come up with ideas such as whether medical staff are trained effectively, whether existing research into the impact of tiredness on teachers can be applied to medical staff, or how levels of literacy in sub-groups of patients might affect their capacity to follow safety protocols.
- Economists challenged to develop ideas for improving the quality of cultural heritage. They might propose to examine the impact of charging or not charging for entry to museums and galleries, the costs of preserving artefacts, or the economic consequences of electronic access to books and art works.

It will be for trainers to come up with a topic suitable for the particular set of participants. If the training is offered by a learned society, there may be some specific research collaboration opportunities or current social topics that can be used to generate a task with particular relevance to funding opportunities or the strategic development of the discipline.

Alternative tasks requiring a different design

- Managing a project that has gone wrong in some specified way (e.g. the research assistant has left for another job; one of the project directors has been taken ill).
- Redesigning a large, complex project (provide the details) that has not been funded, in order to rescue it on a smaller scale. What should be dropped or changed? How can a

three-year data collection effort be reworked as one year? How can the scope be changed to deploy only one rather than four research assistants?

- Planning dissemination events for different types of audience (academics, media, lay public, users, school students).
- Developing an impact intervention out of a particular research finding (which you provide)—that is, thinking through ways in which the research finding could make a material difference in the world, and what would be required, practically, to achieve it and demonstrate the impact with evidence. (An option is to use the ESRC 'pathways to impact' document as a framing device).
- Based on the substantive research of one of the group, plan a collaborative project that will create social impact from that research. This entails asking challenging questions about what exactly the research might offer to society, and then deploying the knowledge and skills of the group to devise a convincing, practical approach to making that change happen, and measuring the impact. For maximum effectiveness, the group should avoid using the researcher whose work has existing and clear impact potential.

9.3 Discussion questions

There are plenty of potential opportunities for both plenary and group discussion during the workshop, though they must be managed within the overall time constraints. As with all inputs, discussion early on is likely to raise some of the topics that will be covered later. So it is for you to decide on the best balance of discussion opportunities for your participant group. It may be felt that discussion is one of the most important purposes of the event, so that other elements of the input are worth reducing to accommodate it. On the other hand, it is worth avoiding discussion getting stuck on negative issues (e.g. unmanageable work demands, unsupportive colleagues), rather than ideas on for ways of working around them.

In our experience, using the individual reflection task (Section 9.1.1) early on worked well in managing the topic and the extent of early questions and comments. First, the task acknowledges many of the issues that might otherwise come up as 'but what about…?'. Second, beginning with personal reflection enables individuals to articulate privately thoughts that they might otherwise speak aloud and then regret divulging. We also found that referring to the structure of the workshop at the outset help to keep the quantity of initial questions and comments within bounds. It was made evident to participants what topics would be covered, and that there would be plenty of time for questions and comments later.

The discussion topics suggested here aim to sustain focus on a particular feature of an input or of a task, and elicit the kinds of comments and ideas that can stimulate new thoughts and perspectives.

9.3.1 Discussion in response to the main features of the input on 'what is (social science research) expertise'?

- Do any of these features surprise you—if so, why?
- Which features give you most pause for thought about the trajectory towards greater research expertise that you and others you know might experience or expect?

9.3.2 Discussion in response to 'top tips' from social science research experts

The 'top tips' that we have used in presentations, derived from the advice that our informants said they would give to a more junior colleague, are below.

- Don't give up
- Get training if you need it
- Put the hours in and do it properly
- Be streetwise about your career needs
- Be focused, but alert to new opportunities
- Create or spend time in a good research environment
- Learn to manage the trauma of reviewer feedback
- Do something interesting and important
- Put yourself out there, disseminate
- Plan for the long term
- Get a good mentor

The discussion question is:

- Which resonate most with you, and why?

9.3.3 What next?

As noted above, individual reflection is built in at key moments in the workshop, and discussion sessions need to be sensitive to the possibility that participants may not wish to voice in public some of their self-discoveries and personal plans. However, we found that participants generally valued, and did not find overly intrusive, the final request in plenary to share, in turn:

- One idea that you are thinking of following up on as a result of this workshop

Afterwards, discussion can be used to draw out patterns and, as appropriate, explore the potential for participants to stay in touch and support each other practically (e.g. email address exchange, invitations to visit each other) in order to nurture favourable conditions for further learning.

You might also wish to draw participants' attention to possibilities for supported follow-up that they can undertake for themselves or request from others, and any arrangements that you might have in place for further institutional or learned society support (see Section 4).

10 Workshop resources

Sample slides, handout, and quote bank for easy customization

A sample set of slides (a Powerpoint file) and an associated handout (aWord file) for a multidisciplinary four-session, one-day workshop have been created for use or adaptation to suit different workshop formats, participant groups, and training styles. To facilitate customizing, the slides are in black and white, with no animation, and the handout has been produced in a simple format. Note that it may be more effective to separate the handout into parts, so that the participants can remove their responses to the reflective individual exercises from view after completion, and so that participants are not distracted early in the day by later material on the handout.

A quote bank (a Word file) is also available, which contains all the quotations from the literature and the research interviews in Sections 7 and 8. Quotations may be selected and easily 'cut and pasted' into slides or other workshop materials.

These resources can be downloaded from http://www.restore.ac.uk/researchexpertise/