Theoretical and practical knowledge revisited

Professor Michael Eraut, University of Sussex

Abstract

This theoretical paper follows a series of empirical studies on professional learning in workplace settings, whose main aim has been that of finding out how best to develop potential for enhanced learning in those settings. The paper argues that:

(1) A much wider range of theories are present in professional practices, their rationales and justifications, than is usually acknowledged; and that their absence or use needs more careful attention.

(2) The sharing of practice is constrained by the significant role played by tacit theories and tacit knowledge of practices, by differences of understanding and perspective created by different prior learning trajectories and by deceptive discourses resulting from power relations in most workplaces.

(3) Reductionist representations of complex professional practices, which fail to do justice to their complexity or to recognise the significance of differences in clients and contexts, also present obstacles to professional learning.

Acceptance of these arguments suggests that different approaches to enhancing learning in the workplace will need to be considered.

My Epistemological Position

Both knowledge and learning can be examined from two perspectives, the individual and the social. These can be considered as analogous to the particle and wave theories of light. An individual perspective on knowledge and learning enables us to explore both differences in what and how people learn and differences in how they interpret what they learn. A social perspective draws attention to the social construction of knowledge and of contexts for learning, and to the wide range of cultural practices and products that provide knowledge resources for learning.

In universities knowledge is primarily associated with publication in books and journals, and subject to quality control by editors, peer review and debate. This codified knowledge is then given further status by incorporation into educational programmes, examinations and qualifications. The guardians of the codified knowledge system are the universities and publicly funded research councils, even though an increasing number of scientific publications now come from other organisations (Nowotny, Scott & Gibbons 2001). The model of knowledge creation is that of a discipline-based community knowledge base, to which individual authors and groups of co-authors add new contributions, an interesting combination of social and individual perspectives. Each publication of status has editors and referees controlling acceptance, using criteria that include recognition of previous work, originality and credible evidence and argument. Journals of a more scientific nature use the criterion of truth according to the norms of the community from which the publication draws its readership. Some people in higher education regard these criteria as
problematic, while those outside higher education are more likely to be concerned about their relevance.

*Cultural knowledge* that has not been codified, plays a key role in most work-based practices and activities. There is considerable debate about the extent to which such knowledge can be made explicit or represented in any textual form; and the evidence gathered so far suggests that its amenability to codification has been greatly exaggerated (Eraut 2000a). What does appear to be generally acknowledged is that much *uncodified cultural knowledge* is acquired informally through *participation in working practices*; and much is often so “taken for granted” that people are unaware of its influence on their behaviour. This phenomenon is much broader in scope than the implicit learning normally associated with the concept of *socialisation*. In addition to the cultural practices and discourses of different occupations, one has to consider the cultural knowledge of colleagues, suppliers and clients that permeates their beliefs and behaviours.

Whereas codified cultural knowledge is frequently discussed in terms of its truth and validity, uncoded knowledge is discussed in terms of its ownership, location and history: who uses this knowledge, where and when? Both types of knowledge may be investigated for their range of meanings, and this is where the interaction of social and individual perspectives is particularly enlightening. The theory of *situated learning* postulates that the personal meaning of a concept, principle or value is significantly influenced by the situations in which it was encountered and the situations in which it was used. Hence the personal meaning of a concept or theory is shaped by the series of contexts in which it has been used. In these days of rapid mobility, the sequence of such contexts is likely to be unique for each individual practitioner; and this may lead to them giving slightly or widely different meanings. Even codified knowledge is personalised to some extent.

I chose the terms *personal knowledge* and *capability* for the individual-centred counterpart to cultural knowledge, and defined it as “what individual persons bring to situations that enables them to think, interact and perform” (Eraut 1997, 1998). This enabled me to investigate the effects of personal knowledge without necessarily having to represent that knowledge in codified form. The rationale for this definition is that its defining feature is the use of the knowledge, not its truth. Thus I argue that personal knowledge incorporates all of the following:

- *Codified knowledge* in the form(s) in which the person uses it
- *Know-how* in the form of skills and practices
- *Personal understandings of people and situations*
- Accumulated *memories of cases* and episodic events (Eraut, 2000a, 2004e)
- *Other aspects of personal expertise, practical wisdom* and *tacit knowledge*
- *Self-knowledge, attitudes, values* and *emotions*.

The evidence of personal knowledge comes mainly from observations of performance, and this implies a *holistic* rather than *fragmented* approach to knowledge; because, unless
one stops to deliberate, the knowledge one uses is already available in an *integrated form* and ready for action.

I have introduced the term capability in addition to that of personal knowledge, because it enables me to discuss the knowledge and learning of *teams* and *organisations* as well as that of *individuals*. The four factors in Figure 1 below are defined as follows:

**Figure 1: Key aspects of workplace learning** (Eraut & Hirsh, 2007)

- **At the individual level** I define *capability* in terms of personal knowledge, i.e. what persons bring to a situation that enables them to *think, interact and perform*. At team level, I define *team capability* in slightly narrower terms as enabling a group to *interact and perform*. I would also argue that the evidence for a team’s capability has to come from *performances attributed to the team* as a whole, rather than to individuals within it, and to the *shared understandings* that create a team, rather than a group. I define *organisational capability* narrower still, limiting it to those *decisions, actions* and *understandings* that are attributed to the organisation as a whole, rather than to individuals or groups within it. In each case I would limit such attributions to *well-informed observers*, external to the entity being observed.

- **The distinction between capability and performance is that capability is normally inferred from a series of performances** and should not be judged on only one
performance, whereas every performance is context dependent. Hence performances in more complex and difficult contexts would not be expected to be as strong as those in easier contexts. This applies at all three levels.

- Learning at individual or team levels may be formal or informal, but it would be very difficult to imagine informal learning by an organisation, rather than particular members of that organisation, especially because it would be very difficult to attribute learning that was not necessarily planned or conscious.

- The context for an individual could include people, events and practices at the level of working group, department or the whole organisation; but their relative significance could vary greatly both between organisations and within organisations. In general the most significant aspects of the context for an individual will be determined by those with whom they have the most contact and those who may be the most likely to exert power over them. However, it will be the understandings of the context that matter most; and in times of rapid change those perceptions may be dangerously narrow.

The four factors are always affecting each other. Capability is obviously influenced by learning but current capability also influences the ability to learn. Capability is required by job performance but is also developed through job performance. The context in which the individual is working and learning influences how their capabilities are perceived, how they perform and how they learn. An individual can be seen as highly effective in one setting and not another. Individuals are in a dynamic relationship with their work setting being both influenced by it and being part of it themselves and through their relationship with others.

**Theoretical discourses in professional education**

A profession is better understood as an applied field than a discipline, because its rationale derives from its social purpose and not from any distinctive form of knowledge. Typically, it uses theories from a range of formal disciplines, appropriating and resituating them in its own professional contexts. Although one could argue that this process is justified only in as far as it advances the social purpose of the profession, there is little agreement among professional educators on this issue. Professions, however, are not wholly dependent on imported theories; they also create their own theories both in the academy and in their professional practices. These theories may be based on:

- Empirical research and conceptual frameworks peculiar to the applied field
- The elaboration of practitioner maxims and practical principles, or
- The preferred view or ideology of the profession.

The last two require some further explanation.
I regard *practitioner maxims* and *practical principles* as *mediating artefacts* situated at the boundary of codified and uncodified knowledge, in that the artefacts represent only a small portion of the knowledge required for performance. The majority of that knowledge is embedded in the conversations and actions that take place around those artefacts, which offer those who participate in a knowledgeable group or community of practice opportunities to learn without going through a phase involving the formal teaching and learning of codified knowledge.

Theories based on practitioner maxims may be published in “how to do it” books and are based on the cultural knowledge of practices. The key questions concern the extent to which the advice is as effective as claimed, and the conditions under which such claims cease to be valid. These questions are no different from those asked of other types of theory; but the more embedded the maxim is in the cultural practices of the profession, the more difficult it will be to abandon if the evidence fails to support it. On the other hand, if the evidence is positive, the maxim will be relocated as an academic theory created within the applied field.

The *preferred view or ideology of the profession* is normally a theoretical justification of its purposes and practices in terms of moral principles, views of society and occupational beliefs about the effectiveness of various practices. This last type of theory plays an important part in sustaining professional identity and will usually derive partly from ethical principles articulated by philosophers and partly from the cultural assumptions about the role of that profession that prevail (or used to prevail) in that particular society.

This raises the question of how all these different types of published theory are evaluated. From a practitioner perspective the key criteria are utility, effectiveness and alignment with their own perceived goals. But this process is not as simple as it appears. First there are many complex problems for which several theories from different sources are all considered relevant; so that assessing the contribution of just one of those theories may be difficult. Their utility may be confirmed but not their effectiveness. Second, a theory’s utility may depend on whether the professionals concerned have learned how to use it: and this aspect of professional learning is often a weak element in programmes of professional formation. Then thirdly, theories are often embedded in practices that may be learned without understanding their theoretical foundation. So in what sense can an embedded theory be said to be “in use”; and does it matter if practitioners are unaware of its significance? The problem is that when the context or conditions change, or integration with other types of theory is required, a more explicit consideration of embedded theories becomes necessary. That is why professions advocate critical thinking and reflection to keep personal practice under critical control, even when it cannot easily be articulated.

Theories, however, are not only derived from empirical evidence. Their other role is to help practitioners to explain, understand, and critique occupational practices and the arguments used to justify them; and to appreciate new thinking about the role of the profession and proposed new forms of practice. Theories related to the ideology of the profession are particularly important in discussions of its goals and purposes, especially
in occupations based on personal interaction with clients. But there may also be a strong tendency to construct theories of practice that are ideologically attractive but almost impossible to implement. This usually happens when professionals are urged to adopt practices that involve much greater levels of time and effort than service users and/or the public purse can possibly finance. Hence, there is a significant gap between the theories of practice taught by former practitioners, based on how they would have liked to have practised, and the activities performed by current practitioners. This contrasts with a common workplace stance, in which current practice is uncritically accepted as an inevitable reality, and any impetus towards improving the service provided by an occupation is lost. Neither provides an adequate basis for a professional career.

The nature of performance

We use the term performance in a broad sense that includes thoughts and actions that take place within a chosen performance period, and those involved in preparing for, or reflecting on, that period. The length of the period can be chosen to cover whatever timespan is appropriate for the purpose. We also decided to focus our analysis of performance around three dimensions. The first dimension covers the context(s) and conditions where the performance took place, which we later discuss in relation to the domain of competence and the use of learning trajectories. The second dimension analyses performances by either individuals or groups in terms of four distinct but interconnected elements (Eraut, 2000):

- **Assessing clients, and situations** (sometimes briefly, sometimes involving a long process of investigation), and continuing to monitor them
- **Deciding what, if any, action to take**, both immediately and over a longer period (either individually or as a member of a team)
- **Pursuing an agreed course of action**, modifying, consulting and reassessing as and when necessary
- **Meta-cognitive monitoring** by individuals and/or collective monitoring within groups of the people involved, whether agents or clients, and the general progress of the problem, project or situation.

Each of them can take many different forms according to the context, the time available and the types of technical and personal expertise being deployed. Although analytically distinct, they may be combined into an integrated performance that does not follow the simple sequence of assessment, decision and action advocated in many textbooks. Klein et al’s (1993) research into decision-making in practice showed that real life settings include many of the following characteristics:

- Problems are ill-structured
- Information is incomplete, ambiguous, or changing
- Goals are shifting, ill-defined or competing
- Decisions occur in multiple event-feedback loops
- Time constraints exist
Stakes are high
Many participants contribute to the decisions
The decision-maker must balance personal choice with organisational norms and goals (Orasanu & Connelly 1993, pp19-20).

The findings of this research provide a much more complex different picture of the decision-making process and the nature of good performance in the field:

- Experts frequently generate and evaluate a single option rather than analyse multiple options concurrently
- Experts are distinguished from novices mainly by their situation assessment abilities, not their general reasoning skills
- Because most naturalistic decision problems are ill-structured, decision makers choose an option that is good enough, though not necessarily the best (ibid p20).
- Reasoning and acting are interleaved, rather than segregated (Weick 1983).
- Instead of analysing all facets of a situation, making a decision, and then acting, it appears that in complex realistic situations people think a little, act a little, and then evaluate the outcomes and think and act some more (Connelly & Wagner 1988).

The research also demonstrates that reasoning is schema-driven rather than algorithmic; it uses processes to which the decision maker(s) have become accustomed:

"Even for problems with many novel elements, decision makers use their knowledge to organise the problem, to interpret the situation, and to define what information is valuable for solution. Some information may be selected or distorted to fit the existing schema, a potential source of error. But it also enables speedy assessment, search, selection, and interpretation of relevant information, a definite advantage when faced with information overload and time pressure. A critical feature of the schema-driven approach is that people create causal models of the situation. They try to understand the significance of events and information by inferring causal relations" (Orasanu & Connelly 1993, p18).

The implications for decision-making practice are that (1) the relationship between knowledge and decision-making is rarely simple, (2) good decision-making is critically dependent on how the decision is framed by the decision-makers in the light of their situational understanding and therefore (3) the balance is tilted more towards the personal knowledge of the decision-maker(s) and less towards any codified knowledge management system that might be available. If there is very little time, access to a knowledge management system would only be undertaken when there was a high expectation of getting a valuable pay-off very quickly.

The third dimension is the time taken, whether by choice or under constraint. This is linked to our four elements in Table 3 below, which focuses on how the time variable
affects the *mode of cognition* and/or *mode of consultation* of those concerned. The model divides the time-continuum into three columns, whose headings seek to describe the *mode of cognition* used by the performers. Hence their timescales may differ according to the way the performers work. For example, in one context *rapid/intuitive* might refer to a minute, while in another context it might include periods of up to ten minutes or even half an hour. The critical feature is that the performers have limited time to deliberate or think in any depth. The *instant/reflex* column describes routinised behaviour that, at most, is semi-conscious. The *rapid/intuitive* column indicates greater awareness of what is going on, and is often characterised by rapid decision-making within a period of continuous, semi-routinised action. Typically it involves recognition of situations by comparison with similar situations previously encountered; then responding to them with already learned procedures (Klein 1989, Eraut et al. 1995). The time available affects the degree of mismatch that is tolerated, because rejection of familiar actions based on prior experience leads to deliberative, problem-solving and hence to a more time-consuming approach. As workers become more experienced, they acquire a wider range of *precedents* and recognize them more quickly and more accurately.

**Figure 2: Interactions between Time, Mode of Cognition and Type of Process**

<table>
<thead>
<tr>
<th>Type of Process</th>
<th>Mode of Cognition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instant/Reflex</td>
</tr>
<tr>
<td><strong>Assessment of the situation</strong></td>
<td>Pattern recognition</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Decision making</strong></td>
<td>Instant response</td>
</tr>
<tr>
<td></td>
<td>Routinised actions</td>
</tr>
<tr>
<td><strong>Overt actions</strong></td>
<td>Situational awareness</td>
</tr>
</tbody>
</table>

The *deliberative / analytic* column is characterised by explicit thinking by individuals or groups, possibly accompanied by consultation with others. It often involves the conscious use of different types of prior knowledge, and their application to new situations. These areas of knowledge may either be used in accustomed ways, sometimes with adaptation, or combined in novel ways that require a significant period of problem solving.
The *relationship between time and cognition* is probably interactive: shortage of time forces people to adopt a more intuitive approach, while the intuitive routines developed by experience enable people to do things more quickly. Crowded contexts also force people to be more selective with their attention and to process their incoming information more rapidly. Even when a group has some time for discussion, individual members may feel that their contributions have to be short and rapid. Hence meta-processes are limited to implicit monitoring and short, reactive reflections. But as more time becomes available, the role of meta-processes becomes more complex, expanding beyond self-awareness and monitoring to include the framing of problems, thinking about the deliberative process itself and how it is being handled, searching for relevant knowledge, introducing value considerations, etc.

Even when there is no emergency, experienced people typically prefer to do many things quickly and smoothly if they are confident in their own proficiency. However, there are also situations where speed beyond what even proficient workers consider to be appropriate is forced by pressure for productivity. Then quality falls, the level of risk is higher and job satisfaction plummets. Both the development of proficiency and learning to cope with pressures for rapid action involve *routinisation* and further work; but whereas the routines associated with proficiency lead to improvement in both quality and productivity, coping routines increase productivity at the expense of quality. In either case, routinisation leads to knowledge becoming less explicit and less easily shared with others, i.e. more tacit. Tacit knowledge of this kind is also likely to lose value over time because circumstances change, new practices develop and people start to abbreviate routines without being aware that they are reducing their effectiveness.

The greatest benefit of routinisation is that it reduces workers’ *cognitive load*, and thus enables them to give more attention to monitoring the situation or communicating with clients and colleagues, hence becoming both more productive and more effective. We would not survive for long if we could not take for granted many aspects of what we see and do. Not everyone, however, takes the opportunity to take a more evaluative perspective on their practice; and in many cases it is difficult to sufficiently disentangle routines from the practice in which they are embedded to either try to describe them or evaluate them. Indeed both description and evaluation threaten to diminish the utility of routines, which depends on trusting them and not having to think about them. The exception to this is when routines do not derive from increased proficiency but from *coping mechanisms* developed for handling work overload with little regard for quality.

The corresponding disadvantage is *inflexibility*. Routines are very difficult to change, not only because this would imply a negative evaluation of the previous practice but also because such change involves a period of *disorientation* while old routines are gradually unlearned and new routines are gradually developed. During this period practitioners feel like novices without having the excuses or discounts on performance normally accorded to novices. The pain of change lies in the loss of control over one’s own practice, when one’s tacit knowledge ceases to provide the necessary support and the emotional turmoil
is reducing one’s motivation. Hence the need for time and support is an order of magnitude greater than that normally provided (Eraut 2004c).

**The tacit dimension of performance**

Diagrams depicting the transformation of tacit knowledge into explicit, codifiable knowledge have been commonplace from Kolb through expert systems and evidence-based practice to Nonaka & Takeuchi (1995) and the cult of knowledge management. Sometimes there are useful by-products, but the main outcome for those who look at the evidence and are not seduced by wishful thinking is greater awareness of the pervasive presence of tacit knowledge in the way we do our business and live our daily lives (Eraut 2000a, 2004a). Since many modes of learning rely on their ability to transfer tacit knowledge without making it explicit, this section has been added to explore how tacit knowledge contributes to the four elements of performance discussed above: understanding situations, decision-making, skilful action and monitoring.

We start with the role of tacit knowledge in **understanding people and situations**, because people easily recognise this phenomenon. Getting to know other people typically involves the absorption of a great deal of incidental information, acquired by being a participant observer on occasions when we were both were present and partly by the normal conventions of politeness and sociability. While some of the knowledge gained may be explicit biodata, much will be gathered in the form of impressions of their character and behaviour or memories of episodes in which they participated. Secondary as well as primary data may also take the form of stories about a person as well as hard facts. Stories would normally be regarded as an explicit form of communication, but often they also carry implicit cultural and personal knowledge. Typically you learn more about the people you meet than you are able to explain, and some of that knowledge may be so provisional that you are reluctant to make it explicit. Yet you still take that knowledge into account when you interact with that person, because you are unlikely to stop and think unless there is something problematic about the occasion. What influences your behaviour is your aggregated knowledge of that person and that aggregation is usually a largely tacit process to which memories of incidents, encounters and episodes contribute in ways you cannot tell.

Another factor is the way you tend to organise your knowledge of people: this affects how you perceive their behaviour as well as how you structure your memories of them; and neither is a fully conscious process. There is evidence that people use particular personal constructs for categorising others, that early impressions affect later interactions and that you notice people’s actions in groups only when they play a significant part. Moreover, if you are a manager, your memories of occasions when you interacted with those you manage are bound to be an atypical sample just because you were present.

Many of the same factors contribute to the mixture of tacit and explicit knowledge which constitutes one’s knowledge of an organisation, context or situation. Many situations, for example, are largely characterised by the differing perspectives of the participants and of ‘significant others’ off-stage; and knowledge of these perspectives depends not only on
what people do and say but also on how it is interpreted by others in the context of what they already ‘know’ about the people concerned. We also use terms like acculturation or socialisation to describe the often unconscious absorption of norms, values and other kinds of culturally embedded knowledge. Also significant is the amount of tacit generalisation which takes place from familiar people, situations and contexts which you think you know to those that are less familiar. All these processes are well documented in the psychological literature. Thus tacit understanding not only contributes to relationships and situational understandings within an organisation but to important transactions with external clients, customers, suppliers and stakeholders.

*Skills* are defined in terms of knowing how to do things; and nobody will accept evidence of a skill in the form of codified knowledge. For that reason, many skills are regarded as archetypal examples of tacit knowledge. For example, riding a bicycle or swimming are easily recognised skills which can be explicitly demonstrated; but nobody can explain to you how they do it, at least not in a way that would enable you to do it yourself. Skills of this kind cannot be disseminated by the use of a knowledge management system. Indeed, many important work processes involve a combination of propositional knowledge and skills of many kinds. These components are highly integrated and interdependent. Thus a person’s negotiating skill will affect the way in which they use their propositional knowledge and even the choice of that knowledge. The technician trouble-shooting a piece of electronic equipment will draw on propositional knowledge in a personal form which suggests something about the likely nature of the problem. Designing a knowledge management system which can cater for such individual needs regarding the type and form of information could be difficult. To learn to trouble-shoot a piece of equipment within a short period of time is probably best accomplished by going out with an expert with a varied caseload but enough time to talk, show what they are doing and explain it on-the-spot. Even this, however, may not always be successful because trouble-shooting is often an intuitive skill by which people recognise patterns without being fully aware of the cues which prompted that recognition. Another example would be interpreting what is going on beneath the surface of a business meeting. Simple well-defined situations might be analysed explicitly, but complex situations would be immensely difficult to portray or interpret.

In the previous section, we discussed the tacit nature of rapid intuitive *decision-making* in terms of situational recognition and prior experience. The research into naturalistic decision-making in less time-pressured situations, which allow at least some deliberation, suggests a pattern which relies more on the intuitive use of tacit knowledge when situations become more complex and uncertain. Our first three examples concern deciding what to say and how (1) when asked for advice, (2) when giving feedback and (3) when being cross-examined in a meeting. Your awareness of the interests and priorities of those being addressed, of the emotional dimension, and of the appropriate length of your response may guide any preparation; and you hope to reach a point where you feel that you have got it right, or when you need to adjust your plan because it does not seem to be having the desired effect.

A similar problem often occurs in recruitment, especially for one-off jobs, because:
Some criteria are used for inclusion and some for exclusion, and an overemphasis on exclusion leads to ‘safe’ but uninspiring choices. The relative importance of the criteria is disputed. The application of criteria involves a lot of distinct partial judgments, which never quite add up to a final decision.

Such judgments are essentially holistic. Hence, while the discussions about candidates meeting the criteria prepare the way, the final judgment in the absence of strong micro-politics will be based on tacit judgment and at least some mutual trust.

This is but one example of decisions in situations where there is ‘no right answer’, even after a considerable period of deliberation and analysis. The problem is rarely confined to analysing probable consequences, because conflicting interests and different timescales may also need to be taken into account. The group of decision-makers explore and discuss the options, then eventually decide on one which seems to them to be ‘the best fit’. This final decision will often be largely intuitive, drawing on the tacit aggregation of knowledge which could only be analysed piecemeal. When there is less time or motivation to collect evidence and to construct and clarify arguments, such decisions will have an even greater tacit component. When there is less time still, they will be described as ‘backing a hunch’.

A great deal of monitoring also involves tacit knowledge. The first issue concerns finding space for monitoring: how do you give any attention to self-monitoring, when there are many apparently more urgent things demanding your attention; and how do you set up, or take advantage of, informal meetings to pursue your monitoring agenda with others. The second relates to what you notice during conversations or observations. Whether you rely on spotting problems or more systematically scanning your environment, you still have to notice any relevant evidence; and this is particularly difficult if it is not very salient and rarely appears. Then thirdly, you may also have to decide, often very quickly, whether or not to ignore, make a note for later consideration or make a rapid intervention. More explicit monitoring is only likely when based on previous mistakes, and even then it may have a short half-life.

**Transfer of knowledge between contexts**

Our definition of knowledge transfer is ‘the learning process involved when a person learns to use previously acquired knowledge / skills / competence / expertise in a new situation’. This process may be quite simple if the new situation is very similar to some of those previously encountered; but it is likely to be long and very challenging if the new situation is complex and unfamiliar. In more complex situations the transfer process typically involves five inter-related stages:

1. The extraction of potentially relevant knowledge from the context(s) of its acquisition and previous use;
2. Understanding the new situation, a process that often depends on informal
social learning;
3) Recognising what knowledge and skills are relevant;
4) Transforming them to fit the new situation;
5) Integrating them with other knowledge and skills in order to think / act / communicate in the new situation (Eraut, 2004d).

None of these stages are simple and, although they are in a logical order there is usually a lot of interaction between them.

Salomon and Perkins (1998) made a distinction between forward-reaching and backward-reaching kinds of transfer. The forward-reaching approach anticipates that certain kinds of knowledge will be useful in the future, and is most likely to occur in education and training contexts. Nearly all the taught components of professional and vocational education are intended for future use at work; but the evidence that this happens as intended is often disappointing. Backward-reaching transfer is required when one faces a new situation and deliberately searches for relevant knowledge already acquired. This is very likely to occur with knowledge previously used in fairly similar contexts, when its relevance is quickly recognized; but committing time to searching for previously taught knowledge is rare unless someone has a memory trace that they can follow up quickly. The discourse and culture of the workplace are so different from most education and training environments that persistent searching for what is perceived as past knowledge is very unusual. A major reason for this lack of commitment to exploring knowledge from one’s past is a general failure to understand that transfer is a learning process, which often requires a lot more time than most people expect.

When transfer is from initial qualification programmes in Higher or Further Education, the learning problem is exacerbated by the difference between the forward transfer discourse of higher education and the backward transfer approach expected in the workplace. Formal education tends to assume that simple recognition of what it teaches is all that is needed; so it attends mainly to stage 1, even though perhaps half of its students fail to transfer knowledge from one HE course to another. It may give some attention to stage 3 if students are asking for it, but not in any systematic way. Employers may give some attention to stage (3), but take stage (2) for granted, when they argue that knowledge from higher education should be “ready to use”. Thus both cultures not only ignore the very considerable challenges of stages (4) and (5) but deny their very existence! This failure to recognise the nature of the further learning required to make education more useful can only be described as disastrous.

The problem that remains is that of how best to help those who have learned knowledge appropriate for their field of work to use that knowledge in a range of potentially relevant situations. Before they start they need first to establish which areas of knowledge are relevant to a particular case or situation, second to focus more precisely on what knowledge is needed for a particular investigation, decision or action, then finally to ascertain how that knowledge is interpreted in a manner appropriate to each particular situation and context.
Establishing which areas of knowledge are relevant is not as simple as it seems. When teachers in education settings spend time discussing how the knowledge they teach relates to practice, a large collection of potentially relevant knowledge can be quickly assembled. But who uses which parts of it, why and when? There is a marked contrast between the very large number of knowledge areas deemed relevant by those who teach them and the very limited number of knowledge areas that can be taken into account at any one time. The workers concerned have to assess the priority to be accorded to each particular area of knowledge in each particular situation; but in practice patterns of attention will soon be developed and only some knowledge areas will even be considered. The greatest difficulty at this stage is for experienced workers to recognize knowledge which is embedded in their practice but no longer explicitly discussed. Recognising what knowledge one needs in any particular situation is mainly learned through participation in practice and getting feedback on your actions; and many aspects of one’s knowledge repertoire remain dormant until triggered by a very specific aspect of the situation.

Occupational qualifications are no longer considered as qualifications for a lifetime, nor are they regarded as preparation for only one or two years of work. The knowledge resources that qualifiers take with them into the workplace have to last longer than that; so they must relate to a reasonable range of jobs, roles and workplaces. However, most of these knowledge resources will not become useful until they have been further transferred and resituated in one or more working contexts. Hence knowledge perceived as irrelevant in the workplace may not necessarily be irrelevant; those who still possess it may not yet have learned how to use it in a new context. With these considerations in mind, the selection of content and modes of learning for programmes intended to provide knowledge resources for a particular occupation should be conducted with great care, and the reasons for the selection should be public and subject to review.

Learning in education or training settings cannot be substituted for learning in workplace settings. Practice components of programmes have to be authentic. However, learning to practice and learning to use knowledge acquired in education settings do not happen automatically. The conclusions we can draw from the above discussion are that:

- Learning to use formal knowledge in practical situations is a major learning challenge in its own right – it is not a natural consequence of learning knowledge on its own and practice independently of any critical questioning of its appropriateness and effectiveness.
- Such learning requires both time and support. Learning programmes rarely allocate any time to this form of learning, but just assume (wrongly) that it will occur spontaneously.
- Not only has little thought been given to the kind of support needed for this kind of learning, but there is rarely any clarity about who is responsible for providing it. (Eraut & Hirsh)
Transfer of knowledge between people

Workplaces are rarely homogenous. Even within a single occupation, there is likely to be a considerable diversity of background, experience and opinion. Workers’ past experiences of family, community, education and other work contexts will influence their current practice, discourse and identity; but their current expression of these attributes will also depend on their current participation and positioning in workplace relationships and working practices. Moreover, individual capabilities within more complex or varied areas of work will have different profiles as workers with different aptitudes, personalities and opportunities become more proficient in some areas than others and relate better with some colleagues and clients than others. Some are more gregarious than others, some are more confident, some are more ambitious.

Discourse about work covers not only individual or co-operative practices and the allocation of tasks and duties but also discussions with colleagues and possibly also with customers, clients or suppliers. Such discourse serves several different functions: seeking or communicating information, seeking or providing practical or emotional support, developing relationships with colleagues and clients, preserving one’s autonomy, restraining or expressing one’s feelings, etc. It also varies greatly with the setting: one-to-one, small group or semi-public; whether or not one is doing other things at the same time; the time available; and the level of mutual trust between the participants.

Useful exchanges of knowledge and information are sometimes the main purpose of the discourse, but sometimes only a by-product. They are never free from the wider context of inter-personal relationships, close or distant, positive or negative; and are unlikely to be interpreted only at face value. Two very practical problems are the time it takes to establish the relationships of trust that are so important for mutual learning, and the setbacks caused by changes in the membership of working groups. In the absence of any existing workplace relationships, newcomers seeking help or information are most likely to approach people of similar status or people with limited power.

It is important to recognise that, when one takes into account practitioners’ possibly negative perceptions of their workplace climate, its micro-politics and its readiness to engage in mutual criticism, there may be good reasons why they do not want to communicate more information about their practice than is essential. The art of discourse about practice then becomes one of establishing affinity with colleagues through work-related discourse and giving the appearance of being generally cooperative, without giving anything away that might increase one’s vulnerability.

“Learning to talk to clients or colleagues or managers may be at best a semi-conscious process, during which the latent functions of the discourse are not revealed and may even remain hidden from the participants. For example, the manifest function of discourse could be to consult and inform clients, to keep colleagues aware of your actions and to render account of your actions to managers. The latent function may be to keep clients happy while asserting the professional role, to maintain good relations with colleagues while preserving freedom from their influence, and to tell managers what they want to
hear while keeping them off your back. To serve the manifest function will often require congruence between what is said and what is done; but this may constrain the latent function” (Eraut 2000).

Although presented in individual terms, such discourse is primarily a social characteristic of many workplaces, into which newcomers are rapidly socialised. In many settings discourse helps workers:

- To provide a defensible account rather than a description of their actions
- To create an impression of control over situations which inspires confidence in themselves and other people
- To preserve personal autonomy of action.

Two undesirable consequences of this discourse are that:

- Uncertainty and risk-taking are disguised rather than shared
- Overt sharing of information serves to sustain a power-sharing equilibrium rather than communicate useful knowledge.

This discourse is often taken for granted rather than consciously developed and sustained; and, unlike explicit training discourse, it is strong on collective protection but vague on substantive content.

For all the above reasons, one should expect to find variations in the practices of individual practitioners in the same workplace, which are not always reflected in their discourse about those practices. Moreover, because that discourse serves many purposes other than the exchange of information about practice, we should not assume that practices and the discourse about those practices are well aligned. What is said and not said about practice may tell us more about relationships at work than about practice.

Another important factor affecting such discourse is the role of tacit knowledge in many areas of professional practice. This limits what people are able to say, as well as what they choose to say, though the two are not unconnected. While pattern recognition and routinised actions are features of tacit knowledge often associated with individual experiences, the possibilities for deeper conceptualisation of practice that might lead to the ability to discuss them more explicitly are constrained by the absence of any discourse that might trigger reflection or enable any productive discussion. Thus tacit knowledge and deceptive discourse are two, mutually reinforcing, influences on workplace culture.

Given the many challenges described above, let us now explore the possibilities for sharing practice, whilst recognising that these will depend on relationships, local discourse and culture, and the aspects of practice accorded prime attention. One immediate problem is that positive relationships and useful discourse take time to develop. Possible starting points include coaching each other on areas of skill where their
experience is unequal, and sharing opinions on difficult cases. In the latter option there is the possibility of consulting further people if they disagree, or if both practitioners feel uncertain about the best course of action. Indeed, developing the habit of discussing issues with a “buddy” before consulting a manager or supervisor is an excellent way of fostering good relations, learning to frame problems for consultation and constructing a more communicative common discourse. This should gradually develop the ability to consult more widely, enhance the disposition to consult and expand the circle of workers with strong mutual relationships.

Another strength of working as a pair is that mutual observations of each other’s interactions with colleagues, customers or clients will communicate much more about their practices than could be revealed in any discussion. As mutual communication becomes more effective, exchanges about clients may become more informative; and it becomes possible to pass on less clearly substantiated concerns and hunches without being misunderstood. More detailed accounts of modes of learning in the workplace and the factors affecting them can be found in Eraut et al (2005ab) and Eraut (2007ab).

A different approach is to convene group discussions about cases, aspects of practice or even processes and systems. These are more difficult to arrange than meetings between pairs, but they are important for developing teamwork and ownership of the policies and collective practices of working groups. Many group leaders and managers lack the skills for organising such events, and genuine participation by all those present is difficult to achieve. The initial disposition towards constructive participation can be enhanced by earlier events of a purely social nature and also, we would argue, prior experience of discussing the issues with one or two close colleagues.

While it is possible for pairs of experienced colleagues to understand and learn from each other’s practice by a combination of discussions and working together, without even attempting to make their tacit knowledge more explicit, the same assumption cannot plausibly be extended to a group of practitioners with few opportunities for mutual observation. So we have to consider ways of communicating at least some tacit knowledge if important aspects of practice are to be shared. Approaches to sharing tacit knowledge that we have used or encountered in the literature include:

- Demonstrating skills with a voice-over commentary – this may not be an authentic account of normal thinking in action but can still communicate much useful tacit knowledge
- Discussing common episodes at which the participants were co-present
- Recordings of episodes, with the possible addition of a voice-over commentary (Holmstrom & Rosenqvist, 2004)
- Describing incidents or telling stories, followed by discussion (Fairbairn, 2002)
- Discussing cases and/or problems, real or fictional
- Use of mediating artefacts.
Over time, it also becomes possible to develop new vocabulary and practices for discussing expertise, and gradually to introduce concepts and theories that may help people to make more sense of their experience.

Our own interview-based research on mid-career learning in the workplace (Eraut et al 2000) found that the capability to tell was linked to people’s prior experiences of talking about what they knew; and that talking more explicitly about their knowledge at work was more likely to occur when there was:

- A climate of regular mutual consultation encouraging those consulted to describe what they know; or
- A training or mentoring relationship in which explanations were expected, sometimes of cultural or behavioural norms as well as more technical matters; or
- An informal relationship leading to work-related discussions of information out of hours, when more ‘provisional’ and ‘riskier’ comments might be made which conveyed some meaning but were not understood as pretending to be comprehensive or accurate; or
- A crisis, review or radical change in practice, which caused people to exchange opinions and experiences, sometimes also to making values more explicit.

Those experienced in facilitating the sharing of tacit knowledge are constantly surprised by the diversity of practice at the level of detail: communities of practice are rarely as homogenous as is often suggested, and the level of mutual learning is often very low. Expanding the boundaries of explicitness is possible in most situations, though not necessarily popular. However, there remain many questions about how far it can go. It appears to require considerable expertise in knowledge elicitation to capture significant aspects of tacit knowledge; and whether those aspects add value to a practice team or organisation without further knowledge that still remains tacit is a matter for empirical enquiry. Often close inspection of examples cited in the literature reveals that processes other than the conversion of tacit knowledge to explicit knowledge were involved. For example, most of the examples in Nonaka and Takeuchi (1995) appear to describe a process of making personal knowledge more public. The knowledge involved was already explicit but neither its existence nor its relevance had been recognised.

Clearly a degree of explicitness is needed not only for improving performance but also for clarifying the linkage between actions and outcomes, which underpins practice and enables one to take responsibility for one’s actions. But the constraints on making tacit knowledge explicit are formidable, and much of the discussion about it in the literature is ill-informed if not naive. The probability is that ‘thick’ tacit versions will co-exist alongside ‘thin’ explicit versions: the thick version will be what happens in practice, the thin version will be used for justification and when discussing practice or training.
The implications of this analysis for any kind of teamwork are that:

1. A climate of mutual trust, both lateral and vertical is essential for the sharing of practice
2. Even when there is trust, sharing requires time and opportunities
3. Working interdependently with others is a learning challenge, for which some external support may be needed, because close cooperation in complex situations requires that those involved have:
   - mutually developed understandings that permeate their discourse
   - mutual adaptation and collaboration in rapid response situations
   - mutual awareness of differences of perspective and expertise that broaden and deepen their problem solving capability
   - agreed processes for making decisions for which the group will be deemed responsible.

**Discourses of competence and expertise**

The formal representation of professional knowledge is highly problematic. There appear to be two competing types of discourse: those concerned with competence and competencies, and those concerned with experts and expertise. In either case there is both a holistic perspective - a competent or expert person/team - and a series of parts, the competencies or types of expertise that enable a person/team to perform some aspect of their work. Thus the term ‘expertise’ is widely used in situations where people are perceived to have some expertise but are not generally regarded as experts. Similarly, a person with some relevant competencies may not be regarded as being wholly competent in some work contexts.

**Competence** is another term, which gets used within both socio-cultural and personal perspectives. Eraut (1998) has argued that the socio-cultural definition of competence as ‘meeting other people’s expectations’ has the longer provenance in English, where the everyday meaning of ‘competent’ encompasses the following: being properly qualified, being able to perform on your own, being capable, adequate but not expert. The scope of such competence is rarely specified but is often implicit in the context. My own definition of competence is ‘being able to perform the tasks and roles required to the expected standard’. This expectation, being socially defined, will either be taken for granted or determined by the micro-politics of the particular context. Hence it is likely to vary across contexts and over time. Thus competence is a moving target; and the expected standard varies with the experience, responsibility and reputation of the person concerned. Hence, it is difficult to imagine how an individual professional’s competence could remain static.
Ideally, a professional’s competence is enhanced and expanded by further practice and new challenges. But this will depend on the affordances offered by their practice context and the disposition of individuals or groups to take advantage of them. At any one time, a professional’s competence is limited to the domain, within which their practice meets the expectations of significant others in their workplace and/or among their clients. Key aspects of this domain include:

- The contexts in which the performer will have to operate, including likely locations and their salient features
- The conditions under which the performer will have to work, e.g., degree of supervision, pressure of time, crowdedness, conflicting priorities, availability of resources
- The situations which the performer may encounter, covering such factors as client types and demands, tasks to be tackled, interpersonal events, emergencies, etc.

This complexity is incompatible with the common but simplistic assumption that competencies can be treated as binary variables, i.e. that workers are either competent or incompetent in each aspect of their performance. Moreover, there are several reasons why competence may not always be translated into performance:

- **Personal disposition**, which may be affected by both contextual norms and personal confidence in that particular context
- **Lack of capacity** due to too heavy a workload or lack of time (a common feature of many university examinations)
- The context and conditions in which the performance is situated (these may be too crowded, lack important facilities or fail to provide appropriate support).

Over time these factors can cause a person to settle for lower standards of performance, not a desirable outcome in professional work that serves the public.

Most individual-centred concepts of competence derive from the work of McClelland (1976) and his co-workers, who defined a competency as “an underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a job or situation” (Spencer & Spencer, 1993). Their method for finding the competences needed for a particular type of job was to identify two criterion samples, one of people deemed especially successful at the job and one of people deemed just good enough not to cause any concern. These groups were then engaged in Behavioural Event Interviews, in which they were asked to describe three successes and three failures and probed for details of their thoughts and actions. The transcripts of these interviews were then analysed to identify differences between the two samples. This yielded a competency model specific to a particular type of job, which comprised three to six clusters of two to five competencies, each with an associated rating scale (Boyatzis 1982). Several of these were common across quite a wide range of jobs.
My research into the professions and into competency-based qualifications in the workplace indicates real difficulties in articulating and representing the nature of competence (Eraut et al 1996, 2001). These include:

- Finding the most **appropriate level of detail**: very broad representations of competence are too vague for any practical use; and very specific representations tend to become too numerous to handle, as lists of competencies approach the size of telephone directories.
- There are similar problems with assessment to those found with even the most detailed learning objectives. Assessors rarely agree unless there is a past history of **developing a consensus** by discussing individual cases. Moreover, the half-life of such a consensus is usually very short, because personnel change and so do the expectations of significant others who influence the implicit social agreement on what counts as competence.
- Capturing the **essence of an area of expertise** is both difficult and controversial.
- Both listing **important attributes** of competence and describing their integration into performance is a part-whole problem, for which nearly all previous representations (including those in higher education) have focused only on the parts.
- Covering **all aspects of the job** is rare, because many aspects remain tacit or get explained away by terms like **experience** or **personality** which tell us very little about how people learn to do them.
- Recognising the changing and conditional nature of **what counts as competence**: this changes over time and between contexts, an approach that works well with one group may not work so well with another group.

Whereas the discourses of competence and competencies seek to be generic, and focus mainly on common aspects of practices, the discourse of experts and expertise often focus on the successful handling of individual cases and situations. The discourse on experts, in particular, suffers from the use of different criteria. Thus people may be treated as experts for one or more of the following reasons:

- **What they do**, e.g. successful handling of complex and difficult cases and situations
- **How they do it**, particularly when it involves special skills or special approaches to the representation of problems
- **What they know**, as shown by publications, specialist consultation/advisory roles, being called as expert witnesses
- **What they have achieved**, such as awards and honours awarded by peers, high-ranking professional positions at work or in learned societies.

All these are acceptable criteria for designation as experts, if they are clearly defined, but research studies using criteria such as qualifications or years of experience, simply because they provide convenient samples, are now creating considerable confusion.
The most useful contribution of the research on experts and expertise has probably been its addition to our understanding of the nature of practical knowledge (Eraut 2005)? I would like to draw attention to three issues in particular. The first issue, already discussed above, is the role of tacit knowledge and the problems it creates for those who change their workplaces or seek to learn from colleagues. New pressures for accountability to clients and stakeholders in our new audit society have led to more explicit accounts of outcomes, but these are not often expected to describe practices and are often regarded as only limited representations of the ‘true’ outcomes.

The second issue concerns the recent interest in the relational nature of expertise and the co-ordination of individual and social competencies. Hakkarainen et al (2004) persuasively argue that the research on experts and expertise has suffered from a cognitive bias. In particular:

1) “It pays too much attention to mental processes and events rather than concrete activities taking place within socio-cultural contexts and situations”.

2) “It focuses on mental representations rather than various external representations, tools and knowledge embedded in the environment that people are using to manage their limited cognitive resources”.

3) “It assumes that intellectual activity takes place at the level of the individual agent, and is primarily dependent on his or her mental capacities, rather than distributed across several agents and dependent on characteristics of their social organisation” (pp7-8).

Hakkarainen et al (2004) then go on to argue that: “If expertise is examined only at the individual level, explanation of the development of expertise becomes very difficult and mysterious” (pp8-9). Hence their recent research sought to combine evidence on “individual and social aspects of expertise, as well as more specific analysis of relations between these levels”; by focusing on networked expertise, which they define as “higher level cognitive competencies that arise in appropriate environments, from sustained collaborative efforts to solve problems and build knowledge together” (ibid p9).

The relational nature of expertise means that, in order to make a valuable contribution to the community, an agent needs “to develop their knowledge and skills in relation to their fellow actors in such a way as to allow them to complement each other’s strengths and weaknesses” (ibid p206). Hence, “moving to another community produces special challenges because the agents need to learn to adjust their activity to the knowledge and skills of others and find a ‘slot’ that allows them to develop and utilise their own expertise”

The third issue concerns the representation of knowledge, where the term network refers to concepts and idea, rather than people. Hitherto, this has been pursued mainly by cognitive scientists. The greatest progress has been made in medicine, where Boshuizen (2003) has provided an excellent summary (Figure 3) of the changes in representation
that accompany the development of expertise in doctors. Her interpretation of her own
and other people’s research is that successive modes of representation are developed as a
person’s expertise increases, and that the key advantages conferred by later modes of
representation are their lower demand on the expert’s cognitive capacity, more rapid
access to usable information and a reduced need for deliberation. The building block for
this development is the accumulation of individual cases.

Novices start by learning large chunks of biomedical knowledge, which enables them to
provide detailed descriptions of cases, but also requires lengthy multi-step reasoning.
Placements offering engagement with large numbers of cases support the gradual
development of broader, clinically based, more succinct frameworks for describing cases,
which encapsulate the biomedical knowledge and slightly reduce their cognitive load.
Then gradually they begin to develop condition-specific illness scripts, which are best
described as narratives of typical cases that remind them of the successive decisions they
make for each patient. These make a significant reduction in their cognitive load. At this
time they also begin to give special attention to atypical cases, which they remember as
separate one-off events. With more experience some of these become sufficiently familiar
to form additional scripts for well-defined problems.

**Figure 3: Knowledge structure, learning and cognitive demand in problem-solving
at subsequent stages of expertise development**

<table>
<thead>
<tr>
<th>Level of expertise</th>
<th>Knowledge structure</th>
<th>Learning</th>
<th>Problem solving</th>
<th>Control required in clinical reasoning</th>
<th>Demand on cognitive capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>novice</td>
<td>networks (incomplete and loosely linked)</td>
<td>knowledge accretion, integration and validation</td>
<td>long chains of detailed reasoning steps through networks</td>
<td>active monitoring of each reasoning step</td>
<td>high</td>
</tr>
<tr>
<td>intermediate</td>
<td>networks (closely linked)</td>
<td>encapsulation</td>
<td>Reasoning through encapsulated network</td>
<td>active monitoring of each reasoning step</td>
<td>medium</td>
</tr>
<tr>
<td>expert</td>
<td>illness scripts</td>
<td>illness script formation</td>
<td>illness script activation and instantiation</td>
<td>monitoring of level of script instantiation</td>
<td>low</td>
</tr>
<tr>
<td></td>
<td>memory traces</td>
<td>instantiated scripts</td>
<td>automatic reminding</td>
<td>check relevance</td>
<td>low</td>
</tr>
</tbody>
</table>

Figure 3, however, still focuses on learning during and soon after formal on-the-job
training. The ill-defined cases continue to be very challenging and usually cause them to
return to biomedical knowledge as a key resource. With greater experience, some of
those ill-defined problems become well-defined, while those that remain ill-defined may
require new modes of representation.

This highlights a major problem with the much cited Dreyfus model of progression from
Novice to Expert (Dreyfus & Dreyfus, 1986), which gives scant attention to the
increasing occurrence of novel and complex situations that require an overt, co-operative,
problem solving approach. Dreyfus treats progression to Expert as another step beyond
Proficiency; but I see this as mistaken. The most difficult problems are those that are ill-defined, and these cannot be tackled by the same approaches as those used by proficient workers to tackle well-defined problems. This type of expert requires a wider knowledge base, critical analysis and the ability to develop multiple representations of complex problems, as well as being able to work with clients and other practitioners with different types of expertise. The cultivation of such experts requires a very different learning context from that needed for the development of proficiency.

**Learning Trajectories**

At this point, I should note that research into expertise tends to focus on the most cognitive aspects of a person’s work, and neglect other aspects and the connections between those aspects. My own research suggests that most professionals look for feedback on all aspects of their work and advice on priorities. Hence there is a need for tracking learning over time in order to praise progress, adjust plans and seek new learning opportunities as priorities change. Hence our research has tried to find ways to combine the recognition of complexity with the principle of lifelong learning by combining selected episodes, which seek to represent complex performance, with learning trajectories that focus on the development of particular aspects of performance over time.

Our list of trajectories was developed during successive research projects on early and mid-career professional learning, which enabled us to classify our findings on what was being learned under eight main headings: task performance, role performance, awareness & understanding, personal development, academic knowledge and skills, teamwork, decision making & problem solving, and judgement.

**Table 2: A typology of learning trajectories**

<table>
<thead>
<tr>
<th><strong>Task Performance</strong></th>
<th><strong>Role Performance</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed and fluency</td>
<td>Prioritisation</td>
</tr>
<tr>
<td>Complexity of tasks and problems</td>
<td>Range of responsibility</td>
</tr>
<tr>
<td>Range of skills required</td>
<td>Supporting other people’s learning</td>
</tr>
<tr>
<td>Communication with a wide range of</td>
<td>Leadership</td>
</tr>
<tr>
<td>people</td>
<td>Accountability</td>
</tr>
<tr>
<td>Collaborative work</td>
<td>Supervisory role</td>
</tr>
<tr>
<td></td>
<td>Delegation</td>
</tr>
<tr>
<td><strong>Awareness and Understanding</strong></td>
<td>Handling ethical issues</td>
</tr>
<tr>
<td>Other people: colleagues, customers, managers, etc.</td>
<td>Coping with unexpected problems</td>
</tr>
<tr>
<td>Contexts and situations</td>
<td>Crisis management</td>
</tr>
<tr>
<td>One’s own organization</td>
<td>Keeping up-to-date</td>
</tr>
<tr>
<td>Problems and risks</td>
<td></td>
</tr>
<tr>
<td>Priorities and strategic issues</td>
<td></td>
</tr>
<tr>
<td>Value issues</td>
<td></td>
</tr>
<tr>
<td><strong>Personal Development</strong></td>
<td></td>
</tr>
<tr>
<td>Self evaluation</td>
<td></td>
</tr>
<tr>
<td>Self management</td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge of the Field</strong></td>
<td></td>
</tr>
<tr>
<td>Knowing the repertoire of practices</td>
<td></td>
</tr>
<tr>
<td>Evidence of their effectiveness in</td>
<td></td>
</tr>
<tr>
<td>particular contexts</td>
<td></td>
</tr>
<tr>
<td>Using knowledge resources and networks</td>
<td></td>
</tr>
<tr>
<td>Knowing what you need to know</td>
<td></td>
</tr>
<tr>
<td>Making practices more explicit</td>
<td></td>
</tr>
</tbody>
</table>
Handling emotions  
Building and sustaining relationships  
Disposition to attend to other perspectives  
Disposition to consult and work with others  
Disposition to learn and improve one’s practice  
Accessing relevant knowledge and expertise  
Ability to learn from experience  

**Working with Others**  
Collaborative work  
Facilitating social relations  
Joint planning and problem solving  
Ability to engage in and promote mutual learning  

Conceptual and theoretical thinking  
Use of evidence and argument  
Writing appropriate documents  

**Decision Making and Problem Solving**  
When to seek expert help  
Dealing with complexity  
Group decision making  
Problem analysis  
Formulating and evaluating options  
Managing the process within an appropriate timescale  
Decision making under pressure  

**Judgement**  
Quality of performance, output and outcomes  
Priorities  
Value issues  
Levels of risk  

Not only did the concept of learning trajectories fit our data much more closely than a set of competences (Eraut et al (2005a), but it also took into account discontinuities of learning; so that at any one time a person’s movement along any particular trajectory could be either explicit or implicit, and positive, static or even negative, according to the opportunities afforded by their practice at the time.

Another advantage is that it problematises the role of occupational qualifications as signifiers of learning. Occupational qualifications are a very public rite of passage, which symbolises generic competence in an occupation; and this claim is backed by the use of apparently clear and specific criteria for assessment. In practice, however, these qualifications require both a specified amount of practical experience and the demonstration of competence in certain aspects of performance by successful candidates. The assessment process may require either that a particular level of competence is reached in each aspect, or that the performance as a whole is satisfactory, or both. However, variations in candidates’ strengths and weaknesses are inevitable, because trainees are allocated to one or more placements, whose learning opportunities will differ in kind if not also in quality. So there are bound to be significant differences in the performance profiles of trainees at the point of qualification.

The main advantages of learning trajectories around the time of qualification are that:

1. They track aspects of trainee performance before, during and after qualification; and this should avoid the pretence that workers with the same qualification perform at a similar level across the range of occupational activities.
2. They enable continuity of learning by providing profiles of candidates’ strengths and weaknesses at the time of qualification, and at appropriate intervals thereafter, which can then be used for planning some of their further learning.
3. Mapping progress over time also measures the ability to learn from experience, which is probably a better predictor of future performance than a single mammoth period of assessment.

4. They incorporate the principles and practices of Lifelong Learning by including both formal and informal learning

One important problem remains to be solved. In the opening section of this chapter we noted that most occupational activities require that several types of knowledge are integrated into a holistic performance. How then can we reconcile the use of learning trajectories depicting changes in aspects of performance over time with recognizing the holistic nature of most kinds of performance? Returning to our earlier discussion about the domain in which performances have been judged as competent or proficient, we decided that points on our learning trajectories should be treated as windows on episodes of practice, in which (1) the aspect of learning portrayed by the trajectory had played a significant part, and (2) the current domain for the trajectory had been sustained or enhanced. This could only be achieved if each window included the following information about the performance:

- The setting in which it took place, and features of that setting that affected or might have affected the performance
- The conditions under which the performance took place, e.g., degree of supervision, pressure of time, crowdedness, conflicting priorities, availability of resources
- The antecedents to the performance and the situation that gave rise to the performance
- The other categories of expertise involved
- Any differences from previously recorded episodes
- Indicators of expertise in the domain of the trajectory having been maintained, widened or enhanced

This last point draws attention to the complexity of learning and performance in most professional, technical and managerial jobs. It is unusual for a performance to use knowledge from only one trajectory, and the seamless integration of personal knowledge from several trajectories may itself be an important learning challenge that goes beyond progress in several separate trajectories. The holistic nature of any complex performance should never be neglected. Within this overall framework it is still possible, indeed desirable, for different types of representation to be used for different trajectories and at different career stages. There is no one best way for describing complex knowledge in use.

References


Eraut M (2004b) The practice of reflection, Learning in Health and Social Care, 3 (2), pp 47-52
Eraut M (2004c) Learning to change and/or changing to learn, Learning in Health and Social Care, 3 (3), pp 111-117


Fairbairn GJ (2002) Ethics, empathy and storytelling in professional development, Learning in Health and Social Care, 1, 22-32


Holmstrom I & Rosenqvist U (2004) Interventions to support reflection and learning, Learning in Health and Social Care, 203-212


McClelland DC (1976) A Guide to Job Competency Assessment, Boston, McBer


