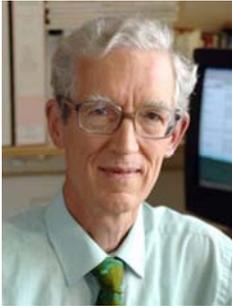


CHAPTER A2

How Professionals Learn through Work

Michael Eraut



Michael is the UK's leading researcher into how professionals learn in work place settings. His pioneering research has found that most learning occurs informally during normal working processes and that there is considerable scope for recognising and enhancing such learning. His books include the highly acclaimed 'Developing Professional Knowledge and Competence'. In 2007 he completed an ESRC-funded five year study of how professionals learn in the early part of their careers. Michael has been working with SCEPTRe to help us develop a better understanding of the way learning is enabled in professional work placements so that we can improve the way we prepare and support our students.

My proposition: Until we understand how professionals actually learn as they go about their everyday work we cannot fully comprehend what we need to do to help students for the professional environments they will work in. This is a question that has underlain the work I have undertaken while I have been working with the Surrey Centre for Excellence in Professional Training and Education (SCEPTRe). In this Chapter I will try to draw together insights I have gained through two decades of research into how professionals learn through work as a precursor to addressing the challenge of how we might improve the way in which we support students on their professional work placements. I will be talking about the main ideas in this Chapter in a series of podcasts which can be accessed from <http://learningtobeprofessional.pbworks.com/How-professionals-learn-through-work>

Introduction

Work placements provide contexts for learning of a very different kind from those provided within universities. Not only do people learn in different ways, but they also learn different things. This Chapter introduces a framework developed from research into workplace learning for describing (1) how people at work might usefully map the working knowledge they have acquired and now want to acquire, and (2) what modes of learning they might find most useful in achieving those learning goals. It also highlights features of work contexts that have been shown to enhance or limit the pursuit of those goals. However, before proceeding further, I should warn you the reader that, unlike teaching organisations, learning is not the main aim of most workplaces. Most workplace learning is informal and occurs as a by-product of engaging in work processes and activities. Newcomers often have to learn "How we do things here" without being given any specific objectives or advice. Thus a learning goal might be described by a vague phrase like "being able to do what X does". Even when more detailed advice is given, your learning will still be evaluated by the extent to which you can do what X does, rather than by some indirect and less authentic type of assessment. You may be given sets of objectives or competencies, but the 'real' assessment will be whether your performance meets the expectations of significant others in your workplace.

Although the workplace appears to be primarily concerned with your capability (what you do and how you perform), it is equally important to be able to do the right thing at the right time. In practice this means that you have (1) to understand both the general context and the specific situation you are expected to deal with, (2) to decide what needs to be done by yourself and possibly also by others, and (3) to implement what you have decided, individually or as a group, through performing a series of actions. All three of these processes contribute to your perceived

competence. Even if other people are making the decisions, you may still have to interpret their meaning in order to know precisely what is required.

Finally, I will draw attention to the tendency of the competence literature to assume that competence and/or its attributes or components are generalisable skills, when there is little evidence to support this claim. Hence it is important to give prime attention to clarifying the domain within which individuals or teams are deemed to be competent, i.e. where their practice meets the expectations of significant others in their workplace and/or among their clients. Key variables in characterizing the domain for any particular type or aspect of performance are likely to be:

- The contexts in which the performer can currently operate, including likely locations and their salient feature.
- The conditions under which the performer is able to work competently, e.g., degree of supervision, pressure of time, crowdedness, conflicting priorities, availability of resources
- The situations which the performer has handled capably, covering such factors as client types and demands, tasks to be tackled, interpersonal events, emergencies.

Progression

There are many possible types of progress in the early stages of a new job, only some of which would be relevant during any short period of time:

- Doing things faster
- Improving the quality of the process
- Improving communications around the task
- Becoming more independent and needing less supervision
- Combining tasks more effectively
- Quicker recognition of possible problems
- Expanding the range of situations in which one can perform competently
- Helping others learn to do the task or part of the task
- Increases in task difficulty/ taking on tasks of greater complexity
- Dealing with more difficult or more important cases, clients, customers, suppliers or colleagues.

Some of these types of progress could be described as *doing things better*, some as *doing things differently* and some as *doing different things*. Sometimes all three may be happening at once. Progression often involves doing the same thing, or not quite the same thing, in more difficult conditions or across a wider range of cases. Although these types of progress seem fairly obvious, they are not necessarily conscious. People recognise that they have learned things through experience, but do not necessarily remember how or when. My research projects on workplace learning often found that newcomers first recognised that they had learned something when they realised that they were doing things that they could not have done a few weeks earlier.

A key feature of being a newcomer is that of not knowing what is going on around you or what precisely is expected of you. In education contexts, new students are members of large cohorts in a similar state of ignorance; but in workplace settings, you are more likely to be the only newcomer. Even if others were recruited at the same time, you may not see them very often. The long process of getting to know your work and your workplace is well captured by the progression model developed by the Dreyfus brothers (a philosopher and a computer scientist) as an antidote to the hyper-cognitive perspective on learning developed by cognitive scientists in the late 1970s and early 1980s. Their model (Dreyfus & Dreyfus, 1986) was one of the first to emphasise informal learning from experience and the acquisition of tacit knowledge (see Table 1 below).

The early and middle stages of the model show the development of situational recognition and understanding, and of standard routines that enable one to cope with crowded busy contexts. Over time the explicit rules and guidelines so essential at the beginning gradually become superfluous, until they are eventually abandoned when simple activities become more automatic. More complex activities are subjected to deliberation at the competence stage, but may not be treated very analytically unless analysis is specifically required. Progression beyond competence is then associated with the concept of proficiency, which the Dreyfus model treats as the gradual replacement of deliberation by more tacit forms of cognition.

Table 1 Summary of Dreyfus Model of Progression (Dreyfus and Dreyfus, 1986)

Level 1	Novice Rigid adherence to taught rules or plans Little situational perception No discretionary judgement
Level 2	Advanced Beginner Guidelines for action based on attributes or aspects characteristics of situations recognisable only after some prior experience) Situational perception still limited All attributes and aspects are treated separately and given equal importance
Level 3	Competent Coping with crowdedness Now sees actions at least partially in terms of longer-term goals Conscious deliberate planning Standardised and routinised procedures
Level 4	Proficient See situations holistically rather than in terms of aspects See what is most important in a situation Perceives deviations from the normal pattern Decision-making less laboured Uses maxims for guidance, whose meaning varies according to the situation
Level 5	Expert No longer relies on rules, guidelines or maxims Intuitive grasp of situations based on deep tacit understanding Analytic approaches used only in novel situations, when problems occur or when justifying conclusions Vision of what is possible

Tacit knowledge appears in three quite different forms:

- *Situational understanding* is developed through all five stages, based largely on experience and remaining mainly tacit during its use.
- Increasingly *intuitive decision-making* involves pattern recognition and rapid responses to developing situations, based on the tacit application of tacit rules.
- *Routine procedures* are developed through to the competence stage for coping with the demands of work without suffering from information overload. Some of them are likely to have begun as explicit procedural knowledge and then become automatised and increasingly tacit through repetition, with concomitant increases in speed and productivity.

My main criticism of the Dreyfus analysis is that it is both individualistic and conservative. Regulations, accountability, value issues and the growth of teamwork have increased the need to share one's knowledge with others; and the Dreyfus Model acknowledges but gives scant attention to the increasing occurrence of novel and complex situations that require a problem solving approach involving an explicit search for relevant knowledge, the collection of further evidence and critical reasoning.

However, I support the Dreyfus progression to proficiency for two reasons:

1. The difference between being *competent* and being *proficient* is neatly captured by the old training distinction between a *trained worker* and an *experienced worker*. The experienced worker will normally be more productive, need less supervision, be more aware of contextual variations and be competent in a wider range of situations.
2. It helps to explain the benefits and constraints of tacit knowledge. In particular it enables us to better understand the difficulty of changing long established approaches to situational understanding, rapid decision making and routine practices. Such changes involve unlearning as well as relearning, a problem to which I will return a little later.

The progression to Expert is more problematic. One acknowledged type of expert is highly specialized and often caricatured as someone who knows more and more about less and less, but many experts are expected to be able to communicate their advice in ways that require them to be as explicit as possible. Another type of expert is expected to handle the most difficult problems, those that cannot be tackled by the same approaches as those used by proficient workers to tackle well-defined problems. This requires a wider knowledge base, a critical approach and the ability to develop multiple representations of complex problems, as well as being able to work with clients and other people with different types of expertise. The cultivation of this kind of expertise requires a very different form of learning than that needed for the development of proficiency.

I would not expect placement students to become acknowledged experts, but it is not unreasonable to expect that the student body as a whole will engage with a very wide range of knowledge. Some kinds of knowledge are fairly tacit or become tacit with prolonged practice. Like riding a bicycle you don't have to think how you do it, but you still remember those early crashes. Other kinds of knowledge will be more explicitly used in problem solving, together with reasoning, assessing evidence and working with colleagues. Much of the work we do involves both cognitive and interpersonal skills.

My research into early career professional learning in the business, engineering and healthcare sectors forced us to consider precisely what was being learned; and this led us to describe a wide range of types of knowledge with a language that covered all three of these diverse occupational sectors. Others might have labelled the entries in our typology (see Table 2) as competences; but we felt this was wrong, because competences are typically defined in binary terms and often become dated. Moreover, most of us were primarily concerned both with continuing progression and with having to adapt or replace practices as improvements became available. So we chose to call each type of knowledge a *learning trajectory* and to adopt a *lifelong learning perspective*. Not only does the concept of learning trajectories fit our data much more closely than a set of competences, but it also takes into account discontinuities of learning so that at any one time:

- *Explicit progress* is being made on several of the trajectories that constitute lifelong learning
- *Implicit progress* can be inferred and later acknowledged on some other trajectories
- Progress on other trajectories is *stalling* or even *regressing* through lack of use.

Table 2 Typology of Learning Trajectories

<p>Task Performance Speed and fluency Complexity of tasks and problems Range of skills required Communication with a wide range of people Collaborative work</p> <p>Awareness and Understanding Other people: colleagues, customers, managers, etc Contexts and situations One's own organization Problems and risks Priorities and strategic issues Value issues</p> <p>Personal Development Self evaluation Self management 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</p> <p>Teamwork Collaborative work Facilitating social relations Joint planning and problem solving Ability to engage in and promote mutual learning</p>	<p>Role Performance Prioritisation Range of responsibility Supporting other people's learning Leadership Accountability Supervisory role Delegation Handling ethical issues Coping with unexpected problems Crisis management Keeping up-to-date</p> <p>Academic Knowledge and Skills Use of evidence and argument Accessing formal knowledge Research-based practice Theoretical thinking Knowing what you might need to know Using knowledge resources (human, paper-based, electronic) Learning how to use relevant theory (in a range of practical situations)</p> <p>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</p> <p>Judgement Quality of performance, output and outcomes Priorities Value issues Levels of risk</p>
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The most significant change in career terms is the award of a *qualification*, because this very public rite of passage symbolises generic competence in a profession, and is backed by the use of apparently clear and specific criteria for assessment. However, we also know that newly qualified professionals have remarkably varied profiles across most relevant learning trajectories, as a result of both their individual agency and the different opportunities offered by the learning contexts through which they pass. Thus, using learning trajectories both encourages continuity of

learning and counteracts the widespread delusion that a professional qualification represents competence in some all-encompassing generic form.

I envisage the 'points' on these trajectories as cross-referenced to cases or 'situated performances' in a manner that indicates the context in which that knowledge/skill was tacitly embedded or overtly expressed. The complexity arises not only from the variable factors noted in our definition of the performance domain (see above), but also from the integrated nature of a fluent performance, in which knowledge from several trajectories will almost certainly have been involved. I will return to this holistic aspect of performance later when I revisit the problem of complexity.

Nature of professional practice

My introduction referred to three aspects of performance: situational understanding, decision making and action. I have now expanded them to include working with other people and given them formal definitions, and added a fourth aspect, meta-cognition. The concept of *meta-cognition* is based on a person's ability to be aware of what they are doing or have just done. It includes an intuitive awareness of how things are going, spotting a need to change something in mid-stream, rapid moments of reflection and a more explicit attempt to remember and reflect on what happened through a personal diary or a group debriefing.

- *Assessing clients, and situations* (sometimes briefly, sometimes involving a long process of investigation), on your own or as part of group.
- *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*, individually or collectively; and modifying, consulting and reassessing as and when necessary
- *Meta-cognitive monitoring* of the people involved, (colleagues or clients, individually or collectively) and following the general progress of the problem, project or situation.

Each of these components of performance 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 action:

- Experts frequently generate and evaluate a single option rather than analyse multiple options concurrently
- Experts are distinguished from novices mainly by their situational 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.

This analysis of decision making draws our attention to the interaction between the four elements of practice listed above and the *time allocated* to them, whether by choice or under constraint. Table 3 below focuses on how this time variable affects the *mode of cognition* and/or *mode of consultation* of those concerned.

Table 3 Interactions between Time, Mode of Cognition and Type of Process

Type of Process	Mode of Cognition		
	Instant/Reflex	Rapid/Intuitive	Deliberative/Analytic
Assessment of the situation	Pattern recognition	Discrimination Rapid interpretation	Prolonged diagnosis Consultation, discussion and analysis
Decision Making	Reflex response	Recognition primed or intuitive response	Deliberative analysis or discussion
Overt actions	Routinised actions	Routines punctuated by rapid decisions	Planned actions with periodic progress reviews
Meta-cognitive engagement	Situational awareness	Implicit monitoring Short, reactive Reflections	Monitoring of thought and activity, reflective learning Group evaluation

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.

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 key to understanding the relationship between time and mode of cognition is that of which is given priority. The intuitive routines developed by experience enable people to do things more quickly and thus save time; but shortage of time may force people to prematurely adopt a more intuitive approach, and thus reduce quality or even make serious mistakes. Crowded contexts also force people to be more selective with their attention and to process their incoming information more rapidly than they would like. 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.

When there is no emergency, experienced people typically prefer to do many things quickly and smoothly, provided 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 genuine urgency in a *crisis* situation or by ongoing pressure for greater *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, *copying 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 loads*, 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 bring 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, either to try to describe them or to evaluate them. Indeed both description and evaluation threaten to diminish the utility of routines, which depends on putting your trust in them and not having to think about them.

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). Although newcomers may not have to change the practices they are just beginning to learn, they are likely to encounter others in the process of change; and they may need to become more aware of the problems it creates and why some practitioners fight against it.

Role of tacit knowledge in acquiring situational understanding

Situational understanding is a critical aspect of professional work, and probably the most difficult. Our natural tendency when something goes wrong is to blame either our decision-making or our consequent actions; because situational understanding tends to be taken for granted by all but newcomers. While newcomers may be well aware of their lack of situational understanding, they may not get much helpful feedback on it. This is because most people get so familiar with many situations that they cannot imagine anyone else "not being aware of the obvious". Thus newcomers' ignorance of the local culture may not be understood; and there may not be much information to help them learn about the situations and contexts that are so familiar to those around them.

One of the most important features of any workplace or community context is the people with whom one interacts - colleagues, friends, customers, clients, acquaintances. Yet much knowledge of other people is tacit: although one might gossip about them, one does not often have to put knowledge of people into words unless it is a specific part of one's job, and one might find it difficult to do so. Yet such knowledge provides the basis of unhesitating daily interactions with others. 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 both were present. Much of this information will take the form either of impressions of their character and behaviour or of memories of episodes in which they participated. Secondary data may include short comments or even stories about a person. While stories would normally be regarded as an explicit form of communication, they may 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. Such knowledge is unlikely, therefore, to be under one's critical control.

This knowledge, however, is part of one's taken-for-granted understanding of that person, and is liable to be both biased and self-confirming. The reasons for this bias include:

- 1) A series of encounters with another person is unlikely to provide a typical sample of his or her behaviour, because the reasons and circumstances for the meetings will largely determine the nature of those encounters, and our own presence is also likely to affect what happens. For example if you only meet another person in a class, you are very unlikely to acquire much valid information about how they might behave in other contexts.
- 2) Within those encounters, we are most likely to remember events that demand our attention, i.e. those that are most "memorable" rather than those which are most common; and these may be abnormal rather than typical.
- 3) Preconceptions, created by earlier encounters, affect both parties' behaviour on later occasions, so the sample is not constructed from genuinely independent events. You start where you think you left off, and that may lead to your own position being misunderstood.

4) People develop personal constructs (Kelly 1955), or ways of construing their environment, as a result of their life experiences; for example they may have favourite adjectives for describing various 'types' of people, and these affect their understanding of those whom they meet, and hence behaviour towards them.

Thus people are predisposed to interpret other people's actions in particular ways, creating preconceptions at early encounters which determine their own behaviour; and thus affect how others respond to them in ways which will often tend to confirm those preconceptions. Moreover, other people may have preconceptions about you, which may lead you to develop misconceptions about them. It is quite common for people to draw premature conclusions about each other, based on their early interactions. This often leads to unnecessary misunderstandings and the reinforcement of each other's prejudices; so it is important to find ways of opening discussions that create some space for different perspectives to develop. While tacit knowledge of other people will continue to play an important part in our lives, because it is available for almost instant use whenever we need it, it will rarely be as valid and unbiased as we like to assume.

Engagement with other people is very important in this context. Some people may not understand your questions because they cannot imagine not knowing the answers. So how can newcomers elicit their knowledge of the situations in which they work? In addition to having a supervisor or a mentor, it might be helpful to track down someone who has not been in that location for very long, especially if s/he is also a newcomer and can still remember their own starting experiences. Because then you can safely ask them the 'silly' questions you want to ask, without seeming too ignorant. They may also be able to put you in touch with those whom they found helpful themselves.

Similarly, if you move around your organisation, deal with clients or visit other people outside your workplace, then it is wise to find people in your own workplace who can brief you about what to expect and/or give you introductions to people who might help you when you get there. Who might give you some guidance about which people to ask about which sorts of things before or during your visit? Being prepared is always a good idea. It gives those you meet a better view of you and makes them more prepared to help you; so having done your homework gives you a better start.

Additional factors contribute to the mixture of tacit and explicit knowledge which constitutes one's knowledge of an organisation, context or situation (Eraut, 2000b). Many situations, for example, are dominated by the differing perspectives of the participants and even those 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 use terms like "acculturation" or "socialisation" to describe the often unconscious absorption of norms, values and other kinds of culturally embedded knowledge. Thus norms, local discourse and other aspects of an organisational or occupational culture are acquired over a significant period of time by processes which implicitly add meaning to what are explicitly interpreted as routine activities.

However, your interpretations may also be unknowingly influenced by a process of tacit generalisation, during which interpretations of unfamiliar people, situations and contexts are affected by your prior knowledge of more familiar, but not necessarily similar, people, situations and contexts. All these processes are well documented in the psychological literature. Indeed tacit understanding not only contributes to relationships and situational understandings within an organisation but also to important transactions with external clients, customers, suppliers and stakeholders. Hence, it is important to keep asking yourself questions about your colleagues and how and why they behave as they do? What is the prevailing culture of your environment? How does your group engage with and behave towards other groups in the same organisation?

You may also have to consider the natural variation between individuals. While there may be a taken-for-granted workplace culture, people may still interpret it in rather different ways, even when they use the same vocabulary. Awareness of some of these differences and of local power relations, both formal and informal, will give you a

better idea of what is likely to happen when new issues arise or old issues are revisited. As you get to know people better, you may also learn who might help you to check your hunches.

It should also be noted that tacit knowledge does not arise only from the implicit acquisition of knowledge but also from the implicit processing of knowledge. Doctors remember large numbers of individual cases and a few occasions when they deliberately stopped to think about a particular kind of case; but they cannot explain how that accumulated experience enables them to instantly address a new case by recognising a pattern and activating a readily available script, which they never consciously attempted to compile. Indeed, the research literature on expertise consistently finds that the distinguishing feature of experts is not how much they know, but their ability to use their knowledge, because that knowledge has been implicitly organised for rapid, efficient and effective use (Schmidt and Boshuizen, 1993).

This process is very similar to the informal aggregation of encounters with a friend or colleague, described above as an important contributor to situational understanding. In medicine, however, there is also considerable scientific evidence to support or confute the doctor's first hypothesis, except in complex cases which require considerable problem-solving, trying things out and often consultation with colleagues. Nevertheless, the tacit recognition of diagnoses based on familiar scripts saves a great deal of a doctor's time. In business, however, the call for constant action is so strong that people often jump to premature conclusions.

Given these uncertainties, it is useful for newcomers to have research skills in areas like interviewing; because it enables them to frame more effective questions at both cognitive and emotional levels. However, it would normally be inappropriate to sound like an interviewer, so you have to slip questions into ongoing conversations. The skill comes through preparing the ground so that your questions seem natural, asking the right kinds of question, i.e. those that open up a conversation from which you learn useful things, and expressing your interest in a manner that helps to extend the conversation. In general, it is best to ask about current situations first and find out how people are dealing with them in some detail if the occasion allows it, then to ask about how typical they are, what other situations you might encounter and what might be more different about them. Concrete questions are easier for people to answer, as well as providing an important basis for your future learning.

Role of tacit knowledge in decision making and action

Skills are defined in terms of knowing how to do things; and nobody will accept a purely textual account as evidence of a skill. 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 formal teaching alone. However, many important work processes involve a combination of formal, codified knowledge and skills of many kinds; in which these components are highly integrated and interdependent (1994). Thus a person's negotiating skill will affect the way in which they use their formal knowledge and even the choice of that knowledge. However, a technician trouble-shooting a piece of electronic equipment will carry their formal knowledge in a personal form which has already been adjusted to suit that kind of work, and only familiar to those doing similar work (see the section below on knowledge transfer).

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 try to 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.

The research into naturalistic decision-making in less time-pressured situations, which allow at least some deliberation, suggests a quite different role for the intuitive use of tacit knowledge when situations become more complex and uncertain. These are often described as involving judgement. One common kind of situation concerns deciding what to say and how, for which simple examples might be (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 time you can find; and you will hope to reach a point where you feel that you have got it right. However, when you are about to start some new information or reflection may cause you to adjust your plan to something you think will be more appropriate. Then if it does not seem to be having the desired effect, you may wish to seek advice, find out more or just change your approach next time.

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 there will often be conflicting interests and different timescales 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

My 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, 2004).

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 previous sections of this chapter were designed to address this major problem, and were based on a mixture of the good and bad examples encountered in our research.

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 field 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.

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, aspects of 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.

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
- Using mediating artefacts (see next section).

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.

Modes of learning

This section is based on our recent research into early career professional learning. After following cohorts of accountants, engineers and nurses through their first three years of employment, we accumulated a very large

number of learning events in context. It took us some time to classify this data into a typology of learning modes, but eventually we found a very simple pattern. First we decided to classify learning processes according to whether their principal object was working or learning (Eraut et al. 2005a; Eraut, 2007b). Thus processes in the left column of Table 4 below were judged to be *working processes*, from which *learning* was a *by-product*, while those in the right column are clearly recognizable as *learning processes*. Then we decided to distinguish between processes, which were clearly bounded and relatively time consuming, and comparatively *short activities*, such as asking questions, observing or reflecting. These activities could occur many times in a single process, and were found within almost every type of process, often several at a time. When we moved these 'activities' into a different category in the central column of Table 4, we obtained the much tidier typology that we finally used.

Table 4 A Typology of Early Career Learning

<i>Work Processes with learning as a by-product</i>	<i>Learning Activities located within work or learning processes</i>	<i>Learning Processes at or near the workplace</i>
<i>Participation in group processes</i> <i>Working alongside others</i> <i>Consultation</i> Tackling challenging tasks and roles Problem solving Trying things out Consolidating, extending and refining skills <i>Working with clients</i>	Asking questions Getting information Locating resource people Listening and observing Reflecting Learning from mistakes Giving and receiving feedback Use of mediating artefacts	Being supervised Being coached Being mentored Shadowing Visiting other sites Conferences Short courses Working for a qualification Independent study

Work processes with learning as a by-product account for a very high proportion of the reported learning of people we interviewed during our mid-career and early career projects, over 90% for the engineers and nurses and over 80% for the chartered accountants, who were also receiving formal training for their professional qualification. Their success depended both on the available opportunities and on the quality of relationships in the workplace. Hence the amount of learning reported varied significantly with person and context.

The majority of this learning through working involves learning from other people. Four of the entries in the left column (in italics) require the presence of other people; and the other four may also involve other people. The main reason for this is the use of tacit knowledge, which we have already discussed at some length; another is that on-the-spot communication is simpler, shorter and more natural. What is seen and heard does not need to be explained in full.

Participation in group processes covers both *team-working* towards a common outcome, and groups set up for a special purpose such as discussing a client, problem solving, reviewing some practices, planning ahead, or responding to external changes.

Working alongside others allows people to observe and listen to others at work and to participate in activities; and hence to learn some new practices and new perspectives, to become aware of different kinds of knowledge and expertise, and to gain some sense of other people's tacit knowledge. This mode of learning, which includes a lot of observation as well as discussion, is extremely important for learning the tacit knowledge that underpins routines and intuitive decisions and is difficult to explain. When people see what is being said and done, explanations can be much shorter and the fine detail of incidents is still in people's minds. Clues to situational recognition may not be remembered, unless they are picked up on-the-spot by questions or comments. Moreover, multi-sensory engagement over some time enables the gradual development of tacit as well as explicit situational understanding.

Consultations within or outside the working group or even outside the organisation, are used to co-ordinate activities or to get advice. The act of initiating a consultation, however, depends on the relationships between the parties, the extent of a worker's network and the culture of the workplace. For *newcomers* the distinction between a consultation and being mentored or supervised is not always clear, as part of a mentor's or supervisor's role is making oneself available for consultation.

Tackling challenging tasks and roles requires on-the job learning and, if successful, leads to increased motivation and confidence. However, people are less inclined to take on challenges unless they feel confident both in their ability to succeed as a result of previous experience and in the support of their manager and/or colleagues. Without such previous experience and support, challenges pose too high a risk.

Problem solving, individually or in groups, necessarily entails learning; otherwise there would be no problem. Such problems are not just technical, they may involve acquiring new knowledge before one can start, searching for relevant information and informants, imagination, persistence and interpersonal negotiation.

Trying things out is distinguished from less purposeful behaviour by the intention to learn from the experience. It requires some prior assessment of risk, especially where other people might be affected, and may require special arrangements for getting feedback, as well as time for subsequent reflection and evaluation.

Consolidating, extending and refining skills are particularly important when entering new jobs or taking on new roles, when it is sometimes supported by episodes of supervision, coaching or feedback. It is greatly helped by informal personal support and some sense of an onward learning trajectory (see above).

Working with clients also entails learning (1) about the client, (2) from any novel aspects of each client's problem or request and (3) from any new ideas that arise from the encounter. Some workers have daily experiences of working with clients, which may or may not be recognized as learning opportunities. Some progress from less to more important clients, or from those with simple needs to those with more complex needs. There can also be a strong *emotional dimension*, when a client arrives in a distressed state or is about to receive bad news. This is a context where sharing experiences can be helpful. Another factor is the extent to which client contact gives the work meaning and value, and thus enhances workers' sense of collective purpose.

Learning processes at or near the workplace

The right column of Table 4 lists nine processes whose *prime object is learning*. These are listed in terms of their *proximity to the workplace*. Thus supervision, coaching and mentoring are at or very near the learner's normal workplace; shadowing and visiting other sites are usually in other people's workplaces; conferences, short courses and working for qualifications are usually not in workplace settings; and independent study can be followed almost anywhere that is quiet.

For most workers the main influences of their *line manager* on their learning were through the allocation of work, appraisal, and support for any formal; learning requiring fees or time away from the job. New young employees were usually supervised by the person 'in charge' of the relevant work group. The manager's role in enhancing or constraining learning is discussed in Section 2.3 below.

Coaching and *mentoring* are provided mainly for newcomers, and occasionally for newly appointed managers and training in new technology. Coaching is often limited by managers not being prepared to release potential coaches from their normal work, and mentoring by lack of informal opportunities to develop an appropriate relationship. In many situations mentoring is provided by helpful others, who are not designated mentors, and this is usually best for mutual on-the-spot support and feedback.

Shadowing and *visits* to other sites are used for inducting some newcomers, for workers taking on new responsibilities and for improving cooperation between different sites. They could be very helpful for developing a *wider understanding* of projects, other work groups, suppliers and customers; but this need is often underestimated.

Conferences are probably more important for updating and networking than for direct learning, and *short courses* were the main kind of formal Continuing Professional Development. Attending short training courses was important for some people at particular stages in their career. But even then, work-based learning was important in developing the ability to use what has been learned off-the-job. This was especially true for short courses, which have very little impact unless they are appropriately timed and properly followed up at work.

Independent study may be supported by the provision of *knowledge resources* and/or agreed plans, such as lists of competences, learning projects or personal development plans. Formal training and knowledge resources such as manuals, reference books, documentation, protocols and an intranet were generally available to all workers, the engineers in particular using the intranet as their prime source of current information. Apart from essential textbooks, manuals and guides received limited use. Learners generally found it quicker and more effective to get information directly from more knowledgeable colleagues or the minority that did conquer the manuals.

Learning activities located within the processes described above

The nine learning activities in the central column of Table 4 were embedded within most of the work processes and learning processes, but were also found in short opportunistic episodes. The key issues for learning are the frequency and quality of their use.

Asking questions and getting information are important, proactive activities; and good questions and knowledge searches are appreciated in positive learning contexts. However, many novices feel diffident about asking questions of senior colleagues unless they are working together and the question is spontaneous. They feel that asking a "silly" question would reflect badly on their reputation and are afraid of being prematurely labelled as a "weak" practitioner. This constraint, however, does not apply to talking to peers or novices a year or less ahead of them who still remember what it was like at their stage; and this should be considered when allocating and supporting newcomers.

Locating resource people is also a proactive activity that requires confidence and social understanding. Some early career professionals were very proactive in seeking out and developing relationships with a wider network of knowledge resource people, while others gave it little attention, often because they did not appreciate its potential value. Resource people may be gatekeepers and/or guides to who knows what and who is prepared to support newcomers. Progression routes to more ambitious tasks may depend on whom you get to know; and willingness to engage in routine work may earn you the right to get access to more challenging work.

Listening and observing activities are very dependent on what the observer/listener is able to grasp and comprehend; and comprehension depends on awareness of the significance of what has been said and/or done. Such awareness and understanding is developed through discussion and reflection. Much is learned through watching other people communicating with colleagues, clients or subordinates. However, it should be noted that our research encountered as much learning from bad examples as from good examples! Sometimes the best role models are among the support staff.

Learning from mistakes is possible in most working contexts, both from one's own mistakes and those of others; but opportunities for this activity are frequently missed. Another important issue concerns when it is better to be taught the right way and when it is better to allow people to learn from their mistakes.

Reflection is included here, because it occurs both on and off the job and often plays an important role in recognizing and learning from mistakes. Authors such as Schon (1983, 1987) have argued that reflection lies at the centre of nearly all significant learning, but have not fully explored the range of reflective learning agents (individual or group), foci (current, past or future), contexts (busy or relaxed) and purposes (monitoring, decision making or learning) and their influence on the reflective process.

Giving and receiving feedback are both important, often vital, for most learning processes. We found four main settings for feedback:

Immediate comment on aspects of a task or role given **on-the-spot** or soon after the event by a co-participant or witness.

Informal conversations away from the job often convey indirect and/or unintended messages as well as intended advice; but don't pay attention to second hand feedback out of context, because these second hand messages often misinterpret what was said.

Formal roles such as mentor or supervisor involve some responsibility for a learner's short to medium term progress and an obligation to provide formative feedback on a regular basis; but this may not happen in practice.

Appraisal is a process where designated appraisers are expected, but rarely succeed in, giving normative feedback on personal strengths and weaknesses and ascertaining views on learning opportunities and meeting expectations

Although most learners need short-term, task-specific, feedback as well as longer-term, more strategic, feedback on general progress, the two are not necessarily found together. Good short term feedback on performance was often accompanied by an almost total absence of strategic feedback, giving even the most confident workers an unnecessary sense of uncertainty and lowering their commitment to their current employers (Eraut 2007).

Most people at work get too little feedback; so being proactive can be very important. In the early stages it is best for newcomers to try and get some feedback from people just ahead of them. You can get a lot of feedback by asking about your performance in particular situations; and it is more useful to you and easier for those asked if you seek advice on how you could improve. Later on you can ask whether they know of any alternative approaches and what are their merits and/or disadvantages. Don't be reluctant to ask for an informal appraisal from someone who knows you better than your formal appraiser.

Mediating artefacts need more explanation in spite of their considerable value, so we provide some examples from our recent research into the learning of early career, accountants, engineers and nurses. They play a very important role in structuring work and sharing information by mediating group learning about clients or projects in progress. Some artefacts in daily use carry information in a standard way that novices soon learn to understand. In both nursing and engineering, these include measurements, diagrams and photographs. For example, patient records cover temperature, fluid intake and output, drugs administration, biochemical data and various types of image. These refer both to the immediate past and to plans for the immediate future, and salient features considered important are prioritised for the incoming shift at every handover. Understanding the thinking behind the handover rituals is essential learning for newly qualified nurses.

A mechanical engineer was observed discussing virtual design 'drawings' on the screen over the telephone with colleagues, contractors and clients on an almost daily basis; and she also sent digital photographs and measurements to initiate a discussion about a sagging bar. A water mains planning engineer and her colleagues all used her meterage progress reports to decide whether to clean out a mains pipe, re-line it with plastic piping, or replace it, all with different associated costs and time implications.

Accountants learned how to interpret audit files and the 'tests' they were given for sampling their clients' data. They learned to give some priority to significant changes in accounts over time; and they needed considerable tact to find out how their clients' business processes were represented in their accounts when their clients' accountants regarded them as self-evident.

Then at a higher level of complexity, engineers used design specifications and software packages; and nurses used the MEWS protocol for deciding when a patient needed urgent attention and patient pathway protocols for patients with particular conditions. Accountants used software packages for organizing their auditing processes. The really expensive ones were used as a guide for the auditors through their tasks, as a framework for assigning sub tasks, as a repository of accumulated judgements, as an archive of explanatory material, and as a record for the following year. The distinctiveness of these higher level artefacts was their incorporation of a considerable amount of professional knowledge, and they could be used, albeit under supervision, before all that knowledge had been acquired.

Finally, I should add that textbooks, technical manuals and sets of data can also be seen as mediating artefacts; and that it is usually best not to consider any artefact as containing all the knowledge you need. Much of the practical knowledge does not reside in the artefact itself, but in the conversations that take place around the artefact. However, these conversations would be very difficult to develop without the artefact, which therefore plays a very important role in sharing knowledge.

Factors affecting learning at work

One prominent finding of our earlier research on mid-career learning was the overwhelming importance of *confidence*. Much learning at work occurs through doing things and being proactive in seeking learning opportunities; and this requires confidence. Moreover, we noted that confidence arose from successfully meeting *challenges* in one's work, while the confidence to take on such challenges depended on the extent to which learners felt *supported* in that endeavour by colleagues, either while doing the job or as back up when working independently. Thus there is a triangular relationship between challenge, support and confidence (Eraut et al. 2000). The contextual significance of the word "confidence", which was used by our respondents without further elaboration, depended on which aspects of this triangular relationship were most significant for particular people at particular points in their careers. The dominant meaning for most mid-career respondents usually came close to Bandura's (1995) concept of *self-efficacy*, a context-specific concept, relating to ability to execute a particular task or successfully perform a role. For some mid-career respondents, however, confidence related more to *relationships* than to the work itself. Did they feel confident about the *support* and *trust* of their working colleagues, in more senior, more junior or parallel jobs? This depended on whether they perceived their more significant working relationships as mutually supportive, generally critical, faction-ridden or even overtly hostile. For early career professionals, this latter aspect of confidence was more prominent.

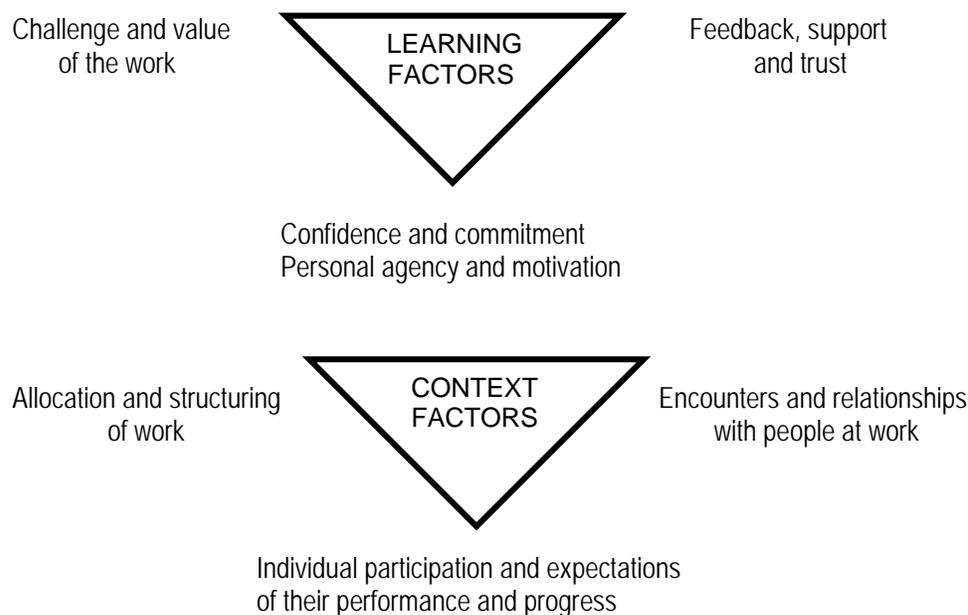
Figure 1 below shows how our early career project, where observations over a three year period added greatly to our understanding of contexts, was able to expand this triangular relationship to include new features. We added *feedback* and *trust* to support and the *value of the work* to the challenge, because both had a major influence on *motivation* and *commitment*. Feedback was especially important during the first few months of a new job, when it was often best provided by the person on the spot. This happened within the 'distributed apprenticeship' approach we found in accountancy, and in other organisations where local workplaces had developed a positive learning culture of mutual support. In the longer term, more normative feedback on progress and meeting organisational expectations also became important.

Equally important for developing confidence after the first few months was the *right level of challenge*. Newly qualified nurses were over-challenged physically, mentally and emotionally by their sudden *increase in responsibility* and the unceasing *pressure of work* in most ward environments. While some engineers progressed

through a series of challenging assignments with remarkable rapidity, most of them were under-challenged and many of them were seriously under-challenged. The value of their work carried many nurses through their unnecessarily pressured start, and this was strengthened in some contexts by their *social inclusion* in supportive teams. We also noted the importance of *personal agency* in sustaining their motivation after their early period of settling into their new environment, and that this was not necessarily always aligned with their employer's priorities. Personal agency is particularly significant in placements, when many employers have no long term stake in students' learning and are therefore more likely to leave such matters to local managers. Hence it has been given some priority in this document.

The role of *extrinsic motivation* is frequently discussed in the workplace, and we feel there is no need for us to discuss it here. However, Thomas' (2000) framework provides a useful basis for exploring intrinsic motivation, which is less well understood. Under *opportunities* he puts *sense of choice* over work activities and *sense of the meaningfulness* of their purpose; and under *accomplishment* he puts *sense of competence* in their work activities and a *sense of progress* in their purpose. This gives four kinds of intrinsic motivation, which were all prominent in the research reported above.

Figure 1 Factors affecting learning at work: the Two Triangle Model



The inclusion of observation in this study enabled us to give more attention to the allocation and structuring of people's work, their relationships at work and their level of participation in workplace activities; and this led us to the extension of our model to include a second triangle. This mirrors the first triangle, but focuses on the contextual factors that influence its learning factors.

The allocation and structuring of work was central to our participants' progress, because it affected (1) the difficulty or challenge of the work, (2) the extent to which it was individual or collaborative, and (3) the opportunities for meeting, observing and working alongside people who had more or different expertise, and for forming *relationships of mutual trust* that might provide *feedback and support*. Our analysis of modes of learning in the workplace confirmed the importance of relationships by showing how many of the prominent modes of learning on

the left side of Table 4 were dependent on good relationships with other people. These were not necessarily very close relationships but they required some mutual respect and a disposition to collaborate.

For novice professionals to make good progress a significant proportion of their work needed to be sufficiently new to challenge them without being so daunting as to reduce their confidence. Their workload needed to be at a level that allowed them to respond to new challenges reflectively, rather than develop coping mechanisms that might later prove ineffective. This usually worked well in our two accountancy organisations; but in engineering the appropriateness of the allocated work differed hugely according to the company and the specialty. Very few graduate engineers in electronics or computer science had sufficiently challenging work and nobody appeared to take any responsibility for addressing this problem. In nursing the quality of learning was mainly influenced by the ward manager and her senior nurses, and some of the best and worst learning environments we observed were in the same departments of the same hospitals. Eraut et al (2005b) provides a more substantial account of these factors and their interactions.

We found that decisions affecting the structuring and allocation of work could be determined by any combination of the following factors:

- 1) The nature of the work, the way in which the organisation handled it and the discretion given to local managers in decisions of this kind. In all three of our professions local managers had significant opportunities to facilitate learning through their allocation of work and support of novice workers.
- 2) The quantity and urgency of the work in hand at the time. This was a major issue in hospitals where work overload almost overwhelmed novice nurses, while at the same time reducing the amount of support they could get from more experienced colleagues; and was sometimes important in engineering, if a company was undergoing a fallow period that limited the supply of challenging assignments.
- 3) Periodic decisions made by managers in which learning needs might or might not have been considered. This was relevant when allocating novices to audit teams, nursing shifts or medium term engineering tasks.
- 4) Decisions made by more experienced colleagues with delegated authority, who were currently working with the novice, and were probably best able to judge the appropriate level of challenge if they thought it was important.

Whether these decisions benefited the learning of the novice professional depended on the disposition, imagination, competence (in making these kinds of decisions) and available thinking time of those who made them.

Role of the manager in supporting learning

This section follows up the implications of the previous two sections, then moves on to consider the role of line managers in the longer term development of those they manage. These roles are complementary and the optimal balance between them will vary with the context. As organisations focus increasingly on learning which takes place on or very near to the job, so their attention has concentrated on the role of the line manager as a facilitator of learning. In many ways the responsibility placed on line managers as agents of the organisation in matters of skills and learning is the single strongest plank of their learning strategies. It is part of a much wider move to extract the HR or training function from delivering quite so much in terms of people management and placing this responsibility back onto the line. So managers are left much more to use their own initiative to identify learning needs at team or unit level.

The two triangle model of factors affecting learning presented in Figure 1 indicates how learning opportunities in the workplace depend on both the organization of work and good relationships. This is an area where managers and supervisors can play an important role in promoting and enhancing the learning of those whom they manage, both individually and collectively. One major obstacle is that knowledge of workplace learning is conspicuously

absent from most workplaces, even though most of the required behaviours are within most workers' capability and simple common sense. Moreover, much of what is needed can be done by people other than managers. The manager's role is not to do most of the learning support themselves, but to set the climate, encourage their staff to take on this role as an integral part of their working responsibility, and include the facilitation of learning in their management of performance.

To fulfil this role managers need to know that:

- Being over-challenged or under-challenged is bad for learning and morale. So providing an appropriate level of challenge is important for developing confidence and making good progress. Hence this needs to be given attention when allocating and structuring the work of individuals and groups. When this is not under the control of the managers concerned, they should discuss it with their immediate peers and draw it to the attention of their own managers.
- The quantity and quality of *informal learning* can be enhanced by increasing opportunities for workers to *consult* with and *work alongside* others in teams or temporary groups. Hence good opportunities are needed for meeting and working with others to develop mutual trust and cooperative relationships.
- They may need skills in conflict resolution and addressing bad relationships that threaten the group climate and/or achievement, and to consult others for a second opinion or mediation if they themselves are directly involved.
- Support and feedback are critically important for learning, retention and commitment. Feedback is most effective within the context of good working relationships, and the rapid feedback essential for short term learning is best provided by people on the spot. Hence it is important for managers to develop a positive learning culture of mutual support both among individuals and within and across work groups.
- More traditional feedback on progress, strengths and weaknesses, and meeting organisational expectations, is also needed; and this is discussed at some length below.
- Upsetting feedback, anxiety about one's status or performance, client behaviour, relationships or events outside the workplace can all influence the emotional dimension of a person's working life; and this may require ongoing attention for a period. The manager needs to signal their awareness and to check that their workers are receiving appropriate support.

The role of line managers in supporting learning is quite complex. It includes identifying skill and learning needs at both individual and group level in relation to their understanding of what performance should resemble or achieve. It also embraces discussions with individuals about their own work and career aspirations and the extent to which the organisation can support these through learning opportunities inside or outside the organisation. Where the individual or team needs learning support, it is up to the manager to think about whether this should be in the form of a course or through on-the-job coaching or less intensive advice and feedback. For the former, the setting of training objectives and decisions about how to procure training would also often rest with the manager, ideally in discussion with a training professional. For the latter, the manager will either have to do the on-the-job coaching themselves, or find someone else to do it. Managers are also expected to make an input into learning evaluation and to assess the impact which learning has on job performance. The deceptively simple phrase 'manager as coach' does not really unpack either the complexity or the scale of learning which is often needed in a team.

Workplaces are complex inter-personal environments, where managers need to be well informed about relationships and personal or collective concerns without being unduly intrusive. They also need to delegate and to work through other people as well as by direct action. Otherwise, they will never have enough time to realize their good intentions and those they manage will have less opportunity for self development. It is increasingly recognized that frequent informal conversations with individuals and small groups create good settings for preparing people for coming issues, listening to their problems and concerns, seeking their advice, asking them to consult others about a problem and come back with suggestions, etc. In this context their personal interests need

as much attention as the collective interest, if they are not to feel exploited. This means being supportive both when they have personal problems and in developing their future careers.

The IES Report, *Managers as Developers of Others* (Hirsh et al, 2004), was based on managers' roles in developing their workers in four organisations, two in the private sector and two in the public sector. Its data was collected from interviews with *givers* and *receivers* of *good* or *bad development* support; so it was designed to investigate relationships between pairs of people rather than groups and to focus on 'development' which may be taken rather more widely than job-related 'learning'. They found that *good development* was delivered through a supportive relationship, sometimes short-lived but often over a period of months or years and was typically characterised by the following features:

- Managers set a *climate* in which they are easy to approach, and where development is an important part of working life.
- They build *developmental relationships* with individuals in their teams and more widely. These relationships are often fostered by frequent, informal conversations about work, listening to concerns and the offer of positive support.
- Good development support is quite *focused* through a clear, shared analysis of development needs, frequent review and honest but constructive *feedback*.
- The delivery of development is through a wide range of learning methods tailored to individual needs. They often engage in *informal coaching*, make good use of formal training offered by the organisation, and focus heavily on finding the *right kinds of experience* both within the job (often through delegating developmental tasks) and outside the job (through projects etc.).
- They offer *active career development* and work to help individuals have a realistic sense of their own potential and readiness for possible job moves. They see the individual in the context of their previous work experiences and their interests and obligations outside work.

These individuals reported increases in motivation and behaviour at work resulting from the increased sense of interest in work they obtained from the first two or three steps above. So it seems that attention to development can both improve the capability of individuals and improve their motivation and engagement.

Another study examined the views of employees in large UK organisations about career development discussions (Kidd, Hirsh and Jackson, 2004). Only 7% of the discussions which employees found useful in their career development took place in the formal setting of appraisal. At least half were informal, i.e. not part of any HR or management process. The key to an effective career discussion was combining a high level of mutual trust with challenge and information-giving. This gave employees a better sense of direction, increased self-awareness and more confidence; and led to concrete actions by both parties.

A survey by the Career Innovation Group (Winter and Jackson, 2004) asked over 700 high performers in a small sample of large, mostly global, organisations to comment on the conversations they had at work which had high impact on them. Not surprisingly, these high performing employees are the kinds of people who get a lot of attention, and they had a quite a lot of conversations about their work, especially with their managers. However they were not always getting the types of conversations they most needed:

- They had far more high impact conversations about their performance than about their development.
- The lack of development conversations was a major source of dissatisfaction which also correlated with intention to leave. The big conversation gap in relation to development was about career development (especially future career opportunities and development planning for the future) rather than skills and training for the current job.

- 40% of respondents had an issue about work which they had no opportunity to discuss. These were nearly three times more likely than other respondents to be planning to leave the organisation in the next twelve months.

The study concluded that conversations about performance which do not also address development for the future do not engage high performing employees. In other words “the best leaders are those who address performance and development together.”

All three of the studies above suggest that semi-formal discussions may be helpful i.e. the conversation itself is planned, but its structure and agenda are not over-prescribed. They also support the need to talk about development in a holistic way and not just through a list of skills or competencies related to the current job.

We conclude that managers have a major influence on workplace learning and culture that extends far beyond most job descriptions. Doing nothing about learning and development will have a strong negative effect. Thus managers need (1) to have greater awareness of the modes through which people may learn in the workplace, (2) to recognise and attend to the factors which enhance or hinder individual or group learning, and (3) to take the initiative in the longer term development of their staff. Preparation for this role should be given much greater priority in management development programmes, incorporated into qualifications for managers and supervisors, and included in the appraisal of all managers. The justification for giving this such high priority is that what is good for learning is also good for retention, quality improvement and developing the skills and people that will be needed in the future. An important final point is that what we are asking managers to do for those they manage differs very little from what the managers in the IES study wanted for themselves.

New developments in understanding student professional work placements at Surrey

Since writing the above chapter, I have been engaged in a number of activities at the University of Surrey, which will be fully described in later chapters, aimed at utilising the knowledge that has been developed about the way professionals learn through work, to help improve the learning of students while they are on their work placements. About half of the students at the University undertake year long professional training work placements so this provides a natural laboratory for knowledge transfer.

In order to get more evidence of student experiences of placements, SCEPTrE invited all those students who had just returned from their placements to enter for a prize essay entitled *Learning to be Professional: the story of my placement experience*. 29 students submitted accounts and following a review by several Faculty five prizes were awarded. The results of this work were summarised in a synthesis (Riley 2009) and they will be described in another e-book chapter. I interviewed 9 students who agreed to help me. There were a few questions about their essays, but my interview focussed mainly on the people who most influenced their placement learning at different stages of their placement, for better or for worse. This provided a wealth of evidence about the people who most affected those students' placements to fit alongside their accounts of what they learned and its significance for their learning about professional work.

We then decided to try to get a wider range of information from the following cohort of students on placements by using an e-questionnaire. Making changes from the mainly early career flavour of this chapter into the placement situation with its different relationships was helped by several Surrey colleagues; but turning the prose of this chapter into short questions was very challenging, and I struggled to design a prototype version, which my Surrey colleagues could then improve. The main six sections of the questionnaire dealt with:

- The Importance and Frequency of types of Work Activity (18 questions for each)
- Student views of the Quality (10) and Career Outcomes (5) of their placements
- Support for Learning Tasks (7), Project Work (7) and Learning to take on Key Roles (4)

- The Roles of those people who most influenced their learning at work (8) and the kind of help they provided (17)
- The Personal Initiatives which they took in order to improve their learning (11)
- The Quality of the Preparation and Support they received from the University before and during their placements (14).

There were 127 complete or nearly complete responses to this challenging and quite time consuming questionnaire (it took about 40 minutes to complete) which is a measure of the considerable interest students have on their own experience and learning.

There are many possible ways of analysing this very interesting and important data including correlations between different questions, differences between the four faculties and between the larger departments. It has taken some time to first analyse and then consider how best to present the data. A number of presentations have been given but the final version will be presented as an e-book chapter early in 2010.

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