

# Informal learning in the workplace

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This paper focuses mainly on theoretical frameworks for understanding and investigating informal learning in the workplace, which have been developed through a series of large- and small-scale projects. The main conclusions are included but readers are referred to other publications for more detailed accounts of individual projects. Two types of framework are discussed. The first group seeks to deconstruct the 'key concepts' of informal learning, learning from experience, tacit knowledge, transfer of learning and intuitive practice to disclose the range of different phenomena that are embraced by these popular terms. The second group comprises frameworks for addressing the three central questions that pervaded the research programme: what is being learned, how is it being learned and what are the factors that influence the level and directions of the learning effort?

## Introduction

The term 'informal learning' has been used increasingly in adult education for several reasons. It provides a simple contrast to formal learning or training that suggests greater flexibility or freedom for learners. It recognizes the social significance of learning from other people, but implies greater scope for individual agency than socialization. It draws attention to the learning that takes place in the spaces surrounding activities and events with a more overt formal purpose, and takes place in a much wider variety of settings than formal education or training. It can also be considered as a complementary partner to learning from experience, which is usually construed more in terms of personal than interpersonal learning.

Apart from being under-researched, the workplace context brings new perspectives to research on learning because it encompasses a wide range of more or less structured environments, which are only rarely structured with learning in mind. This is also true of family and community contexts, which are even more difficult to research. However, I would argue that formal education can be also viewed as a workplace and uses a discourse in which the term 'work' is normally quite prominent. Students are given work to do and described as good or hard 'workers'. Moreover, it is usually the work that is structured and not the learning. A great deal of informal learning has been

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observed to take place in or near formal education settings, but research into the outcomes of such informal learning is very limited.

This paper is based on several funded research projects focused on the workplace learning of professionals, technicians and managers; some focused on learning during their first years of employment, some on mid-career learning. In all cases the majority of the learning in the workplace itself was informal, and involved a combination of learning from other people and learning from personal experience, often both together. The paper starts with a brief description of the methods used to collect data for these projects, then returns to some further analysis of the nature of informal learning, before deconstructing the concepts and processes entailed in 'learning from experience', a catch-all phrase that has dominated both adult education and learning in the workplace without much critical attention. Knowledge acquisition and use in complex situations is then discussed through two contrasting examples, learning about other people and learning to use scientific and other forms of academic knowledge in practice contexts. It is further argued that professional, managerial and technical performance are normally complex and typically involve the simultaneous use of several different types of knowledge and skills, which have to be learned more holistically. This affects how, and how much, people think while they are in action, and puts 'ready-to-use' knowledge at a premium, sometimes irrespective of its quality. Finally, the paper returns to the three questions below that have guided all my research into learning in the workplace, and presents frameworks for addressing these questions that have been constructed as the research programme has progressed:

- What is being learned?
- How is it being learned?
- What factors affect the level and directions of learning effort?

## Methodology

I have reviewed some of the research methods used in this type of research elsewhere (Eraut *et al.*, 2000). The most common have been interview studies, because these are the easiest to arrange and questionnaires are deemed to be unsuitable, except possibly for testing whether some findings from interviews can be generalized to a larger group of respondents. However, such interviews are not easy to conduct for reasons that will emerge throughout this article. Interviews have used the following foci:

- key lifetime events (McCall *et al.*, 1988);
- learning projects (Tough, 1971; Gear *et al.*, 1994);
- recent changes in respondents' life or practice (Fox *et al.*, 1989);
- situations where more knowledge or skill was needed (Slotnick, 1999).

All have yielded interesting results. Ethnographic studies have given many valuable insights into socio-cultural aspects of learning in particular settings, but are difficult to get funded in most countries for other than doctoral research.

My own research began with interview studies, but there were also opportunities for short observations in two of those projects; and one doctoral student did a participant observation study in a hospital ward with additional knowledge elicitation interviews. The interviews avoided focusing on critical incidents or salient episodes, like the studies cited above, for two main reasons: those studies highlighted learning from atypical situations rather than normal practice, and they were ill-suited to eliciting information about implicit learning, slow gradual learning or tacit knowledge. Our interviews focused instead on how people learned to do what they were then doing. They started by inviting our respondents to describe their work in a very detailed manner, including all the ordinary everyday aspects, and to recall the activities of the previous and current weeks; and also whether other weeks were different and, if so, in what way. The discussion then moved on to the issue of what types of knowledge, skill, or competence are needed to do the work, and finally to how these were acquired. Short periods of observation (one to two days), when feasible, were used to gain some understanding of the work setting, to note other people in the workplace and their interactions with our respondent, and to observe the extent to which the work used cultural artefacts in text, electronic or other forms. These observations were not treated as typical samples, but used to initiate conversations about practice and the practice environment that were specific and concrete, rather than generic and evaluative. It emphasizes the role of the interviewer as a stranger to the work setting, to whom even simple acts and circumstances may need to be explained.

The main problems in conducting such research are that:

- informal learning is largely invisible, because much of it is either taken for granted or not recognized as learning; thus, respondents lack awareness of their own learning;
- the resultant knowledge is either tacit or regarded as part of a person's general capability, rather than something that has been learned;
- discourse about learning is dominated by codified, propositional knowledge, so respondents often find it difficult to describe more complex aspects of their work and the nature of their expertise.

Most respondents still equate learning with formal education and training, and assume that working and learning are two quite separate activities that never overlap, whereas our findings have always demonstrated the opposite, i.e. that most workplace learning occurs on the job rather than off the job.

Another important aspect of our methodology has been an increasing awareness of possible answers to our three research questions as our research programme has progressed. We regard this as increasing our sensitivity to certain possible, but not necessarily probable, types of knowledge, learning or influential factors, and thus enabling us not to conduct an interview in a manner that might preclude certain possible types of evidence emerging, and not to fail to recognize such evidence in our field notes or transcripts. Since the range of contexts in which we research is very wide, there is little danger of our having expectations strong enough to cause researcher bias. This is also safeguarded by cross-examination within a very multi-disciplinary

Table 1. A typology of informal learning

Time of focus	Implicit learning	Reactive learning	Deliberative learning
Past episode(s)	Implicit linkage of past memories with current experience	Brief near-spontaneous <i>reflection</i> on past episodes, events, incidents, experiences	<i>Discussion</i> and <i>review</i> of past actions, communications, events, experiences
Current experience	A selection from experience enters episodic memory	<i>Noting</i> facts, ideas, opinions, impressions; <i>asking</i> questions; <i>observing</i> effects of actions	<i>Engagement</i> in decision making, problem solving, planned informal learning
Future behaviour	Unconscious expectations	<i>Recognition</i> of possible future learning opportunities	<i>Planning</i> learning opportunities; <i>rehearsing</i> for future events

research team, and by respondent validation of the interview reports that provide our evidence (see Eraut *et al.*, 2003).

### The nature of informal learning

Since I deplore dichotomies as indicators of lazy thinking, I prefer to define informal learning as learning that comes closer to the informal end than the formal end of a continuum. Characteristics of the informal end of the continuum of formality include implicit, unintended, opportunistic and unstructured learning and the absence of a teacher. In the middle come activities like mentoring, while coaching is rather more formal in most settings. A slightly modified version of Eraut's (2000) typology of informal learning is presented in Table 1.

The columns in Table 1 distinguish between three levels of intention. *Implicit learning* is defined by Reber (1993) as 'the acquisition of knowledge independently of conscious attempts to learn and in the absence of explicit knowledge about what was learned'. I will also argue below that most learning from experience has some implicit aspects, and that awareness of explicit learning does not mean that implicit learning is not also taking place. Moreover, outside formal education and training settings, explicit learning is often unplanned. Hence I make a distinction between reactive or opportunistic learning that is near-spontaneous and deliberative learning that is more considered. I use the term '*reactive learning*' because, although it is intentional, it occurs in the middle of the action, when there is little time to think. In contrast, *deliberative learning* includes both 'deliberate' learning (Tough, 1971), where there is a definite learning goal and time is set aside for acquiring new knowledge, and engagement in deliberative activities such as planning and problem solving, for which there is a clear work-based goal with learning as a probable by-product. Because most

of these latter activities are a normal part of working life, they are rarely regarded as learning activities, even though important learning often occurs.

The three rows indicate the possible temporal relationships between a learning episode and the experiences that gave rise to it. Schön (1983) distinguishes between reflection during an action and reflection after an action, but tends to confuse the context of reflection with its focus (see Eraut, 1995). In Table 1 the context in which learning occurs is always the present, but the focus of the learning can be in the past, present or future. While the planning of future learning opportunities is often informal, the opportunities themselves could be either formal or informal. My terminology is open to challenge because I had to give priority to finding terms for aspects of reactive learning, which is rarely mentioned in the literature. Hence I used 'discussion' and 'review' for deliberating on the past, when I could have used 'reflection' in the form advocated by Dewey (1933).

### **Deconstructing learning from experience**

When appropriately prompted in an interview, respondents will begin to talk about learning from experience; but what does that mean in practice? First, we need to consider what counts as experience. Most of the education literature focuses on the process of reflection on experience, with scant attention to the nature of experience itself. The frequently cited learning cycle of Kolb and Fry (1975) is confusing. Not only does it refer to 'concrete experience', which excludes the feelings associated with even the shortest of episodes (Boud *et al.*, 1985), but it also refers to 'observations and reflections' in a manner that appears to privilege the meaning of 'an observation as an idea' over that of 'observation as a process of sensory reception'. Part of the problem is that when we refer to 'an experience' we are probably thinking about a single episode or incident, but when we talk about what we have learned from 'experience in general' we are probably referring to our accumulated learning from a series of episodes.

Schutz (1967) points out that each of us is embedded in a continuous flow of experience throughout our lives. Discrete experiences are distinguished from this flow and become meaningful when they are accorded attention and reflected upon. The 'act of attention' brings experiences, which would otherwise simply be lived through, into the area of conscious thought, where treatment may vary from actual comprehending to merely noting or hardly noticing. Such attention may be given on a number of occasions, each conferring a different meaning on the experience according to the meaning-context of the moment.

A parallel account might describe a set of impressions being extracted from the flow of experience and committed to long-term memory with or without further reflection. Concurrent or later attention to this set of impressions may treat them as constituting an event or episode and link them to other episodes construed as related, possibly even to thoughts about those episodes. As Schutz suggests, there are many linkage possibilities for any one episode, each conferring upon it a different meaning and significance. For example, an episode forming part of a normal working day may, if given appropriate attention, provide information about a colleague or a work situation

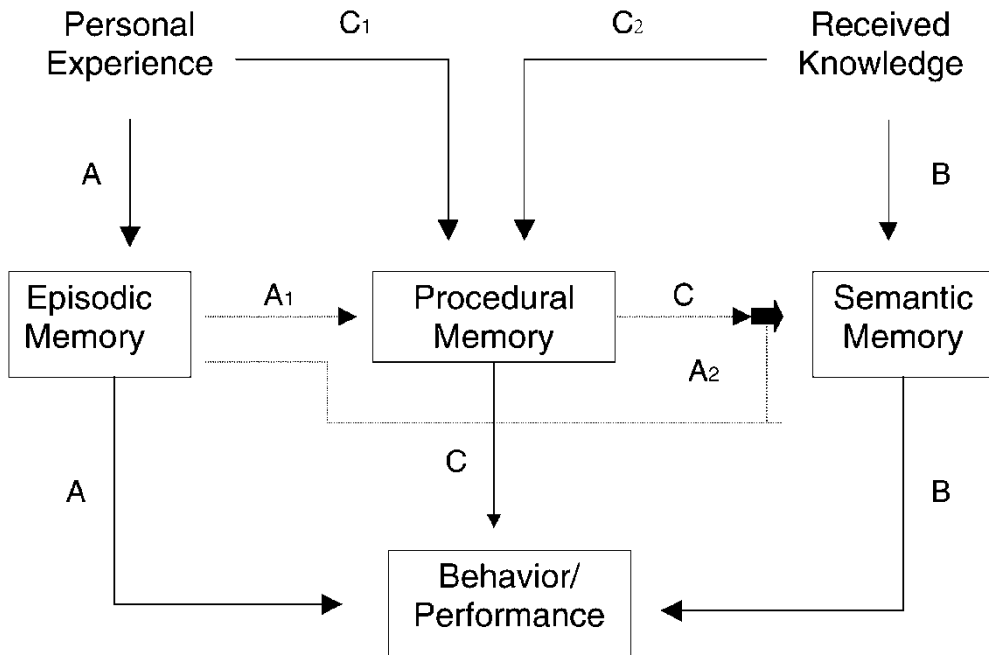


Figure 1. Memory structures and knowledge acquisition pathways in a cognitive model of tacit knowledge (Sternberg *et al.*, 2000)

that later proves useful; and a succession of such episodes could build up a significant picture of the person or situation under attention.

Sternberg *et al.* (2000) represent this situation diagrammatically in Figure 1, using Tulving's (1972, 1995) theory of memory, which distinguishes between episodic, semantic and procedural memory. *Episodic memory* is for specific, personally experienced events—the episodes that make up one's experience. *Semantic memory* is for explicit verbal knowledge—general information that transcends particular episodes—and can be acquired either through formal teaching or private study (path B), or through reflection on episodes from experience (path A2). *Procedural memory* is for 'specific condition–action pairings that guide a person's actions in a given situation'. These procedures may be acquired by experience alone (e.g. riding a bicycle) or by formal teaching (e.g. multiplication). After a while, individuals learn to follow such procedures without having to stop and think about what to do next. Sternberg *et al.* define knowledge acquired by paths A1 and C1 as tacit knowledge, which is not readily articulated, and argue that such tacit knowledge confers advantages over taught procedures because it has already been contextualized. Taught knowledge, on the other hand, is based only on other people's experiences and, being decontextualized, is not yet readily available for use.

I support Tulving's theory and the attribution of tacit knowledge to pathways A1 and C1, but not the treatment of tacit knowledge as only a sub-branch of procedural

knowledge. Although Sternberg *et al.* include single decisions and actions within their definition of procedural knowledge, this still leaves the problem of how we classify knowledge acquired from experience that does not lead to rapid decisions or actions. My own position is that people may assess situations almost instantly by pattern recognition, less rapidly by drawing on their intuitive understanding of the situation, or more deliberately by using reflection and analysis (as shown in Table 2 on p. 260). Intuitive understanding signifies some familiarity with most or all aspects of the situation, but cannot be described as procedural knowledge if it does not lead to rapid decisions. This could be either because no sensible options readily come to mind or because the level of risk suggests that the original understanding should be checked before taking any further action. Often this intuitive understanding is not fully recognized until somebody, deliberating between two or more options, expresses a strong preference for one particular option, because they suddenly feel that it fits the situation much better than the alternatives. This is a good example of tacit knowledge that can be used but not articulated, and is depicted in Figure 1 by the bottom half of path A.

There is little obvious resemblance between this intuitive understanding of a complex situation and being able to ride a bicycle. Thus I do not consider tacit knowledge to be a single type of knowledge, but rather an attribute of several types of knowledge.

Reber's (1993) research on implicit learning demonstrated that episodes that are not recalled may nevertheless affect later performance. Hence, it is reasonable to assume that, even when episodes are recalled, information from them may have been used without the actor being aware of it. The intuitive understanding referred to above derives from the cumulative aggregation in memory of the perceptions of many previous episodes. Thus, throughout our lives we make assumptions about people, situations and organizations based on aggregated information whose provenance we cannot easily recall and may not even be able to describe. We instinctively 'know' that a particular action is appropriate. However, because the aggregation process has not been under our conscious control, there is a danger that our selection and interpretation of information from these episodes was biased.

Tacit knowledge is personal knowledge that may be used uncritically because people either believe that it works well for them or lack the time and/or disposition to search for anything better—a common feature of situations where people are overworked or alienated. But in more technical areas, or where more strategic decisions are involved, tacit knowledge is more likely to be used for generating hypotheses or possible sources of action, which are then checked against other evidence or discussed with other people. This behaviour is characteristic of medical diagnosis and decision making in a wide range of naturalistic settings (Klein *et al.*, 1993; Eraut, 2004b).

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 recognizing 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 organized as a result of considerable experience for rapid, efficient and effective use (Schmidt & Boshuizen, 1993).

If we now consider that most of these episodes occur within social contexts, it becomes clear that other social actors may be participating in the same episodes, and contributing through their actions and discourse, both during and after the episodes, their own interpretations of events, and that their contributions may influence what is noticed and/or remembered. Thus the episodic memories of individuals are influenced both by the semi-conscious socialization process through which norms, values, perspectives and interpretations of events are shaped by the local workplace culture, and by their conscious learning from others, and with others, as they engage in cooperative work and tackle challenging tasks.

### **Knowledge acquisition and use in complex situations**

Several types of knowledge are involved in a performance of any complexity, and the natural tendency is to communicate the more explicit aspects and neglect those that are tacit. For example, let us consider how a teacher acquires information about individual pupils in her class. Although teachers receive some information from records and comments from other teachers, their knowledge of individual pupils is based mainly on direct encounters in the classroom. These encounters are predominantly with the class as a group, but nevertheless a series of incidents involving individuals in whole class, small group or one-to-one settings are likely to be stored in memory, rather like a series of film clips. In so far as a teacher has made notes, these are likely to serve as *aide-mémoire* rather than independent sources of information (Becher *et al.*, 1981). How is the information then used? Under conditions of rapid interpretation, teachers will respond to situations on the basis of their current images of the pupils, though these images may themselves have been formed by rapid assimilation of evidence with little time for reflection. Under conditions of deliberative interpretation, the most accessible evidence is likely to be carefully considered, but even that may be a sample of remembered encounters selected for their ready accessibility rather than their representativeness.

Another important feature of memory is that salient, unusual incidents are more easily remembered than everyday behaviour (Nisbett & Ross, 1980), and in classrooms this effect is greater still because an episode is created only when a child captures the teacher's attention. Hence the episodes that form the basis of a teacher's construction of their knowledge of a child are likely to be episodes involving atypical rather than typical behaviour—hardly a good sample for constructing knowledge that is reliable or valid. The Achilles heel of learning from experience is sampling. The problem for professionals, however, is not to exclude such experiential learning—they



would be lost without it—but to bring it under more critical control. This requires considerable self-awareness and a strong disposition to monitor one's action and cross-check by collecting additional evidence in a more systematic manner with greater precautions against bias.

Teachers inevitably get to know some children better than others. Those who are quiet, well behaved and in the middle of the performance range are the least likely to attract a teacher's attention, and possibly more likely to be perceived as members of a group rather than individuals. Perceptual divisions into sub-groups tend to encourage stereotyping and possibly inappropriate expectations, but they simplify classroom organization. When asked to talk about a child, teachers are likely to use a range of common constructs, broad or narrow; but their accounts of episodes often reveal a great deal more. Potentially, there are several levels of knowledge about a child: a simple typology of those attributes more relevant to classroom decision making, a more complex set of constructs, and episodes in memory that carry more information but are less organized and understood. The level used will depend on the time available for reflection and whether decisions concerning the child are being seriously considered.

Rapid reactions to a child's behaviour are more likely to trigger the use of stereotypes than is a peaceful conversation. Generally, the greater the tension in the classroom, and the more such rapid reactions become the normal mode of communication, the more likely it is that teachers will become accustomed to using less elaborate forms of knowledge about pupils. This will reduce the incentive to invest in a more complex knowledge base. Instead of trying to use complex 'pictures' of children in busy situations, the temptation will be to rely on early encounters rather than change one's views in the light of new information (Eraut, 2002b).

One counter-influence to this temptation to avoid complexity is the affective, moral dimension of the teacher's role. This suggests that getting to know a child better is part of the implicit contract between a child and a responsible teacher, or indeed any relationship between human beings who work together. I will argue below both that relationships play a critical role in workplace learning, and that the emotional dimension of professional work is much more significant than normally recognized. Once more the scarcity of time has a huge impact. If there is no time to invest in getting to know people, misjudgements are likely to become rife.

Another example comes from my earlier research into the use of scientific knowledge by nurses and midwives (Eraut *et al.*, 1995). We were interested both in the nature of this expertise and in the manner of its acquisition, and focused on six topics with varying proportions of science and social science content: fluids and electrolytes, nutrition, acute pain, shock, stress and self-esteem. To analyse our data, comprising accounts of incidents in which this knowledge had been used recently, we developed a series of knowledge maps that had aspects of scientific knowledge on one dimension and nursing and midwifery activities along a second dimension, thus indicating which areas of knowledge were used when. It was not too difficult to get reasonable agreement from experienced professionals, allowing for contextual variation, about what knowledge was relevant and when, but describing how it was

used was much more difficult. Our respondents had worked out what ought to be done over a period of time and were aware that certain areas of knowledge underpinned their practice, but often hit a blockage when trying to explain exactly how the knowledge justified their decision. In many cases this might have been explained by a process of forgetting: once they had a lot of experience in that area they worked by pattern recognition and finding appropriate scripts and no longer referred back to the scientific knowledge. But we feel that two other phenomena were also at work. First, in order to use a scientific concept in a practical situation it had to be transformed or resituated in a form that fitted the situation, and this was not a process of logical reasoning that could easily be retraced but rather one of mulling over the situation until something seemed to fit. Second, in most situations several different areas of knowledge had to be combined, creating a problem-solving situation resolved by insight, which again could not be explained easily. Hence we have the paradox of professionals being able to refer to codified, scientific knowledge in clear explicit terms, yet using that knowledge in ways that are still largely tacit.

One further important conclusion from this work was the recognition that the transfer of knowledge from education to workplace settings is much more complex than commonly perceived (Eraut, 2004a). Typically, it involves five interrelated 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. recognizing 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.

The whole process is much more complicated than just desituating and resituating a single piece of knowledge.

Higher education defines its interest in terms of transferring *its* knowledge, whose significance is taken for granted, and will, at most, attend to stages (1) and (3). The workplace may give some attention to stage (3) and generally takes stage (2) for granted. It expects knowledge from higher education to be 'ready to use' and questions its relevance if it is not. Thus both cultures not only ignore the very considerable challenges of stages (4) and (5) but deny their very existence! Such is the common fate of tacit knowledge.

### **The holistic nature of performance**

The final stage in the transfer process described above draws attention to the holistic nature of performance in most workplaces. Even when an observed period of performance can be broken down into successive phases, each phase still requires

several different types of knowledge and skill, whose relative importance may vary from one situation to another. Apart from noting occasional pauses in the action, the observer sees a fluent, unfolding sequence of events, whose most remarkable feature for those who do not take it for granted is the integrated and adaptive use of many different kinds of knowledge and skill. This raises some important questions about learning. To what extent is it possible to learn component knowledge and skills separately from the whole performance? If so, how authentic are the components, and is it the most effective approach? Then, finally, if it is possible to learn the components separately, does that constitute the major part of the learning effort or is the integration and adaptation of those components the greater, and more time-consuming, learning challenge? In practice, there are many possible hybrid approaches, and the balance between components and whole performance will vary across different kinds of work; but the learning of holistic performance is often much less supported than components that can be learned off the job.

These problems of integration, fluency and adaptation can be appreciated if we examine a performance period (Eraut, 1994) like that presented schematically in Figure 2. The period chosen for analysis will vary according to the focus and the occupation; for example, one could consider a lesson, a clinic, a shift or a day. A major aspect of professional experience is that many tasks do not get completed during a performance period, so there is the constant problem of 'picking up the threads' at the beginning or receiving new information that will cause a change of plan; then there is the need to record progress at the end and/or to hand over clients to a colleague. This is reflected in the separate boxes for *Initiation* to indicate the initial briefing and reading of the situation when the period starts, and for *Ending* to indicate what has been achieved, or left undone, by the time the period ends.

One advantage of using a performance period is that situations often develop over time. So, instead of a static model in which all decisions and plans are made at the beginning of a period, one has a dynamic model in which a constantly changing environment provides a changing input that leads to the constant modification of plans. The input side is shown by placing the activities within a context characterized by changing conditions and a developing situation, with the opportunity for inputs prompted by sensing and listening. A great deal of competent behaviour depends not only on being able to do certain things (output) but also on the correct reading of the ongoing situation (input) so that the appropriate action can be taken. Nor is it only the external environment that changes of its own accord. The performer is an actor who affects that environment, not always in totally predictable ways. So another role of input is to provide feedback on the effect of one's own performance. This applies whether one is making something and sensing it change, or talking to people while listening to their reply and observing their reaction.

The interpretation of this input is just one aspect of the central column marked *Thinking*. Other aspects of thinking include planning and monitoring one's activities and solving problems. People are constantly thinking and making decisions as they go along, even though they could probably tell you very little about it afterwards. Hence *Thinking* is shown in constant interaction with *Doing* and *Communicating*. These

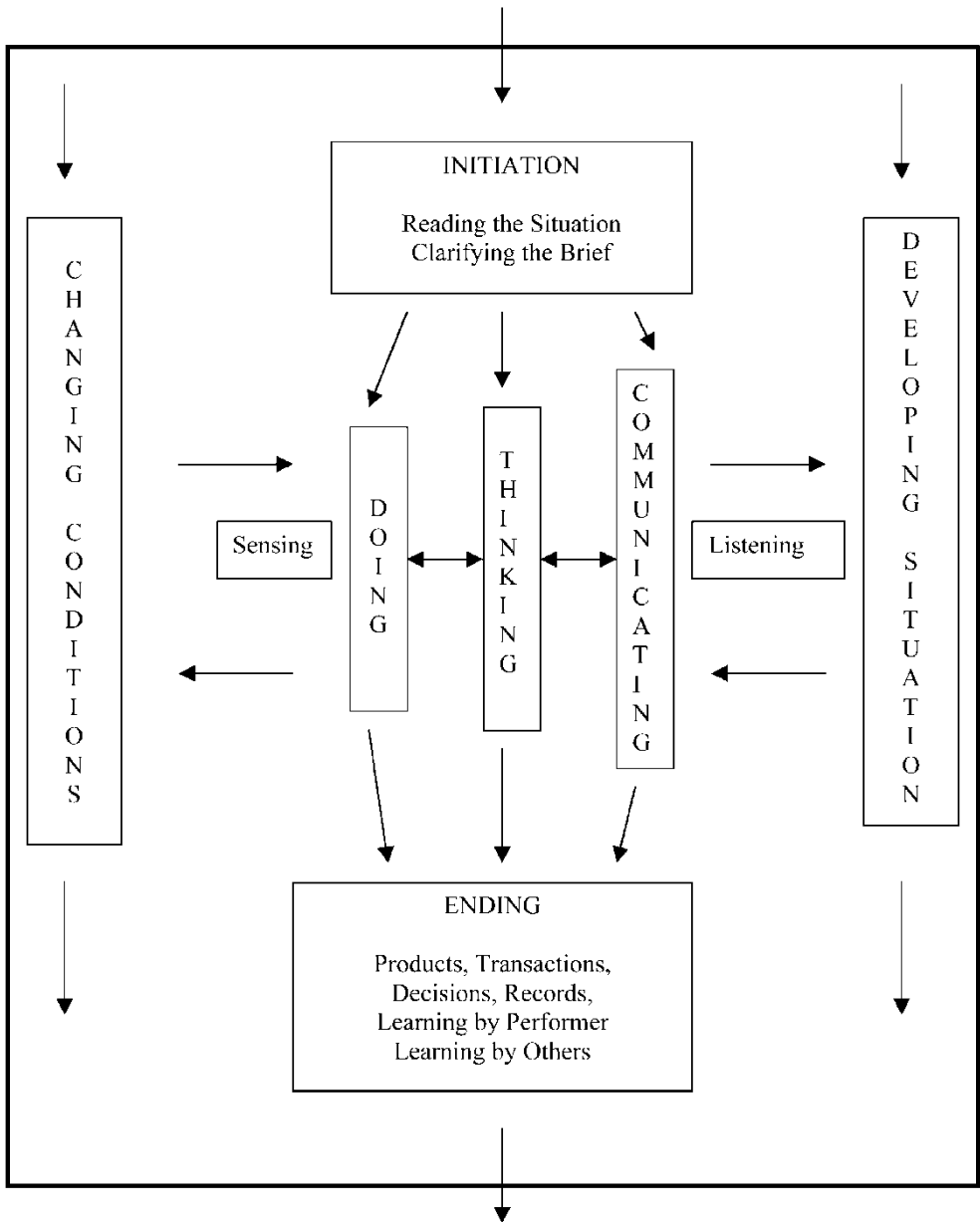


Figure 2. Activities during a performance period

activities overlap to some extent, the main distinction being between acting on inanimate objects and interacting with other human beings. In ‘hot action’ contexts such as a school classroom or a hospital ward, changing conditions feature prominently; in ‘cold action’ contexts changes are more likely to result from the performer’s own actions or the discovery of new information than from extraneous events.

When people talk about evidence-based practice or assessing practice, their assumption is that practice is what they can observe. However, the above analysis suggests that practice might be more usefully described in terms of a person or a team's capability; because this highlights what performers bring to the situation that enables them to do what is observed, much of which is invisible. This implies that practice can only be thoroughly investigated by the co-construction of accounts of periods or episodes by observer(s) and performer(s). This can be greatly facilitated by the use of visual, audio or video records and a relationship of high mutual trust that takes time to develop (see Fessey, 2002a, b, for a detailed methodological account of eliciting the practical knowledge of expert surgical nurses). Performance, therefore, cannot be well understood by disengaged novices, trainers or researchers.

### **Factors affecting modes of cognition in workplace performance**

Throughout this paper there have been references to the pace and pressure of the workplace, which raise the question of when and how workers find the time to think. My response to this conundrum has been a model that links four types of professional activity to different amounts of thinking time (Eraut, 2000), and uses this framework to examine the *modes of cognition* employed in professional work (see Table 2). The four types of activity were:

1. assessing clients and situations (sometimes briefly, sometimes involving a long process of investigation) and continuing to monitor their condition;
2. deciding what, if any, action to take, both immediately and over a longer period (either on one's own or as a leader or member of a team);
3. pursuing an agreed course of action, modifying, consulting and reassessing as and when necessary;
4. managing oneself, one's job and one's continuing learning in a context of constrained time and resources, conflicting priorities and complex inter- and intra-professional relationships.

These activities can take many different forms according to the speed and context 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 a simple sequence of assessment, decision and then action. For example, a health professional will often have to decide whether to take action and then reassess whether to continue with a further assessment of their client or whether simply to wait and see. There may be several assessments, decisions and actions within a single period of consultation and treatment. Indeed, recording both the nature of these activities and the ways in which they are sequenced and combined is another very useful approach to describing professional practice.

In order to understand the nature of workplace performance, one has to examine the thinking entailed in carrying out these activities, which depends on both (1) the conditions and constraints on the performer, and (2) what the

Table 2. Interactions between time, mode of cognition and type of process

Type of process	Mode of cognition		
	Instant/reflex	Rapid/intuitive	Deliberative/analytic
Reading of the situation	Pattern recognition	Rapid interpretation	Review involving discussions and/or analysis
Decision making	Instant response	Intuitive	Deliberative, with some analysis or discussion
Overt activity	Routinized action	Routines punctuated by rapid decisions	Planned actions with periodic progress reviews
Metacognitive	Situational awareness	Implicit monitoring; short, reactive reflections	Conscious monitoring of thought and activity; self-management; evaluation

performer has learned to do, with or without stopping to think. Sometimes the situation itself demands a rapid response; sometimes rapid fluent action is the hallmark of the performer's proficiency; sometimes the number of activities proceeding simultaneously limits the attention that can be given to any of them, i.e. the workload is so heavy that there is little time to think. Thus the model assumes that *time* is the variable that most affects *mode of cognition* and divides the time-continuum into three sections, headed Instant, Rapid and Deliberative. These terms attempt to describe how the timescale is perceived by the performer, and are interpreted differently according to the orientations of performers and the nature of their work. For example, in one context *rapid* might refer to any period less than a minute, while in another context it might include periods of up to 10 minutes or even half an hour. The critical feature is that the performer has little time to think in an analytic mode.

The *instant/reflex* column describes routinized behaviour that, at most, is semi-conscious. The *rapid/intuitive* column indicates greater awareness of what one is doing, and is often characterized by rapid decision making within a period of continuous, semi-routinized action. Typically, it involves recognition of situations by comparison with similar situations encountered previously, then responding to them with already learned procedures. The time available affects the degree of mismatch that is tolerated, because rejection of action based on precedent leads to deliberative problem solving and hence to a more time-consuming approach. The *deliberative/analytic* column is characterized by explicit thinking about one's actions in the past, present or future, possibly accompanied by consultation with others. It involves the conscious use of prior knowledge, sometimes in accustomed ways, sometimes in novel ways or in a more critical manner.

The relationship between time and cognition is probably interactive: shortage of time forces people to adopt a more intuitive approach, while the intuitive routines developed by experience enable people to do things more quickly. Crowded contexts also force people to be more selective with their attention and to process their incoming information more rapidly. Under conditions of rapid interpretation and decision making, 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, and so on.

Even when there is no emergency, experienced people typically prefer to do many things quickly and smoothly if they are confident in their own proficiency. However, there are also situations in which speed beyond what even proficient workers consider appropriate is forced by pressure for productivity. Then quality falls, the level of risk is higher and job satisfaction plummets. Both the development of proficiency and learning to cope with pressures for rapid action involve routinization and further work; but whereas the routines associated with proficiency lead to improvement in both quality and productivity, coping routines increase productivity at the expense of quality. In either case, routinization 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 take shortcuts without being aware that they are reducing their effectiveness.

The greatest benefit of routinization is that it frees practitioners' attention for monitoring what are often rapidly changing situations and for taking a more meta-like perspective on their action. 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 adopt a more evaluative perspective on their practice. In many cases it is too difficult to disentangle routines from the practice in which they are embedded to attempt either to describe them or evaluate them. Indeed, both description and evaluation threaten to diminish the utility of routines, which depends on being confident 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 one's 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, but 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 practice when one's tacit knowledge ceases to provide the necessary support; and the emotional dimension is also of considerable importance. The common assumption that change is partly a problem of 'attitude' and partly a process of learning new explicit knowledge is deceptive and fallacious.

If routines are a fast version of overt activity from which the need to stop and think has been removed, the fast version of decision making is what is frequently described



as rapid and intuitive. People are able to make such decisions because they recognize the situation quickly and 'know what to do' as a result of their prior experience. What Klein (1989) described as recognition-primed decision making and we describe as situational recognition are similar in their emphasis on the intuitive use of prior experience rather than explicit use of codified knowledge in a problem-solving mode.

This contrast between idealized images of knowledge use and typical reality might be expected to diminish as more time becomes available and more deliberation takes place. But research into real-life decision making and problem solving does not suggest a move towards the classical decision-making model, involving choice from among a fixed set of known alternatives based on stable goals, purposes and values (Klein *et al.*, 1993). Instead, it suggests that: 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 still exist; stakes are high; many participants contribute to the decisions; and the decision maker must balance personal choice with organizational norms and goals (Orasanu & Connelly, 1993, pp. 19–20).

The research also demonstrates that reasoning is 'schema driven' rather than algorithmic, as assumed by computer-supported decision analysis in the classical mode:

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, p. 18)

The implications for knowledge management systems 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 and less towards the codified knowledge management system than might be implied by classical decision-making theory. If there is very little time or several competing decisions, any consultation of the knowledge management system would be brief and undertaken only if there was a high expectation of getting a valuable pay-off almost immediately.

More general conclusions can also be drawn. Either an organization adopts a knowledge management system whose scope is confined to codified knowledge (including information not publicly available), in which case the problems of knowledge coverage and knowledge of how to use the codified knowledge in new situations will be a major constraint, or else it also tries to 'capture' wider areas of cultural and personal knowledge that are less amenable to transformation into computer-based form. Significant parts of that knowledge are 'tacit' and less

susceptible to capture than many writers on this theme imply. Perhaps the best known are Nonaka and Takeuchi (1995), who attributed a series of high-profile successes by Japanese manufacturers to companies' ability to convert the tacit knowledge of their employees into explicit knowledge. However, careful reading of their text suggests that most of the knowledge they describe was already explicit; it was personal knowledge that had not previously been considered relevant or shared with others. This does not devalue the interest of their book, which demonstrates the value of pooling different kinds of personal knowledge through social interaction. But attempts to share or capture tacit knowledge require rather more sophisticated approaches (Eraut, 2000; Fessey, 2002a).

### **What is being learned?**

This was our first research question. The import of this paper is that a much broader and more flexible approach to representing the outcomes of learning is needed, if we are to handle the wide variety of kinds of expertise and the holistic nature of most performance at work. However, before describing our progress to date, I will explain my position on the contested concepts of knowledge, skills and competence that normally dominate such discussions. Both knowledge and learning can be examined from two perspectives, namely the individual and the social. These can be considered as analogous to the particle and wave theories of light. An individual perspective on knowledge and learning enables us to explore both differences in what and how people learn and differences in how they interpret what they learn. A social perspective draws attention to the social construction of knowledge and of contexts for learning, and to the wide range of cultural practices and products that provide knowledge resources for learning. In formal higher education, the most prominent of these resources are the codified academic knowledge embedded in texts and databases and the cultural practices of teaching, studentship, scholarship and research. *Codified knowledge* that is not academic can be found in nearly all workplaces, including those of educational organizations, in the form of textual material containing organization-specific information, records, correspondence, manuals, plans, etc.

*Cultural knowledge* that has not been codified plays a key role in most work-based practices and activities. There is considerable debate about the extent to which such knowledge can be made explicit or represented in any textual form, and the evidence gathered so far suggests that its amenability to codification has been greatly exaggerated (Eraut, 2000). What does appear to be generally acknowledged is that much uncoded cultural knowledge is acquired informally through participation in social activities, and much is often so 'taken for granted' that people are unaware of its influence on their behaviour. This phenomenon is much broader in scope than the implicit learning normally associated with the concept of socialization. It is a prominent feature of educational institutions despite the overt dominance of codified academic knowledge, and it occurs in both formal and informal settings.

As a counterpart to cultural knowledge, I define *personal knowledge* as what individuals bring to situations that enables them to think, interact and perform.

Codified versions of personal knowledge are associated with the concept of authorship, and provide the basis for assignments and assessments within educational programmes from which more than the replication of publicly available knowledge is expected. But my definition is intended to include non-codified personal knowledge and a far broader concept of knowledge than academic performance. For example, it includes not only personalized versions of public codified knowledge but also everyday knowledge of people and situations, know-how in the form of skills and practices, memories of episodes and events, self-knowledge, attitudes and emotions. Moreover, it focuses on the use value of knowledge rather than its exchange value in a world increasingly populated by qualifications. This implies a holistic rather than fragmented approach to knowledge because, unless one stops to deliberate, the knowledge one uses is already available in an integrated form and ready for action.

Skills can be considered as both a form of cultural knowledge and a form of personal knowledge, according to the focus of attention. The term also tends to be used at two levels. One level is used to describe actions believed to be based on procedural memory alone, although the knowledge needed to decide when to use that skill will include situational understanding, which is not a skill. Such skills are most likely to be classified in our typology under Task Performance (see Figure 3). The other level of usage relates to processes, which are constructed from a mixture of procedural knowledge and other forms of knowledge. There are several such entries in sections of our typology, including those under Teamwork, the use of evidence and argument, and decision making under pressure.

Competence is more complicated because in North America and in management it has an individual-centred definition and refers to a personal attribute or quality, while elsewhere it has a social-centred definition and refers to meeting social expectations. I prefer to stay with the, often implicit, definition of competence as meeting other people's expectations. Precisely whose expectations are to count will depend on local micro-politics. The importance of this definition is that it recognizes the everyday role of the notion of 'competence', both in the workplace and as a mediating concept between (1) professionals and technicians and (2) their clients and the general public. Although lists of competences carry general understanding within an occupational sector, judgements of competence are still very situation specific. Not only does this specificity derive from the context of the performance but it also covers the expectations of each individual performer. Irrespective of any relevant qualifications, expectations will differ according to the performer's experience, and sometimes also according to the price of their service. One role of most managers is to ensure that their workers do not get assigned to tasks beyond their competence. The ideal work situation for apprentices allows them to consolidate their competence through further practice, while also expanding their competence through a combination of peripheral participation and coaching. However, even for experienced workers, what counts as competence will change over time as practices change and the speed and quality of work improves. Thus, from a learning viewpoint, competence is a moving target.

Figure 3 presents the typology (Eraut *et al.*, 2004a) we have developed to guide our research, following ongoing consultations with our research participants and partner

### **Task Performance**

Speed and fluency  
Complexity of tasks and problems  
Range of skills required  
Communication with a wide range of people  
Collaborative work

### **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

### **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

### **Teamwork**

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

### **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

### **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)

### **Decision Making and Problem Solving**

When to seek expert help  
Dealing with complexity  
Group decision making  
Problem analysis  
Generating, formulating and evaluating options  
Managing the process within an appropriate timescale  
Decision making under pressurised conditions

### **Judgement**

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

Figure 3. What is being learned in the workplace? (Eraut *et al.*, 2004a)

organizations. Although presented as a typology, we view it more as a heuristic for use in research and consultancy that reminds people of possible aspects of learning in their own context. Not all the descriptors are specific to a single heading, so we have chosen the heading we find most suitable. We hope that people will find it a useful starting point for developing a typology for their own workplace. Our descriptors are readily recognizable as having workplace authenticity and significance, but few of them comprise only skill or only codified knowledge because, as argued above, these

categories do not match attributes of performance at work. Some descriptors feature in lists of competences, but few of them can be assessed by a simple binary judgement of 'competent' or 'not competent'. Even if this were to be converted to a continuum, their positioning on such a scale would probably be unreliable.

Most aspects of performance continue to be developed by further learning throughout one's career. We therefore prefer to describe our typology as a progression typology, and to see a person's current position on each aspect as a point on a lifelong learning trajectory. We also anticipate that at any one stage in a person's career, there will be both a group of learning trajectories along which they are explicitly and intentionally progressing and another group along which they are implicitly and unintentionally progressing; and that the composition of these groups will change over time. Hence our typology could be used as a template for planning, prioritizing, recoding or reviewing professional development.

Finally, two important cautions should be made. The first is to remind readers that using an intelligible descriptor does not increase the explicitness of the knowledge entailed; most entries in Figure 3 have significant tacit components. The second is not to assume that accepting the socio-cultural origin of knowledge implies that individuals in a working group, pursuing practices that appear to have a similar object, have a similar knowledge base or fine tune their practices for clients in similar ways. Particularly when there is little mutual observation, the discourse of practice serves its manifest function of sharing practical knowledge only at a fairly superficial level. Its latent function is often to protect individual practitioners from criticism and to maximize their autonomy (Eraut, 2000). How often does the 'accolade' of being described as a 'community of practice' go beyond wishful thinking (Eraut, 2002a)?

### How is it being learned?

My second research question has been as challenging as the first, because so much learning goes unrecognized. Recently, our methodology and analysis have been helped by a simple conceptual framework for distinguishing between different kinds of learning when several things are happening at once. In examining conscious learning processes we found it useful to make two distinctions. First, we separated normal working processes, during which learning occurred, from processes in or near the workplace, which were introduced with learning as their prime purpose. Second, we then distinguished between processes of some length, from a few hours to days or even months, and the specific learning activities, which were often embedded in such processes.

We found four main types of work activity that regularly gave rise to learning:

- *Participation in group activities* included teamworking towards a common outcome, and groups set up for a special purpose such as audit, development or review of policy and/or practice, and 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.

- *Tackling challenging tasks* requires on-the-job learning and, if well-supported and successful, leads to increased motivation and confidence.
- *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 arose from their joint consultation.

These four processes accounted for a very high proportion of the reported learning of people we interviewed during our various projects (Eraut *et al.*, 1998, 2004b). Their success also depends on the quality of relationships in the workplace. For this and other reasons the amount of learning reported varied significantly with person and context, raising important questions about appropriate intervention strategies for enhancing the quality and quantity of informal learning, to which we will return at the end of this paper.

Arrangements for supporting learning were responsible for a range of other learning processes, some of which were directed only at new workers or novices, while others were more generally available. Formal training and knowledge resources such as manuals, reference books, documentation, protocols and an intranet were generally available to all workers, whereas apprentice-type arrangements were offered only to trainees. Mentoring was normally confined to new arrivals or trainees, as were supervision and coaching, though coaching was sometimes provided for more experienced workers for newly introduced technical practices, including new information technology. Of particular interest to us was the balance between support provided by people on the spot when, or soon after, the need first became apparent, and support from a designated mentor or manager. We encountered many contexts where informal support from whoever was available was more important for learning than were formally designated helpers (Eraut *et al.*, 2004b).

Most learning activities were embedded within the processes described above to a greater or lesser degree. These included formal study, listening, observing, reflecting, practising and refining skills, trial and error, supervision or coaching, and mentoring. Problem solving could occur in either an individual or group context, and also when working directly with clients. Sometimes it was just an embedded activity, but it could also be a major task for a considerable period of time. Other activities were not always so embedded. Learning from mistakes is possible in most working contexts. Getting information and asking questions were important modes of learning that stretched beyond the usual cluster of immediate colleagues. Some workers were very proactive in seeking out and developing relationships with a wider network of knowledge resource people, while others gave it little attention. Giving and receiving feedback were important, often vital, for most learning processes. We found that learners needed both short-term, task-specific feedback and longer-term, more strategic feedback on general progress. Interestingly, 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 *et al.*, 2004b).

Once more, a note of caution must be added. In reporting the comparatively large proportion of informal learning occurring in the workplace it would be a mistake to believe that learning in the workplace often approaches its potential. A typical work group comprises a changing set of individuals who spend varying periods of time within it. These individuals come from and go on to other groups, sometimes within the same organization, sometimes not. Each has a distinctive learning career that can be traced through a sequence of work groups: in some groups it flourishes, in others it stagnates or regresses. This depends on how much group members learn from each other, to what extent individuals of the whole group respond to the challenges of their work and support each other, and what additional learning opportunities for the group are located and developed. Many groups discourage finding out about the knowledge resources and networks of new members, regard external contacts and learning opportunities as diversions from their work, and do not seek to learn from diversity of experience or perspective.

Our analysis suggests that a group climate for learning has to be created, sustained and re-created at regular intervals, and that when mutual learning is low and relationships are dominated by suspicion this has to be a management responsibility. This does not mean that the managers have to do this on their own; in some contexts that could be counter-productive. They have to work on the climate with members of the group, and the learning of individuals and work groups has to be high on managers' agendas. The half-life of working groups is decreasing in many contexts, so few groups are sufficiently stable and coherent to develop a positive learning climate quickly and spontaneously. Our evidence suggests that management styles and local workplace climates affect learning, retention and quality improvement in similar ways. Hence, managers have to be educated and supported for this role. Surprisingly, this aspect of management capability is very rarely found in management development programmes.

### **Factors affecting learning in the workplace**

Our approach to this final research question is based on an important theoretical assumption, namely that we are unlikely to reach conclusions about cause and effect that are generalizable across a wide range of working contexts. Hence, our approach has always been to search for factors that affect learning, either directly or indirectly, in a large number of contexts but to assume that their relative significance and the ways in which these factors interact will differ greatly from one context to another. The message for users and other researchers is that of sensitizing them to possible factors and combinations of factors and the kinds of effects they may have, while also warning them that they need to collect good evidence from their own context before drawing any firm conclusions. Since many effects are quite local, this could mean developing an informal self-evaluation capacity in local workplaces. Such efforts



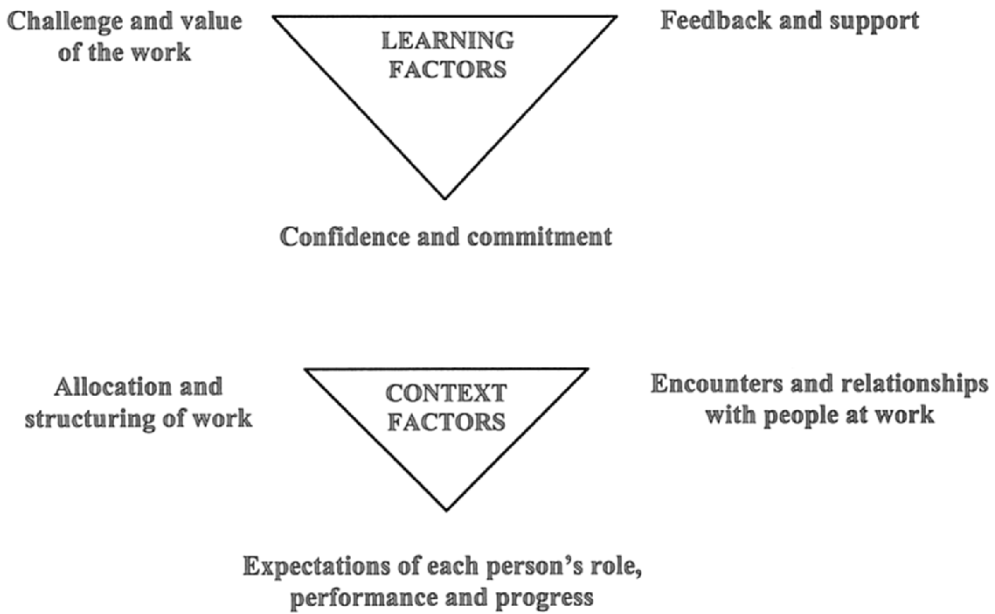


Figure 4. Factors affecting learning in the workplace

should be a good investment, because they will also have a positive impact on retention, innovation and quality improvement.

Our conclusions can be summarized by two similar triangles, depicting the work context for learning and the main factors that influence learning within that context (see Figure 4). The first thing that struck us in our interviews with both novices and experienced workers in mid-career 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. Thus there is a triangular relationship between challenge, support and confidence (Eraut *et al.*, 2000). If there is neither a challenge nor sufficient support to encourage a person to seek out or respond to a challenge, then confidence declines and with it the motivation to learn. 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 (1982) concept of *self-efficacy*—a context-specific concept relating to the ability to execute a particular task or successfully perform a role. It is not a general attribute like 'self-esteem'. For some mid-career respondents, however, confidence related more to relationships than to the work itself. Did they feel confident about the support 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.

We then added a further element to each apex of this triangle to reflect other factors that emerged from our data: *feedback*, because we found that this was more than just one form of support, and was, or needed to be, provided by people who were not seen as having any particular support role; the *value of the work* (both for clients and for career progress) as an additional motivating factor; and *commitment*. Given our focus, commitment to learning was soon recognized as a complementary factor to confidence, which affects the extent to which workers are proactive in taking advantage of the learning opportunities available to them. However, we also found that commitment to clients, colleagues, their work group and their organization were sometimes important factors that could not be taken for granted. *Commitment* is generated through social inclusion in teams and by appreciating the *value of the work* for clients and for the workers themselves. Moreover, concerns about career progress that arise from inadequate *feedback* of a normative kind can weaken motivation and reduce commitment to the organization.

The second triangle mirrors the first triangle but focuses on broader contextual factors. In each triangle the left apex relates to the work itself, the right apex to relationships at work and the lowest apex to the individual worker.

*The allocation and structuring of work* was central to our participants' progress, because it affected both (1) the difficulty or challenge of the work and the extent to which it was individual or collaborative, and (2) the opportunities for meeting, observing and working alongside people who had more or different expertise, and for forming relationships that might provide feedback, support or advice. For novice professionals, in particular, a significant proportion of their work needs to be sufficiently new to challenge them without being so daunting as to reduce their confidence; and their workload needs to be at a level that allows them to reflectively respond to new challenges, rather than develop coping mechanisms that might later prove to be ineffective. There are also likely to be competing agendas when tasks are allocated. People are more efficient at tasks where they already have considerable experience, but may also need to be involved in a wider range of tasks in order to extend their experience. Thus managers and/or senior colleagues have to balance the immediate demands of the job against the needs for workers to extend their capability.

Detailed descriptions of how these factors combine to influence the workplace learning of trainee accountants, graduate trainee engineers and newly qualified nurses can be found in Eraut *et al.* (2004b).

We found communication about allocation of work and *expectations of performance and progress* to be precariously weak in some workplace settings, and constructive feedback on *performance* to be less than optimal in the majority. Whether or not we are looking at early career or mid-career workers, our research evidence indicates that learning at work is either facilitated or constrained by (1) the organization and allocation of work and (2) relationships and the social climate of the workplace. The

informal role of managers is probably more important for this purpose than their formal role, and people's learning at work is greatly affected by the personality, interpersonal skills and learning orientation of their manager.

It follows that of all the mechanisms used at organizational level to promote learning the most significant is likely to be the appointment and development of its managers (Eraut *et al.*, 1999). However, while approaches to management development normally emphasize motivation, productivity and appraisal, comparatively little attention is given to supporting the learning of subordinates, allocating and organizing work, and creating a climate that promotes informal learning. This imbalance may result from ignorance about how much learning does (and how much more learning might) take place on the job. There are also implications for the selection of people for management roles. In most organizations the practical implications of strengthening informal learning for developing the individual and collective capabilities of employees are not yet widely understood. To appoint managers and develop them for this new role of facilitating learning would be a highly significant move.

A deeper problem may be the dominant policy discourse in both government and work organizations. Problems are treated as well defined and readily soluble, and therefore susceptible to formal, standardized types of training to clearly specified targets. Yet the concepts of a knowledge-based economy and a learning organization derive from recognition of the complexities and uncertainties of the modern world. Public discourse about training not only neglects informal learning but denies complexity by over-simplifying the processes and outcomes of learning and the factors that give rise to it.

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