Higher skills development at work

A Commentary by the Teaching and Learning Research Programme

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The continuing development of new skills and knowledge throughout life is valuable for individuals and essential for the economy. Governments across the world are realising with growing clarity that it is not sufficient to expand universities. Even highly skilled professionals need work structures which allow them to go on expanding their abilities.

This Commentary from the Teaching and Learning Research Programme is based on a wide range of research projects which have examined the development of high-level skills. We believe that it provides a unique, evidence-based insight into good practice in professional development.

This research has shown that there are right and wrong ways of developing professionals at all stages of a career. New graduates entering their first jobs, in occupations from nursing to electrical engineering, need support to turn into full professionals, much of it social and emotional as well as being concerned with the practical use of academic knowledge. Later in their careers, individuals need a wide range of development opportunities that allow them to broaden their careers as well as deepening their knowledge. In many cases, as our work on inter-professional working has shown, they need to find ways of stepping beyond their profession and working with members of other groups whose vocabulary, institutions and career paths may be unfamiliar.

This research shows that although professionals, almost by definition, have a detailed knowledge of some specific field, they can only prosper in the modern world if they regard this knowledge as a basis on which to build, not a canonical body of wisdom that will last them for life. It also sets out detailed requirements for people who have responsibility for the professional development of others. This rare skill is one which many organisations are valuing more and more. We show here that it requires an expansive view in which people are encouraged to see work in its full context, even if the aim is to deliver an apparently modest and specific increase in competence.

This Commentary is the fourteenth in a series from the TLRP which covers every aspect of education from preschool to professional and lifelong learning. They analyse fields such as globalisation as well as more traditional areas of education such as school and university provision. They are intended to set out original and highly applicable research findings in an accessible way. We hope you enjoy this Commentary and welcome your response via our web site.

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Chief Executive
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Introduction: higher skills development at work

Economic competitiveness and future prosperity mean deepening the skills base of the workforce. This is not solely a UK concern, because national and European policies both set targets for a greater proportion of the workforce to achieve higher level qualifications. Despite the obvious link between higher level skills and employability, these skills are often seen too simplistically. Attention is paid to the level of skill people reach rather than the area in which they achieve it. Both government targets and individual progression are perceived in terms of hierarchies. People with different levels of skill, knowledge and understanding, and different development needs, are grouped misleadingly according to the qualification level they have achieved.

This notion of hierarchical skills is enshrined in the UK government's policy of not providing funding support for individuals wishing to engage in programmes leading to Equivalent or Lower Qualifications (ELQ). This strategy has focused attention on the achievement of qualifications rather than on substantive skill development (Brown, 2009). There is now some evidence that this tide is starting to turn. It would be good to see the notion of hierarchical skills levels replaced as the main measure of skills development by a more nuanced and useful conception of higher level skills, knowledge and understanding.

This Commentary is about higher skills development at work in both senses. It considers the importance of context – the need to understand how people develop and apply higher level skills, knowledge and understanding in different work contexts. It also focuses on the processes by which higher level skills, knowledge and understanding themselves 'work' and are developed in a range of education, training and other contexts, including employment.

Higher skills development is a complex topic and we offer some fresh thinking, based on:

- key processes and models to deepen and broaden our understanding of higher skills development at work.
- evidence from Teaching and Learning Research Programme (TLRP) projects and thematic activities about higher skills development at work.
- the adaptation of TLRP's ten evidence-informed principles on teaching and learning to the development of higher level skills, knowledge and understanding at work. The ten principles were developed in a schools context (see Improving teaching and learning in schools Commentary http://www.tlrp.org/pub/documents/TLRP_Schools_Commentary_FINAL.pdf) and have also been applied to higher education (see our Effective learning and teaching in UK higher education Commentary http://www.tlrp.org/pub/documents/UKHEfinal.pdf).

Key processes in higher skills development at work

- Engagement with challenging work
- Interactions at work
- Knowledge at work
- Self-directed learning at work
- Identities at work
- Supporting the learning of others

Our focus is on supporting the development of higher levels of skills, knowledge and understanding at work, and our findings are based on the analysis of our research evidence. Rebuilding the UK's intermediate-level skills base is also a pressing concern. It is the subject of a complementary TLRP Commentary on 'Towards expansive apprenticeships' (http://www.tlrp.org/pub/documents/apprenticeshipCommentaryFINAL.pdf).

Higher Education also has a key role to play in initial higher skills formation, and is the subject of the TLRP Commentary mentioned above.

The development of higher levels of skills, knowledge and understanding at work is a relational concept. We define it as learning and applying any combination of skills, knowledge and understanding which builds on what could be reasonably expected from a newly qualified skilled worker.

A newly qualified skilled worker demonstrates competence in the workplace, involving the application of knowledge and skills in a broad range of varied work activities, most of which are complex and non-routine. There is considerable responsibility and autonomy, and control or guidance of others is often present. Such a worker is most likely to be qualified at Level 3 in the National Qualifications Framework for England, Wales and Northern Ireland (which itself will be replaced by the Qualifications and Credit Framework); Level 6 in the Scottish Credit and Qualifications Framework; and Level 3 in the European Qualifications Framework.

(See http://www2.warwick.ac.uk/fac/soc/ier/glacier/qual/ for more on qualification levels and comparability of qualifications).

The relational definition recognises that there are different expectations of an experienced worker, at any level in an organisation, from those of a person who has just joined the organisation after initial training or from further or higher education. In the same way, an individual's work may undergo significant change, or he or she may undertake a new challenging role which involves upskilling or reskilling. In all three cases there will be a need for higher skills development at work. What can we learn of how these processes unfold?

The UK's search for increasing international competitiveness is the subject of a further TLRP Commentary on 'Education, globalisation and the knowledge economy' (http://www.tlrp.org/pub/documents/globalisationcomm. pdf). Both globalisation and moves towards a more knowledge-based economy raise the pressing question of the most effective approaches to higher skills development for people engaged in:

- the early stages of their careers
- upskilling, and
- reskilling of the existing workforce

Our evidence in answer to this question comes from the TLRP and also draws on related research at the Institute for Employment Research at the University of Warwick (see: http://www2.warwick.ac.uk/fac/soc/ier/glacier/). One interesting finding is that the development of higher skills at work is often not the prime focus of the activity undertaken, which might be to solve a problem or to improve performance in some way.

Engagement with challenging work

Where work is more challenging than you might initially expect....

Challenging work can be a major form of skills development at any stage of a working life:

A key role: not just driving the van.......

A van driver has to deliver sandwiches to a range of locations (shops, petrol stations, canteens). As the face of the company to the customer, the individual is expected to engage customers in how they might sell new lines or more products in the light of what they have seen in other locations. They have to 'sell' the products of the company to add value to what the customer may receive from official company marketing. Van drivers who establish a rapport with their customers and develop effective influencing skills make an enormous difference to the sales of the company – the skills, knowledge and understanding developed in this context are much more than just driving the van to get the product delivered on time – though that is important too. [TLRP Learning as Work project: http://www.tlrp.org/proj/phase111/felstead.htm.]

Challenging work: open question

This example shows that work performance involving a complex combination of tasks and duties may require the development of higher levels of skills, knowledge and understanding at work. Any work role which involves complex decision-making, problem-solving, advanced communication skills, supervisory or managerial responsibilities and the application of skills, knowledge and understanding in different contexts requires the development of higher levels of skills, knowledge and understanding. Activities such as the exercise of judgement, creativity, developing situational awareness and understanding, improving personal or team performance, supporting the learning of others, or changing the ways work is done also require the development of higher levels of skills, knowledge and understanding at work.

Work is less challenging than you might expect

The Learning as Work project Research Briefing (RB 55) highlights how learning at work is related to the productive system of the company, the organisation of work, and the type and range of activities at work. Generic analyses of the skills, knowledge and understanding required in occupations or work roles tend to build in some notion of the degree of challenge 'typically' required. TLRP research has shown that workers at any level of an organisation can be engaged in activities that are more or less challenging. Two workers with same the qualifications, job titles and rates of pay in the same workplace may experience work with different degrees of challenge and have different opportunities to develop higher levels of skills, knowledge and understanding at work.

A riveting example…….

Observation of the work of skilled aircraft fitters building wings at an aircraft manufacturer demonstrates major differences in the degree of challenge in different tasks. Some workers changed tasks regularly, while others preferred doing essentially the same task day after day and year after year. Workers who remained at the riveting station performed tasks with little variation apart from whether they were riveting curved or flat surfaces. They did individual work that, apart from its speed of performance, was no more than could be expected of a newly qualified skilled worker. Even on speed of performance a newly qualified worker would be expected to meet the 'experienced worker' standard within a month and, apart from some occasional rectification work, it quickly becomes completely routine.

However, skilled workers in another part of the factory, with the same formal training and qualifications, were engaged in equipping the wings of an aircraft. A pair of empty wings would arrive at the factory and teams of 15 workers would take 15 days (for the largest aircraft) to fully equip the wings and complete full supporting documentation. To call this work challenging is an under-statement.

Although each group of workers has the same formal qualifications, work for the same company and are paid as skilled workers, neither the company nor the individuals would consider switching workers between the tasks. The wing assembler, unlike the riveter, had engaged in activities requiring the development of higher levels of skills, knowledge and understanding at work and the skill sets of the two workers were radically different within a few years even though they were formally qualified at the same level [Alan Brown: field visit 2007].

Fuller and Unwin (2008) highlight how work activities and work environments can be characterised as more or less restrictive or expansive (http://www.tlrp.org/pub/documents/apprenticeshipCommentaryFINAL.pdf).

What lessons should we draw from this?

The degree of work challenge within the same occupation (whether for van drivers or for aircraft fitters) can vary greatly, as can individual skills profiles. The lesson is simple: we need a more complex model for individual development; organisational performance or national productivity than one based on hierarchical and undifferentiated skill levels. When considering policy and practice about learning and development at work the model needs to take account of how workers engage with work activities and the degree of challenge that work offers.

Interactions at work

Working and learning are social activities. Work relationships, interactions and learning influence opportunities for the development of work-relevant skills, knowledge and understanding. But actual workplaces can be more or less challenging for individuals. Workers may engage in highly routine activities with little challenge, and yet take on additional responsibilities, for example as health and safety representatives, shop stewards or union learning representatives. These duties require the development and use of higher level skills, knowledge and understanding. At the other extreme, the TLRP's Early Career Learning Project (RB 25) highlighted how some highly qualified graduates were employed as professional engineers but, given the dearth of challenging projects, were given routine work. The lack of the promised professional interactions in turn compromised their opportunities for professional development.

Multi-disciplinary team working: learning through co-operation and interaction

The operation of performance improvement teams provides an example of challenging activities which develop interactional skills. Such teams can include operators, maintenance staff, engineers, supervisors, senior managers, 'change agents', other specialist staff and even managers from other companies in the supply chain. These teams may be engaged in changing the way work is performed as well as the organisational culture. The teams typically have a series of intensive periods of formal training, but also learn from participating in performance exercises with support in their own organisation and from other organisations in the supply chain. They gradually take on increasingly complex performance improvement activities without external support within their own organisation.

This learning is often transformative for those involved. The operators found that engagement in these higher learning activities changed how they viewed themselves as employees and learners. Some operators subsequently took on supervisory responsibilities, while others enrolled in formal learning and development programmes. This type of learning and working also revealed the need for more highly qualified employees to reassess their own learning needs. One materials scientist with a PhD reflected that he needed to develop his communication skills. He was struck by how an operator in the team was more effective than he was at getting her points across (Brown et al., 2004).

The challenge of Inter-agency working: learning new inter-professional practices

The Learning in and for Interagency Working projects (RB 34; 48) give examples of people learning by developing new ways of working. They involved practitioners such as social workers, psychologists, health workers, teachers, and police, who collaborated to prevent the social exclusion of vulnerable children. The researchers worked alongside these practitioners as they were developing new inter-professional practices. They identified what practitioners needed to know to work across professional boundaries for children's wellbeing, and how their organisations were adapting. They found that the operational practices of employees were ahead of the overall strategy which nominally shaped their work conditions. Practitioners bent rules to collaborate in responsive work with vulnerable children. This rule-bending showed that organisations were not keeping pace with the demands of inter-professional practices. Effective inter-professional work with vulnerable children is vital and requires practitioners to work in local systems of distributed professional expertise to support children and families. Practitioners need to follow children's trajectories in fluid and responsive ways outside established organisational systems. These responsive practices need to go beyond established institutional systems, where professional and organisational boundaries are strong. Practitioners must be receptive to others' expertise in interpreting children's trajectories.

Developing new patterns of professional interaction is seen as vital but organisations are still unsure how to do this in practice

Lord Laming's March 2009 interim report on child protection stated that inter-professional work remains a 'work in progress' with limited organisational support and that the 'challenges of working across organisational boundaries continue to pose barriers in practice, and that cooperative efforts are often the first to suffer when services and individuals are under pressure.' (Laming 2009: 37). See: http://publications.everychildmatters.gov.uk/eOrderingDownload/HC-330.pdf

An approach based only on individual development is inadequate for the development of true interagency working. Instead it involves rethinking organisational conditions. Professional training currently does not prepare practitioners for working outside established organisational practices. The project team focused on how local authorities and Children's Trusts could be assisted to create the systemic transformations necessary for these new ways of working (RB 48).

What lessons should we draw from this?

Interactions at work can be a source of higher skills development through learning while working. They can also signal when individuals or organisations need additional learning. What is required for a professional to become more aware of the perspectives of other professionals and to forge new interactive ways of working will vary according to the individual, organisation and context. Skills development must address deep-seated issues of awareness and understanding. It involves work on professional identity which takes account of an individual's personal, occupational and their organisational identity.

Knowledge at work

Developing higher levels of skills, knowledge and understanding at work means engaging with a substantive knowledge base:

- prior to starting work,
- while working,
- through career development activities away from work, or
- through a combination of all three.

Higher Education often contributes in each of these settings. The 'Enhancing teaching-learning environments' project (RB 31) found that high quality learning, based on what we term deep learning or organised effort, was linked to the development of ways of thinking and to conceptual understanding. This involved access to the inner logic of the subject and its ways of thinking and practising. The 'What is learned at university' project (RB 32) highlighted how university study enabled students to engage with valued forms of knowledge.

It might seem that this focus on disciplinary knowledge and ways of thinking is out of tune with current forms of knowledge production, which is faster than older forms of learning. In fact many employers regard the grasp of a knowledge base, rooted in disciplined ways of thinking and practising, as a transferable skill, as the following example makes clear…….

Banking on graduates

A Human Resources Manager in charge of global graduate recruitment for European operations at an investment bank made it clear that they looked for both technical specialists and good generalists. In 2008 they recruited 220 graduates (with 51 different first languages), and over 180 in 2009. The specialists tended to be 'deep engaged learners' with well-developed technical skills and grasp of a substantive technical knowledge base (finance, economics, engineering or mathematics), while the generalists had good communication skills, some mathematical aptitude, could work effectively in a team and had demonstrated that they were capable of 'organised effort.' One of the established career pathways into posts in the main London office was through the French Grandes Écoles. [Alan Brown: field visit 2009]

It may not seem appropriate today to use investment banks as examples of sound judgement, but many aspects of the way they work are analogous to learning a discipline. Banking involves the development of conceptual understanding, with ways of thinking and practising that have their own inner logic. Looking for technical specialists and good generalists with a substantive knowledge base is a common approach in the recruitment strategies of many large organisations in the 'global war for talent' analysed in the TLRP Commentary on globalisation.

Knowledge gained during higher education is directly relevant to many jobs, but Eraut (2009) argues that the transfer of knowledge between contexts is not a straightforward process.

Transfer of knowledge between contexts depends upon:

- extracting potentially relevant knowledge from the context of its acquisition
- understanding the new situation
- recognising relevant areas of knowledge for the new situation
- focusing on necessary knowledge for a decision or action
- interpreting and/or transforming that knowledge to suit the new context
- integrating the relevant aspects of knowledge

But there are problems with knowledge transfer between contexts:

- it is often viewed as the responsibility of the learner
- new learning is often underestimated
- ideas about the transfer of knowledge, skills and understanding between education and practice settings are underdeveloped
- forward-reaching transfer is given more attention than backward-reaching transfer which occurs when workplace practice draws on prior learning
- over-generalisation can displace a focus on particular contexts (Eraut 2009).

Transfer poses significant challenges to transfer between individuals, within teams and within organisations. It raises tacit issues as well as issues of power and control and whether understandings are genuinely shared. Highly skilled workers often find that the most important workplace tasks and problems require the integrated use of several different kinds of knowledge (RB 25).

What lessons should we draw from this?

Developing knowledge at work is fundamental to higher skills development at work. The links between knowledge developed in different contexts such as higher education and work are complex and contextualised (RB 60). Issues raised by the development of knowledge while working contribute to the construction of a model of higher skills development at work.

Self-directed learning at work

Higher skills development at work depends partly on whether work offers an expansive learning environment (RB 55). However, it is also dependent upon individual actions. People vary in their self-awareness about their goals, aspirations, motivation, personality, inter-personal skills and resilience. They also differ in their appreciation of learning opportunities, contextual understanding and their ability to develop relationships and networks to support their learning and development. Capabilities for critical analysis, critical reflection, visualisation and organisation, and the ability to switch between context and generalisation, all help individuals to make the most of their learning opportunities (RB 25).

The TLRP's HE projects differentiated between several approaches to learning in higher education which could influence the subsequent development of higher levels of skill, knowledge and understanding. Students who applied organised effort to their studies, and who have the time management skills to concentrate and focus their attention, inherently had a skill set which is valued in many work contexts (RB 31). However, other work contexts do not make heavy cognitive demands, and require the development of other forms of skills, knowledge and understanding which can build on the personal development and social networking achieved by students in higher education (RB 32 and the two TLRP HE commentaries say more on this topic).

At work, being self-directed in terms of taking advantage of learning opportunities is helpful for individual development (Bimrose and Brown, 2009). It can involve willingness to engage in a wide range of activities such as asking questions; getting information; locating key resource people; listening and observing; learning from mistakes; giving and receiving feedback; trying things out; independent study; and working for a qualification (RB 25).

Identities at work: anchors and chains

Higher skills development at work is linked to early career learning, up-skilling or re-skilling, and transitions in work-related learning, careers and identities (RB 25; 47; 51; 55; 56). For example, fragmented employment experiences for beginning teachers reduce the quality of their Early Professional Development (RB 56) and insufficiently challenging work delayed the process of engineers regarding themselves, and being seen by others, as professional engineers (RB 25). In most circumstances strong attachment to work brings considerable benefits, including a sense of career stability and having a career 'anchor.' But it might also hold an individual 'in chains' and prevent them from attempting a career transition which becomes more difficult to achieve. Those individuals who see that their skills can be transferred to other contexts had significant advantages in changing career direction over those who defined themselves almost exclusively by their occupational and organisational attachments (Bimrose et al., 2008). People can learn from their lives through the stories they tell about them. This is important for their identity and agency (RB 51) and their willingness to engage in higher skills development.

Supporting the learning of others

Learning by interaction and from colleagues is important for higher skills development at work. Its effectiveness depends upon how well colleagues are able to support the learning of others. In knowledge-intensive work and settings involving complex teamwork, many organisations explicitly use a developmental view of expertise that goes well beyond expecting technical proficiency and a commitment to continuing improvement. In these settings organisations pay particular attention to ensuring that teams possess people who able to support the learning of others (Brown, 2009).

Giving feedback on aspects of individual performance over time can be useful (RB 25), including:

- Immediate comment on aspects of a task given on the spot

- Informal conversations away from the job

- Formal roles such as mentor or supervisor involving responsibility for a learner's short to medium term progress and regular formative feedback

- Review designed to give employees feedback on personal strengths and weaknesses and ascertaining views on learning opportunities and expectations.

Feedback and support may have an affective dimension. Early professional learning of teachers (especially in the first year of teaching) is mainly about emotional and relational development rather than cognitive learning (RB 56). This means that those interacting with new teachers need to learn how to support this phase of their professional development.

Models of higher skills development in context

We need a model that places higher skills development in the organisational context, but which also allows for individual differences in action, engagement, motivation and identity. The Early Career Learning project (RB 25) engaged directly with this challenge and Eraut (2009), also drawing on work on mid-career development, provided a series of models to understand higher skills development at work.

The current capability of a person or a group cannot be assessed from a simple reading of what an individual has achieved in education, training or employment. The question is how prior experience links to an individual's career development. Here strategies may involve a mix of developmental activities. For those needing higher skills development at work, such as technical, managerial and professional staff, the aspects of activities identified as requiring further development could include:

- Task Performance
- Role Performance
- Situational Awareness and Understanding
- Teamwork
- Personal and Group Development
- Decision-Making and Problem-Solving
- Academic Knowledge and Skills
- Judgement.

Each aspect can be further divided into a number of components, as shown in Figure 1. The development of an individual's capabilities in relation to each component can be represented as a learning trajectory, where performance is developed over time and in a range of education, training or work settings. The learning trajectory may also focus on a broader grouping of activities.

Evidence of capability to support a learning trajectory has to be holistic rather than being related to the isolated completion of components. It must relate to performance in a range of contexts and must allow for variation in the people involved in this performance, including clients and colleagues, and the conditions under which the performances took place

Learning Trajectories represent changes in capabilities over time including:
- New additions to the components in Figure 1
- Evidence of continuing use of previously developed capabilities
- Significant new additions to the contexts, people or conditions
- Actions to compensate for losses of capability resulting from a lack of practice or not keeping up with changing standards (Eraut, 2009).

Figure 1: Aspects of performance which may need to be developed through particular learning trajectories (developed from Eraut 2009)

Task Performance

Speed and fluency

Complexity of tasks and problems

Range of skills required

Communication with a wide range of people

Collaborative work

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

Awareness and Understanding

Other people: colleagues, customers, managers, etc.

Able to understand the perspectives of others

Contexts and situations

One's own organization

Problems and risks

Priorities and strategic issues

Value issues

Teamwork

Collaborative work

Facilitating social relations

Joint planning and problem solving

Ability to engage in and promote mutual learning

Ability to support the learning of others

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

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

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

Judgement

Quality of performance, output and outcomes

Priorities

Value issues

Levels of risk

Eraut (2009) outlines other models to examine higher skills development at work by drawing relationships between factors affecting learning in the workplace and the contexts which influence how learning takes place (figure 2).

Figure 2: Factors affecting learning in the workplace
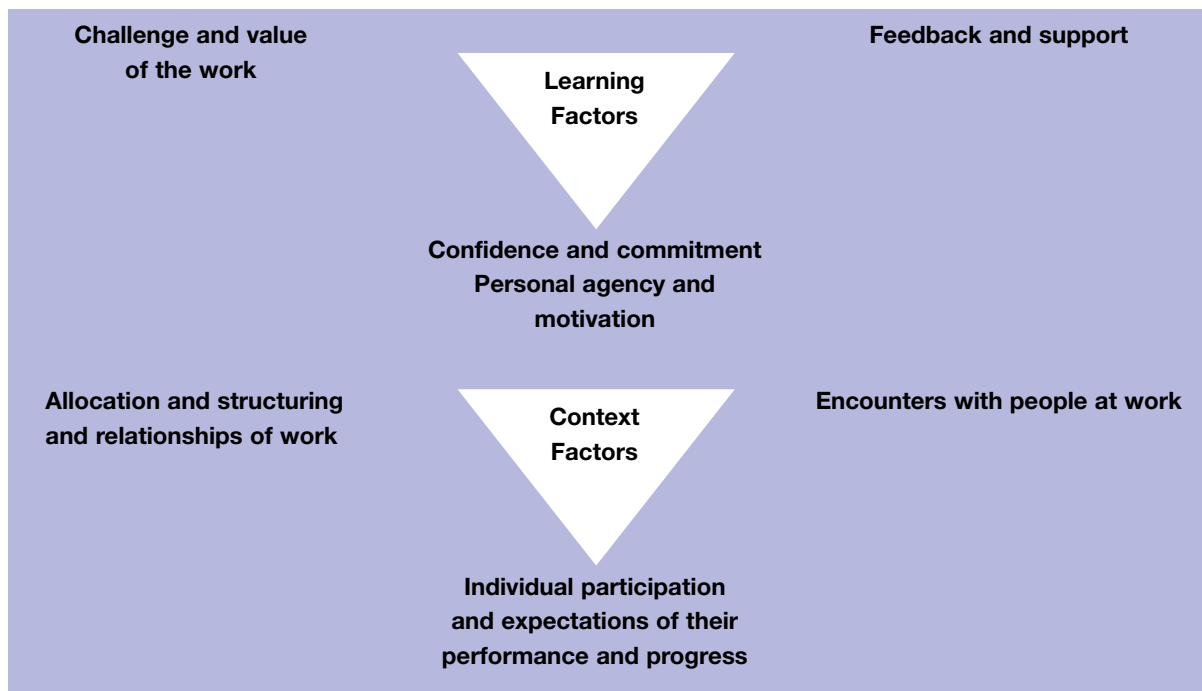
The workplace development of higher levels of skills, knowledge and understanding is dependent on monitoring gaps between job requirements and individual capabilities as mapped in Figure 1. Individuals can build their expertise in various ways, but developing expertise also depends on the contributions of others, including through:

- Use of knowledge previously created by others
- Use of tools and knowledge embedded in the work environment
- Being a member of a team that relies on complementary contributions from members and complementary representations of complex environments
- Co-workers with shared mental models of the problem in hand
- Networked expertise
- Contributing to a group's capability or an organisation's repertoire
- Developing competence or learning expertise through working with others.

Individuals or groups need to consider what should be learned from - Figure 1 - and how this learning relates to the conditions in which they will be expected to perform. They will need to decide whether the goal is that expertise in that domain is to be maintained, widened or enhanced (Eraut, 2009). The most effective development strategies in particular settings are partly dependent upon the quality of the workplace as a learning environment (RB 55), but also on whether individuals reflect upon, monitor, consult about, evaluate and try to improve their own practice.
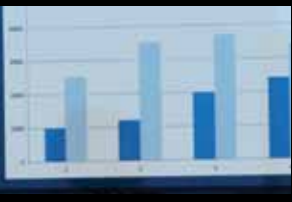
TLRP's evidence-informed principles for higher skills development at work

We now present TLRP's evidence-informed principles, generated from research on schools and further and higher education, and adapted to fit the context of higher skills development at work. These principles were the product of an iterative process of consultation and debate between researchers, practitioners, policy makers and the TLRP Directors' Team. The findings from relevant projects are linked to the evidence-informed principles in order to develop ideas for effective approaches to supporting higher skills development at work.

1. Skills development policy should have twin foci upon enhancing both individual development and organisational performance.

Higher skills development policy should recognise two key realities. First, engagement with challenging work is the most effective form of higher skills development in employment. Second, in the UK as elsewhere in Europe, the most effective way individuals in unchallenging work upgrade their skills is through job change. Skills development policy should not elide the two. They cannot be reconciled in a sector-based, employer-driven skills policy.

Public policy should support the development of activities required for an individual to perform more effectively. If an individual wishes to enrol on a publicly-funded programme for reasons of career development and progression, the decision about whether this represents substantive up-skilling is an individual decision, taken in light of their current circumstances. Progression and programmes of study taken can only meaningfully be judged from an individual perspective

Skills development policy for employers should have a similarly singular focus on improving organisational performance. This may mean making use of low-skilled labour. Exhorting these employers to invest more in education and training may have a limited role, but being in an undemanding job with few prospects is not necessarily a problem for employees at particular stages of their life-course. It is staying in an undemanding job with few prospects that is problematic for both the individual, and from the perspective of public policy, because such individuals become very vulnerable in the labour market over time. An effective public policy solution is simple: give people access to independent advice and guidance and encourage them to look for more challenging work. Remember that the switch to more challenging work is the most effective form of up-skilling for individuals with few qualifications. Even if this approach is not immediately successful it might act on the willingness to engage in other forms of up-skilling or re-skilling.

Current policy priorities with a narrow focus on knowledge and skills for work as part of an employability agenda may not be in tune with the priorities of many students (RB 32; 42), nor do they relate well to the recruitment strategies of many employers or the changing global context in relation to skill development (RB 53). The focus remains on the attainment of qualifications (RB 28; 52), rather than upon progression or a developmental approach to building competence and expertise (Brown, 2009).

A developmental view of competence reflects attitudes towards learning and development that go well beyond technical or behavioural competence. That such orientations are not amenable to reductionist, analytical approaches to competence development is clear from the work of Sandberg (2001) who shows that there are very different ways in which highly skilled professionals can approach their work. Competence needs to focus upon higher levels of aggregation than effective task completion. The increasing need for employees with proactive approaches to learning and knowledge transformation makes this requirement ever more pressing (Brown, 2009)

2. Effective higher skills development depends on the learning and development of all those who support the learning of others in the workplace.

Supporting the learning of others is a key competence in organisations concerned with organisational learning and team development (RB 32; 34; 47; 48; 54; 55; 61). As we have seen, the professional learning of teachers in their first year of teaching is characterised by emotional and relational development, with little explicit cognitive learning. Those interacting with the new teacher also need to learn and develop if that interaction is to be effective (RB 56). In some knowledge-intensive industries there is explicit recognition that some people are more effective at supporting the learning of others. Making sure that groups include such people is regarded as important in facilitating group performance (Brown, 2009). Many musical students teach others while in higher education, and report that this enhances their own performance and career preparation. In some musical genres there is a deeply-embedded culture of supporting the learning of peers, through making music together, demonstration, critique etc. (RB 47; 61).

Vicarious learning for health care professionals

The Vicarious Learning project (RB 54) considered the effectiveness of learning through observing the teaching of others for developing health science students' clinical reasoning skills. In Vicarious Learning, students are reassured by seeing other students experiencing the same difficulties as themselves, and by being exposed to other students' discussions of difficult topics. They also gain from observing experienced clinician educators who model professional language use, a process termed empathic identification. In technology-enhanced learning contexts, Vicarious Learning can be personalised to allow students to decide when to retrieve a dialogue or to allow the system to detect impasses and relevant clips to view, a process called mixed initiative learning. Students benefit from Vicarious Learning in their clinical training in skill acquisition, from exposure to good models of professional language use, and in academic self-esteem and self-confidence.

The use of Vicarious Learning recognises the scale of the challenge in learning to make clinical reasoning judgements and the value of peer support. Expertise consists of subject specific knowledge as well as more general problem-solving skills. Applying both is a cognitive challenge and individuals need considerable support in learning to make such judgements. Support from peers is helpful, not least because they are able to share concerns about their lack of confidence and how common it is to have difficulties in this area.

Support from observing others sharing these problems was also effective. The virtual network could take on some of the positive functions typically played by personal networks in providing support and reassurance when someone is engaged in developing higher skills, knowledge and understanding. Observing discussions between students and tutors (again virtually) helped students develop more professional ways of talking about clinical concepts in context. The effect is that important 'identity work' occurs alongside other forms of learning. Technologically-enhanced vicarious learning could be useful across a range of different learning outcomes – cognitive, strategic, affective, or social-emotional (RB 54).

3. Informal learning is central to higher skills development at work.

Much is learned during interactions in the performance of challenging work without any explicit acknowledgment of its learning dimension. Learning is regarded as essential to work, but just as much informal learning occurs on formal education and training programmes, so much formal learning occurs in work contexts. An example is when a colleague is asked how to do something and they demonstrate and then support you while you try to follow their approach.

Conservatoire students expect and hope for a broad career in music. Many students also teach part-time while in higher education, and as we have seen, report that this activity enhances their own performance and career preparation (RB 47). Especially in genres other than classical music, musicians may also engage in networking activities, peer learning and review when performing informally (RB 61). Many students are already also performers and recognise that they will probably develop a portfolio career where learning, teaching and performing music may be intertwined. Informal transitions between different roles, which may include other types of work too, are necessary to sustain a complex portfolio career. People can learn from their lives through the stories they tell about them. This is important for their identity and agency (RB 51).

4. Higher skills development at work involves both individual and social processes and outcomes.

Skills development has a clear social dimension, for example when individuals learn through interaction with colleagues, clients or customers or participate in work-related networks or communities, and when participating in activities such as coaching or mentoring. There is a role for personal agency. Learning will depend on how well an individual is able to marshal resources for learning, how much effort is put into learning and the frequency and type of reflection upon experience which occurs.

HE students often seem to assign more importance to the personal and social dimensions of change than to the academic, but personal networks can be very important as a source of reassurance when undertaking challenging work and an employee is nervous about disclosing this to colleagues (RB 32). Students engaged in professional learning and who are collaborating with other students frequently communicate their lack of confidence and indicate when they are stuck or lack knowledge. Students reassure each other that they are not alone in their difficulties (RB 54).

Responsive practices of practitioners engaged in inter-agency working go beyond engaging with established institutional systems where professional and organisational boundaries are strong (RB 48). Learning is complex and multi-faceted, and can only be understood relationally (RB 51). Effective collaboration is related to the autonomy available to key partners and the role of external bodies. Rules set outside this context may constrain collaboration. Commitment to collaborative working is enhanced and deepened when it is seen to lead to tangible outcomes (RB 34). Learning is shaped by complex cultural relationships and improving learning depends upon recognising this complexity (RB 12). Students' complex social lives are brought into the classroom and being a student is fitted into a wider life. This affects participation and engagement in learning (RB 52).

Emotional labour

Teachers with relevant high-level vocational expertise can find that one of the most challenging aspects of teaching in further education involves

- handling emotions;
- building and sustaining relationships; and
- the disposition to attend to other perspectives.

Teachers in FE invested heavily in emotional labour as a coping strategy to deal with the pressure and stresses they faced from increasingly challenging and reluctant learners. In their dealings with these students and to diffuse difficult classroom situations, teachers displayed tolerance, feigned amusement and acted in ways which belied their real feelings. The emotional struggles and range of emotions they experienced provided evidence of the complex relationship of teaching and caring. It involved a range of emotions from irritation and frustration with students who did not engage through to joy at how individuals responded to encouragement and demonstrated progress. The majority of teachers in FE worked with students well beyond the allotted course timetabled hours. Extensive use of one-on-one teaching within timetabled classes and beyond them occurred in all sites. Teachers established nurturing relationships, chased up missing students via texts and phone calls and generally felt that the emotional labour they undertook, although draining, was part of being an FE professional (RB 52).

5. Higher skills development at work promotes the active engagement of the individual as a learner.

One goal of higher skills development should be to support individuals becoming more self-directed learners. This involves engaging employees actively in their own learning, and ensuring that they acquire a repertoire of learning strategies and practices, develop positive learning dispositions, and become agents in their own learning.

Several examples arise from TLRP projects. We showed that students should be supported from early on in their course to develop a broad identity as a musician and to redefine and widen their career expectations (RB 47). Current professional training does not prepare practitioners for working outside established organisational practices (RB 48). 'Industry educators' serve two roles as knowledge brokers: supporting the design of new programmes and facilitating learner engagement with the programme (RB 60).

Active engagement and mediating artefacts:

Mediating Artefacts (texts or objects) can play an important role in generating learner engagement (RB 27), particularly in relation to transferring knowledge between people. Sometimes knowledge resides in them, but in other cases the important knowledge transfer occurs in the conversations that take place around them. Examples of artefacts with a key learning function include models of the manufacturing process; software tools explaining statistical process control (RB 27); current audit files under construction and the audit of the previous year in accountancy; together with the 'tests' (or protocols) devised by more senior managers in the office, selected for that particular client and provided in electronic form to the audit team; nursing shift handover documents (RB 25); individual care plans for children at risk (RB 34; 48). Mediating Artefacts can support effective communication; knowledge sharing; developing collaborative understandings; help overcome barriers to understanding; and support the learning of others (RB 25; 27; 34; 48).

6. Effective higher skills development at work is dependent upon the timeliness and quality of feedback and support.

The assessment of learning and/or performance at work may be summative, for example to obtain a licence to carry out certain operations, or as part of a formal review of the achievement of qualifications. It may be formative, comprising feedback designed to support the learner informally. It may be helpful to give feedback at different times, depending on context and the nature of the activity.

Comments given while a task is in progress, or of an approaching problem can reinforce learning, particularly if it leads to an immediate improvement in performance. If immediate comment is not appropriate, an informal review later may be helpful. Judgement is also required on the sensitive topic of giving feedback. The message heard may not be what was intended. Where someone has responsibility to support the learning of others as part of a formal role, such as a mentor, supervisor or team leader, it is important that medium-term feedback be given on the learner's overall performance (RB 25).

There is recent growing interest in how more formative workplace assessment can align individual development with organisational development. This includes examining how processes of formative assessment and critical reflection in the workplace can support employees' commitment to lifelong learning and knowledge transformation processes at work (Brown, 2009).

7. Effective higher skills development at work requires learning to be systematically developed.

Additional activities could be designed to develop learning trajectories to improve performance, through a focus upon:

- Task and Role Performance;
- Situational Awareness and Understanding;
- Teamwork;
- Personal and/or Group Development;
- Decision Making and Problem Solving;
- Academic Knowledge and Skills; Judgement (RB 25).

Some of these may require active monitoring and occasional intervention, whilst others need a programme of systematic development, for example, to learn a new technique, undertake a major new role or in response to a major work change.

Students seeking musical expertise should be encouraged to pursue activities alongside and within their specialism that will help them create their own expansive learning environment (RB 47). Work on learning clinical subjects showed that the majority of students felt that observational learning is an efficient way for them to learn. It allowed them to learn more professional ways of talking about clinical concepts, and gave them more time to reflect than traditional teaching (RB 54). Re-contextualisation of knowledge takes place in programme design; in teaching and learning; in the workplace; and in learners as they make sense of the whole. The structure of Foundation Degrees enables the dual accreditation of professional qualifications in ways that are valued by learners (RB 60).

Organised effort by HE students is important and applies to situations where students marshal their resources, manage their time and apply concentration to achieve their learning goals and high grades on their courses. Being able to apply organised effort to multiple tasks is a valuable skill for a wide range of settings, especially for higher skills development at work. It is also linked to being able to tackle a high volume of content as well as to meeting the depth of the learning challenge (RB 31).

8. Effective development at work recognises the importance of prior experience and learning.

A key factor in developing higher skills at work is assessing current capability based upon prior achievements and learning. This does not involve a simple reading of an individual's achievements in education, training or employment and the assumption of unproblematic transfer of learning. This should be informed by prior experience and how these activities link to an individual's career development goals (RBs 25; 59). Music curricula need to be more sensitive to the ways in which gender and genre impact on musical learning. They should be differentiated to address biases that can have negative influences on musicians' learning trajectories (RB 61). Students' learner identities are influenced by their experience of school, their current university experience, their social circumstances and their aspirations (RB 44). Some students have had negative prior experiences as learners, especially in school, often leading to negative learner identities. Not all are equipped with the knowledge and skills for learning (RB 52).

9. Effective higher skills development at work engages with expertise and valued forms of knowledge.

Higher skills development requires engagement with ways of thinking and practising, conceptual understanding, and the attitudes and relationships associated with particular areas of expertise (RB 31). Learning to perform requires a complex balance between breadth and depth of learning. Musical expertise is not achieved solely through a narrowing of focus (RB 47). Multi-faceted partnerships with industry can embed knowledge flows within and between programme design, teaching and learning, the facilitation of learning, workplace practices and the learner. It is also desirable to move beyond a focus on transfer and typologies of knowledge to strategies for putting different types of knowledge to work. These are contextualised and re-contextualised as individuals move between different sites (RB 60). Demand for knowledge workers rises exponentially in knowledge economies (RB 53).

Higher education allows individuals to engage with valued forms of knowledge. This knowledge provides:

- an opportunity for engagement with disciplinary or systematic knowledge that may be an introduction to particular careers
- evidence of the ability to engage effectively with a complex knowledge base (a skill that is often undervalued by those arguing that if a knowledge base is changing rapidly only knowledge handling skills are required)
- value on the labour market (for example, where employers classify certain jobs as graduate entry).

10. Effective higher skills development at work should engage with individuals' broader life goals.

The development of higher skills is framed by patterns of individual actions, engagement, motivation and identity. Individuals should regard themselves as possessing skill sets that can be used in various contexts rather than being over-attached to occupational or organisational identities (Bimrose and Brown, 2009). This would help individuals flourish in a diverse and changing society.

The experiences of others within an individual's social networks critically shape the perceptions of adults who are 'potentially recruitable' to higher education. Identifying with entrants to HE who are 'people like me' in terms of education, social and employment background influences their decision-making between and within generations (RB 43). Education is seen as important for social justice and not just employability (RB 53). Learning is ubiquitous at all stages of life and varies in its significance and value (RB 51).

Student expectations of outcomes from university emphasise personal change, the development of social networks and learning to get on with a wide range of people (RB 32). Achievement of these outcomes is worthwhile in itself and can, if sustained, facilitate subsequent learning and skill development. Having personal networks, independent of workplace, can be valuable as a fresh perspective on progress at work. Early career teachers and nurses found it helpful to discuss work problems that they would be unwilling to discuss with someone from their workplace for fear of being judged incompetent (RB 25; 56). The employability and skills agenda set down by government may not be fully shared by students, while from an educational perspective, a narrow focus on employability and skills risks neglecting important ways in which higher education changes people's lives and the communities in which they live (RB 32). For developing skills at work, student emphases on personal change, social networks and learning to get on with a wide range of people, linked to 'organised effort' (RB 31) are in tune with many employers' recruitment strategies.

Major implications of Learning to Perform

Two complementary TLRP projects studied aspects of how musicians develop their expertise: Learning to Perform and Investigating Musical Performance. Together they provide rich evidence on the active engagement of learners. This evidence ecompasses the development of their skills, knowledge and understanding and their identity as a performer. Learning to perform requires a balance between breadth and depth of learning. Expertise is not achieved through a narrow focus. Those developing expertise should be encouraged to pursue a range of activities to help create expansive learning environments. There are dangers attached to over-identifying with a particular specialism. It was more helpful to develop a broad identity as a musician, albeit one with a specialism, to redefine and widen their expectations.

Learning to perform can be improved through an expansive approach, redefining and widening student expectations and ensuring flexibility in the learning process. Finding the balance between study, practice and work that contributes to a broad portfolio of skills is the key challenge for those seeking expertise in music. Students need to move between breadth and depth as they develop expertise, using each to complement the other, and should be encouraged to create their own expansive learning environment. Institutions of music should recognise the challenging transition from school to Conservatoire, constructively challenging students' identity and allowing them to build and widen their concept of what it is to be a successful musician. Conservatoire students typically seek a career in music, and institutions need to provide space for students to explore professional skills as one facet of their developing musical expertise. Students need resources appropriate to their stage of development to develop their expertise while preparing effectively for their chosen future career (RB 47; 61).

Future directions for higher skills development at work

Learning while working can be a rich developmental vein for highly skilled workers. It calls for a balance between formal and informal approaches. Informal learning while working is not sufficient for personal professional development in the long term. Most workers are aware that learning does not grow only 'by doing' (accumulating experience through performing work processes) or 'by using' (particular tools and techniques). There are advantages to a systematic approach to learning and development, using for example:

- the systematic exploitation of the web,
- participation in specialist networks,
- relationships with technologically advanced customers or colleagues,
- participation in innovation activities, or
- opportunities for formal education and training.

Learning from others with acknowledged expertise can be facilitated through activities such as work shadowing, or explicit knowledge sharing activities. It can be built into the organisation of work activities.

This approach provides a fresh perspective on higher skills development at work. It emphasises learning through working, interacting and self-directed learning. These processes can lead to improved contextual understanding interspersed with periods of formal learning and development that allow for considered reflection. This approach integrates experiential and informal learning with rounded professional and personal development.

Bearing in mind William Gibson's comment that 'the future is already here, it's just unevenly distributed' a developmental view of expertise in the workplace is likely to become more prevalent in future. The recent report of the Panel on Fair Access to the Professions, chaired by Alan Milburn, entitled Unleashing Aspiration (July 2009) provides an indication of this possibility. It examined the issue of social mobility and its importance for the economy and social justice, ensuring that everyone has the chance to fulfil their potential and secure the jobs of the future (http://www.cabinetoffice.gov.uk/strategy/work_areas/ accessprofessions.aspx). Under this approach, the current focus on personal competence, assessment and qualifications as proxies for work-related skill may be recognised more widely as unhelpful, and greater impetus may be given to promoting the more collaborative approaches to learning and development outlined in this Commentary.

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Effective learning and teaching in UK higher education
http://www.tlrp.org/pub/documents/UKHEfinal.pdf

Widening participation in higher education,
http://www.tlrp.org/pub/documents/HEcomm.pdf

Education 2.0? Designing the web for teaching and learning,
http://www.tlrp.org/tel/publications/files/2008/11/tel_comm_final.pdf

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http://www.tlrp.org/pub/documents/apprenticeshipCommentaryFINAL.pdf

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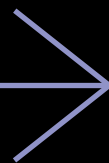
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Higher skills development at work

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