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**The relationship between work-related learning and higher education following the implementation of the Bologna Process and the European Qualifications Framework:**

**Is the focus upon levels, learning outcomes and qualifications making it more difficult for Europe to reach the Lisbon goals?**

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# **The relationship between work-related learning and higher education following the implementation of the Bologna Process and the European Qualifications Framework:**

## **Is the focus upon levels, learning outcomes and qualifications making it more difficult for Europe to reach the Lisbon goals?**

### **Abstract**

The Framework for Qualifications of the European Higher Education Area is part of the implementation of the Bologna process. There is, however, an even broader European Meta-Framework for Qualifications currently under development – the European Qualifications Framework (EQF). What is therefore of particular interest in the field of work-related learning is the articulation of qualifications frameworks for HE and other areas, principally vocational education and training, in order to facilitate progression as well as deliver the skills, competences, knowledge and understanding necessary to perform highly skilled work. This paper will look at the mixed effects of the preoccupation with levels, learning outcomes and qualifications associated with the EQF in this area. In particular, this paper also addresses the issue of whether these preoccupations are making it more difficult to achieve the broader Lisbon goal of moving towards a more knowledge-based society, even if the Lisbon target of 50% of the cohort going into HE is reached.

### **1. Context**

#### ***Framework for Qualifications of the European Higher Education Area***

The Framework for Qualifications of the European Higher Education Area, adopted by European Ministers for Higher Education in Bergen in May 2005, is part of the implementation of the Bologna process. There is, however, also a second European Meta-Framework for Qualifications currently under development – the European Qualifications Framework. What is therefore of particular interest in the field of work-related learning is the articulation of qualifications frameworks for HE and other areas, principally vocational education and training, in order to facilitate progression as well as deliver the skills, competences, knowledge and understanding necessary to perform highly skilled work.

The challenge for the Framework for Qualifications of the European Higher Education Area was to create a European qualifications structure that facilitates the connection between national frameworks of qualifications, so as to make clear the relationship between different HE qualifications within Europe. Such a framework was intended to help the Bologna Process establish transparency between different HE systems, thereby improving recognition of qualifications across national boundaries and lessening barriers to mobility of citizens. The overarching framework, however, had to be articulated with transparent national frameworks, which resulted from the Bologna reforms, and take due cognisance of the broad purposes of higher education: preparation for the labour market; preparation for life as active citizens; personal development; and the development and maintenance of a broad, advanced

knowledge base. Employer dissatisfaction with the role of HE in preparing graduates for the labour market was part of a discourse that was influential as one of the driving forces behind the Bologna Process, irrespective of the validity or otherwise of the claims being made. However, the relationship between education and work extends beyond HE and, as one mechanism for relating the two fields is qualifications, it is important to look at how qualifications gained elsewhere articulate with those achieved in HE settings. The same general challenge of how these other qualifications relate to each other and travel across boundaries applies with equal force to qualifications gained outside HE. It is for this reason that the European Qualifications Framework is currently being developed.

### ***Development of national qualifications frameworks***

Developing a qualifications framework has a technical dimension involving a systematic description of the full range of qualifications within a given education system, as well as the ways in which learners can navigate between them. However, qualifications frameworks also embody educational values and purposes of education, so any European framework has to be able to engage with the particular, as well as the general, educational purposes enshrined within national qualifications frameworks. One further point is that many countries in Europe have until very recently not had a national qualifications framework, and even in those countries that did have one the coverage of qualifications was often only partial. Ireland perhaps has gone furthest in this respect but even in their case the full national framework was only completed in 2005.

### ***Need to articulate HE and VET qualifications***

Alongside the Bologna process for HE, the Copenhagen process aims to develop instruments to enhance the transparency of vocational qualifications and competences, and to increase co-operation in vocational education and training. One advantage of trying to articulate the two sets of qualifications is that the process could support learners by clarifying the full range of educational opportunities available to them and by creating a variety of pathways that bridge between the different qualifications. The development of national frameworks of qualifications is an area of national responsibility, and so the European Qualifications Framework (EQF) will be a benchmark against which national frameworks can be measured, rather than an entity into which other national qualifications frameworks have to fit. National frameworks of qualifications will also continue to change to reflect changes in priorities as part of a national political process.

### ***Development of EQF***

The European Commission published a consultative document on this Framework in July 2005 and, in September 2006, the Commission adopted a proposal for a Recommendation of the European Parliament and of the Council on the establishment of the European Qualifications Framework for lifelong learning (EQF). The aim is that the European Qualifications Framework will relate to all education and training awards in Europe, including those aligned with the Framework for Qualifications of the European Higher Education Area. The EQF will provide a common language to describe qualifications which will help Member States, employers and individuals compare qualifications across the EU's diverse education and training systems.

Ján Figel', European Commissioner for Education, Training, Culture and Multilingualism, said: "People in Europe too often face obstacles when they try to move from one country to another to learn or work, or when they want to build upon previous education or training. The EQF will help to solve that problem: it will make different national qualifications more understandable across Europe, and so promote access to education and training. Once adopted, it will increase mobility for learning or working. We believe the EQF is a key initiative in creating more jobs and growth, helping people in Europe to face the challenges of a globalising, knowledge-based world economy" (European Commission, 2006).

The proposal is one of the concrete outcomes of the 'Education and Training 2010' work programme established after the Lisbon European Council in 2000. The core element of the European Qualifications Framework (EQF) is a set of **eight reference levels** describing what a learner knows, understands and is able to do — their '**learning outcomes**' — regardless of the system where a particular qualification was acquired. The EQF reference levels, with their focus on learning outcomes, are intended to:

- support a better match between the needs of the labour market (for knowledge, skills and competences) and education and training provisions;
- facilitate the validation of non-formal and informal learning;
- facilitate the transfer and use of qualifications across different countries and education and training systems.

The EQF covers general and adult education and vocational education and training, as well as higher education. The eight levels are intended to cover the entire span of qualifications from those achieved at the end of compulsory education to those awarded at the highest level of academic and professional or vocational education and training. The draft recommendation foresees that Member States will relate their national qualifications systems to the EQF (by 2009). This approach is intended to enable individuals and employers to use the EQF as a reference tool to compare the qualifications levels of different countries and different education and training systems, for example vocational training and higher education. The role of the EQF will be to function as a type of translation device to make relationships between qualifications and different systems clearer. The EQF is also intended to help European education and training systems become more transparent and accessible to the general public.

### ***Lisbon goals***

The Lisbon European Council in 2000 concluded that increased transparency of qualifications and lifelong learning should be two of the main components in the efforts to adapt Europe's education and training systems both to the demands of the knowledge society and to the need for an improved level and quality of employment. In the Recommendation 'the EQF is central to the fulfilment of the EU's objectives in the Lisbon Partnership for Growth and Jobs.' Now increased transparency is a worthwhile goal in its own right, but it is a common trap to think that a more highly qualified workforce equates to a more highly skilled and more knowledgeable workforce of the type required for a knowledge society. I will argue, however, that the focus on levels, qualifications and learning outcomes can be comforting because it gives the illusion of progress, but a much more sophisticated model of skill

development and expertise is required to underpin meaningful movement towards a knowledge society.

***Problems with the focus on qualifications, outcomes and levels***

Now transparency is a worthwhile goal, but in the context of the Lisbon goals there is a temptation to focus upon the targets (percentage of people receiving qualifications at a particular level) rather than the underlying goal of moving towards a more knowledge-based society. The focus upon outcomes and levels indeed may make the goal harder to achieve in that it may exacerbate the problem whereby people think that a qualification marks a significant end to the learning process, rather than simply being a marker for a change of focus of learning. Perhaps a classic example of this is nursing in England: when nurses become fully qualified they invariably struggle for the first few months (and some even think of leaving the profession) because of a lack of support in dealing with the significant learning challenges they face in their transition from student status and in their attempts to transfer what they have previously learned to their new work situation. In many ways, they have much more to learn in the six months after qualification than at any stage of their training, but many people are misdirected by the achievement of the qualification into thinking that they are fully proficient. Indeed this example can be extended in order to make wider point that criticisms that graduates are not fully work-ready fundamentally misunderstands that support for transfer of learning and the development of a new work-related identity is almost always required when people move between contexts.<sup>1</sup>

Furthermore, levels are treated as if they have some universal meaning and this assumption acts as a bar to genuine skill development: in reality all skill profiles in any area are likely to be spiky (as performance in some aspects are much stronger than in others), whereas attribution of a level represents an aggregation of performance. For example, many hospital consultants could benefit from development of what are quite often fairly basic communication skills, but getting consultants to sign up to such courses, rather than high level specialist courses, is problematic, principally because their image of themselves as learners and specialists means they consider they long ago progressed beyond that type of learning.

Attribution of qualifications to levels is also always a political process, as it depends upon valuing certain types of skills, knowledge and understanding over others, and upon decisions about how demanding to make initial qualifications. For example, the initial training of people to take X rays depends largely upon the breadth of training: 10 weeks for an assistant radiographer or three years for a radiographer trained to use a wider variety of equipment and given greater underpinning knowledge. An even more explicit example of the political process in action concerns the development of guidance: practitioners – those with a full range of counselling, training, development, coaching and mentoring skills may possess a qualification at level 4 or 5 in the English National Qualification Framework (NQF), yet an executive coach, with a

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<sup>1</sup> Before we feel too sorry for HE staff, we should remember that they too get irritated that their entrants from schools are not as well prepared as they were in a previous golden age. In an English context this is certainly before the 1450s, because it was then that God's House (forerunner of Christ's College), a college in Cambridge, was set up with a particular focus upon the development of basic skills, because undergraduates arriving in Cambridge were no longer so well equipped for study because of falling standards in English schools!

very much reduced set of skills for influencing and supporting others, can obtain a level 7 qualification. The argument is that the volume of learning is very much less in the latter case but the level is higher. In practice, however, it is hard not to believe the decisive factor is the status of the person you are coaching: a senior executive!

The arbitrariness of levels is though perhaps best illustrated by another Level 7 NQF qualification: the Diploma in Translation (from the Institute of Linguists). This is a professional qualification intended for those who, having reached a level of linguistic competence at least equivalent to a good Honours degree, wish to embark on a career in professional translation. The Diploma tests the ability of candidates to translate to a professional standard, together with their awareness of the professional task of the translator. This qualification also illustrates how transfer between academic and professional qualifications is not straight forward. An Honours degree would rarely be sufficient to enable a candidate to pass the requisite examinations and they would not normally need to complete a further programme of study and gain some professional experience. On the other hand, for someone with professional experience (based on linguistic competence as a native speaker) but without a degree completion of the Diploma would give, for example, only 60 credits at level 2 towards an undergraduate degree (equivalent to NQF level 5). This example gets to the crux of the matter – moving from a level 7 to a level 5 qualification, even in the same broad area, not only clearly represents progression at the individual level, but would also add value to the general stock of skills, knowledge and understanding of the workforce and make sense in terms of the Lisbon goals. However, in terms of the Lisbon targets it is not making the individual worker or the workforce as a whole more highly qualified: the proxy for more highly skilled (i.e. more highly qualified) is preferred in policy terms to more highly skilled in practice.

The answer to the question ‘Will Higher Education be ready for the European Labour Market after the Bologna Process?’ depends not only on what happens in HE but also in the labour market. One consequence of the Bologna process will be that European countries have more differentiated HE systems (with not only Bachelors and Masters but also sub-degree qualifications), but whether this is a helpful development depends partly upon how well HE articulates with other education and training sectors and the labour market. So before returning to this question, let us look at how qualifications reform and work-related learning and development are proceeding and the effects these may have upon HE curricula, qualifications and outcomes.

## **2. Qualifications reform**

### ***Context for the development of the EQF***

The EC (2006) proposal for the development of the EQF stresses how ‘Europe is characterised by a great diversity of education and training institutions and systems. This mirrors a widespread and strong consensus that education and training should reflect and respond to learning needs at local, regional and national level. This richness and variety of European education and training can be seen as an important asset and something which makes it possible to react rapidly and efficiently to technological and economic change.’ The proposal continues to highlight how transparency of qualifications can be seen as a necessary precondition for recognition of learning outcomes leading to qualifications. ‘Increasing transparency is important for the following reasons:

- It enables individual citizens to judge the relative value of qualifications.
- It is a prerequisite and condition for transfer and accumulation of qualifications.
- Pursuing lifelong and lifewide learning requires that individuals are able to combine and build on qualifications acquired in different settings, systems and countries. Transparent systems make it possible to judge how qualifications can be linked and/or combined.
- It improves employers' ability to judge the profile, content and relevance of qualifications on offer in the labour market.
- It allows education and training providers to compare the profile and content of their own offers to those of other providers and thus also is an important precondition for quality assurance in education and training.'

### ***Earlier initiatives designed to promote transferability***

Earlier initiatives taken at EU level, such as Council Decision 85/368/EEC of 16 July 1985, were designed to increase transparency, support transfer and facilitate the valuing of learning outcomes. They failed because the work 'proved resource-intensive and unsustainable, partly due to the centralised approach chosen and the constant and rapid evolution of qualifications' (EC, 2006). However, more recently, Ministers responsible for Higher Education in 45 European countries agreed, in Bergen in May 2005, on the adoption of an overarching qualifications framework. 'This contains learning outcomes-based descriptors for the three higher education cycles and introduces credit ranges for the first and second of these cycles. Furthermore, Ministers committed themselves to elaborate national qualifications frameworks for higher education by 2010 and underlined the importance of ensuring complementarity between the framework for the European Higher Education Area and the EQF' (EC, 2006).

### ***Details of the proposed EQF***

The core element of the EQF is a set of 8 reference levels which will act as a common and neutral reference point for education and training authorities at national and sectoral levels. The eight levels cover the entire span of qualifications from those achieved at the end of compulsory education and training to those awarded at the highest level of academic and professional and vocational education and training. The descriptors of the 8 EQF reference levels are based on learning outcomes, which are conceived as statements of what a learner knows, understands and is able to do on completion of a learning process. Learning outcomes are defined by a combination of knowledge, skills and competence. The balance between these elements will vary from qualification to qualification as the EQF covers all qualifications at all levels and academic as well as vocational qualifications. The use of learning outcomes is also seen as facilitating the validation of learning that takes place outside formal education and training institutions, which is in general seen as a key element of lifelong learning. The primary users of the EQF will be bodies in charge of national and/or sectoral qualification systems and frameworks.

### ***Level descriptors in the European Qualifications Framework***

Each of the 8 levels is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any system of qualifications. In the EQF, knowledge is described as theoretical and/or factual; skills are described as cognitive (use of logical, intuitive and creative thinking) and practical (involving manual



dexterity and the use of methods, materials, tools and instruments); competence is described in terms of responsibility and autonomy.

### **Level 1**

The learning outcomes relevant to Level 1 are:

- basic general knowledge;
- basic skills required to carry out simple tasks;
- work or study under direct supervision in a structured context.

### **Level 2**

The learning outcomes relevant to Level 2 are:

- basic factual knowledge of a field of work or study;
- basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools;
- work or study under supervision with some autonomy.

### **Level 3**

The learning outcomes relevant to Level 3 are:

- knowledge of facts, principles, processes and general concepts, in a field of work or study;
- a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information;
- take responsibility for completion of tasks in work or study;
- adapt own behaviour to circumstances in solving problems.

### **Level 4**

The learning outcomes relevant to Level 4 are:

- factual and theoretical knowledge in broad contexts within a field of work or study;
- a range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study;
- exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change;
- supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities

### **Level 5**

The learning outcomes relevant to Level 5 are:

- comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge;
- a comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems;
- exercise management and supervision in contexts of work or study activities where there is unpredictable change;

- review and develop performance of self and others.<sup>2</sup>

### **Level 6**

The learning outcomes relevant to Level 6 are:

- advanced knowledge of a field of work or study, involving a critical understanding of theories and principles;
- advanced skills, demonstrating mastery and innovation required to solve complex and unpredictable problems in a specialised field of work or study;
- manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts;
- take responsibility for managing professional development of individuals and groups.<sup>3</sup>

### **Level 7**

The learning outcomes relevant to Level 7 are:

- highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking;
- critical awareness of knowledge issues in a field and at the interface between different fields;
- specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields;
- manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches;
- take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams.<sup>4</sup>

### **Level 8**

The learning outcomes relevant to Level 8 are:

- knowledge at the most advanced frontier of a field of work or study and at the interface between fields;
- the most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice;
- demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research.<sup>5</sup>

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<sup>2</sup> The Framework for Qualifications of the European Higher Education Area provides descriptors for cycles. Each cycle descriptor offers a generic statement of typical expectations of achievements and abilities associated with qualifications that represent the end of that cycle. The descriptor for the higher education short cycle (within or linked to the first cycle), developed by the Joint Quality Initiative as part of the Bologna process, corresponds to the learning outcomes for EQF level 5.

<sup>3</sup> The descriptor for the first cycle in the Framework for Qualifications of the European Higher Education Area corresponds to the learning outcomes for EQF level 6.

<sup>4</sup> The descriptor for the second cycle in the Framework for Qualifications of the European Higher Education Area corresponds to the learning outcomes for EQF level 7.

<sup>5</sup> The descriptor for the third cycle in the Framework for Qualifications of the European Higher Education Area corresponds to the learning outcomes for EQF level 8.

Now the advantage of this approach is that it highlights how a wide range of people could benefit from HE and after completion of their programmes come out with varying configurations of knowledge, skills and competence. It is also an interesting attempt to draw together achievements in learning and development that occur in education and work settings. However, the framework treats the key concepts of knowledge, skills and competence as if they are relatively unproblematic and can be transferred fairly easily between contexts. Indeed the whole thrust of the strategy for the achievement of the Lisbon goals is that getting more people to reach levels 5 – 8 will lead to a knowledge-based economy that is the most competitive in the world. The whole argument turns on whether achievement of the learning outcomes specified in levels 5 – 8 can be delivered, mainly by HE, hence the fixation with the target of 50% of the cohort going to HE and achieving the specified learning outcomes. The transfer of these achievements into performance at work, and in the labour market more generally, is treated as if it is unproblematic.

### **3. The challenge of transfer**

However, Eraut (2005) draws attention to how 'transitions between education contexts and practice contexts are generally experienced as major causes of discontinuity. This often leads to considerable scepticism towards professional educators, partly because the discourse of professional education is rarely equipped to deal with knowledge transfer, and partly because education and practice use differently defined learning trajectories. In educational contexts, learning trajectories are aligned to aspects of academic, codified knowledge or to the skills of interacting, critical thinking and learning in a formal environment dominated by assessments. In practice settings, the trajectories are aligned to types of client and how they are treated, the performance of tasks and roles, the development and sustenance of relationships with clients and colleagues, and contributions to group or organizational activities' (p.2).

#### ***Early career transfer of learning***

The TLRP Early Career Learning Project looked at how new graduates learned in the workplace in nursing, engineering and accountancy and contributed the following ideas on issues of knowledge and skill transfer between education and workplace settings.<sup>6</sup> The following extract is drawn from Eraut (2004a)<sup>7</sup>:

‘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, 2004b). Typically it involves five inter-related stages:

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<sup>6</sup> The UK Economic and Social Research Council (ESRC) Teaching and Learning Research Programme (TLRP) is a major programme of research (2000 – 2011) that focuses on the outcomes of teaching and learning in many settings, including compulsory education, further education, higher education, workplace learning and lifelong learning. See <http://www.tlrp.org/>

<sup>7</sup> Eraut, M. (2004a) Informal learning in the workplace, *Studies in Continuing Education* 26 (2), pp. 247-273. (for a copy of the full text, see:

<http://www.tlrp.org/dspace/retrieve/226/Informal+Learning+in+the+workplace1.doc>

Note all page numbers in the text relate to this earlier draft of the article.

For further discussion of this topic, see also: Eraut, M. (2004b) Transfer of Knowledge between Education and Workplace Settings, in H.Rainbird, A.Fuller and H.Munro (Eds) *Workplace Learning in Context*, pp201-221, London, Routledge.

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

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.’ (Eraut, 2004a: p. 10, TLRP D-space entry). Emphasis in the original.

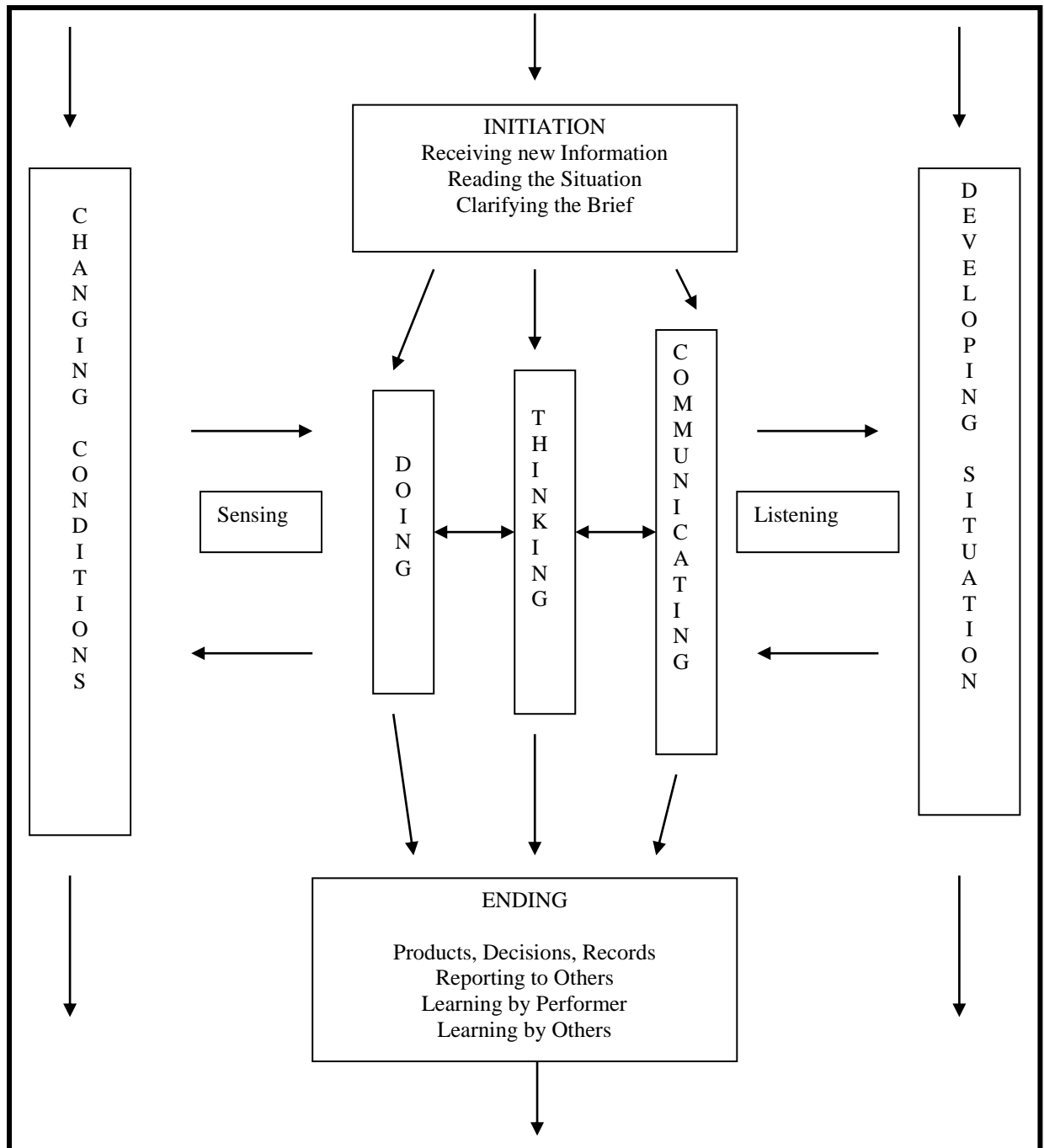
### ***Holistic nature of performance***

Eraut (2004a) goes on to draw attention to the holistic nature of performance in most workplaces. This means that:

‘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.’ (Eraut, 2004a: pp. 10-11, TLRP D-space entry).

Eraut (1994) had previously drawn attention to the scale of these problems of integration, fluency and adaptation through a schematic representation: see Figure 1 below. The period chosen for analysis can vary according to the focus and the occupation; for example one could consider a lesson, a clinic, a shift or a day.

**Figure 1: Activities During a Performance Period**



(Eraut, 2004a: p. 11, TLRP D-space entry).

Eraut (2004a) also highlights how:

‘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 a 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..... A great deal of competent behaviour depends not just 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.' (Eraut, 2004a: p. 12, TLRP D-space entry).

### ***Transfer of skills and knowledge between settings as a continuing issue***

What this means is that the transfer of skills and knowledge between settings (not just between education and work) is multi-dimensional – it is not a question of just transferring particular skills or specific knowledge. Similarly, even if a person is able to produce competent performance in a more or less 'ideal' work setting (with relaxed time and resource constraints), this can be quite a different proposition from reaching 'experienced worker' status. This point is reinforced by reference to companies, working in technologically advanced sectors, who build up competence inventories of their staff: they differentiate between:

- Those who are technically able to perform a task but have very limited practical experience of actually doing so (e.g. could use in an emergency or, if necessary, for a one-off activity);
- Those who have successfully performed the task on a small number of occasions (e.g. could use if wish to develop their expertise further; in a support role or if time is not necessarily a key criterion);
- Those who have performed the task many times and under a variety of conditions (i.e. experienced worker standard – completely reliable);
- Those who have substantial experience but are also able to support the learning of others (i.e. they can perform a coaching or mentoring role);
- Those who are world class, that is they are able to think through and, if necessary, bring about changes in the ways that tasks are tackled (e.g. could be chosen as a team leader for performance improvement activities).

The interesting thing here is that this approach to personal professional development emphasises the importance of the recontextualisation of skills, knowledge and experience and, in this sense, recognises there are continuing challenges in relation to the transfer of skills and knowledge. You may also perform relatively much better at one level than another – most obviously in that coaching others and thinking in new ways require different skills sets compared to the standard view of expert performance (third of the five levels specified above).

### ***Importance of recontextualisation of skills, knowledge and experience***

It is striking that the level descriptors of the EQF do not engage with the issue of the recontextualisation of skills, knowledge and experience. However, there have been many examples in HE where curricula have included work placements or have

adopted a curriculum around practice-based enquiry or problem-based learning.<sup>8</sup> These approaches, however, often use considerable amounts of staff time. They may also have unintended consequences. The training of radiographers in the UK is much more demanding than general undergraduate science courses, mainly because the trainees spend considerable time in hospitals learning through working. In a three year period they are actively engaged in learning for over 50% more time than conventional undergraduates, they have to cope with learning in two very different contexts and they experience first hand what it is like 'to be a radiographer.' As a consequence, some years ago, on some courses only a minority of their graduates became radiographers. This was because as science graduates they had a choice of careers available to them, many of which were better paid and less stressful. The situation of radiographers has improved since then with the introduction of a recognisable career ladder and increased pay, but the major reason many did not enter the profession at that time was how they were treated by medical staff. The training served as a realistic introduction as to what it was like to be a radiographer and have your work undervalued by colleagues. If you do equip people with the ability to recontextualise their skills, knowledge and experience, they will feel they have a wider range of career choices.

### ***Recontextualisation of skills, knowledge and experience in practice***

If recontextualisation of skills, knowledge and experience is of key importance, it is worth looking again at the TLRP Early Career Learning Project, which has some interesting things to say on this topic too.<sup>9</sup> Their focus on how new graduates learned in the workplace in nursing, engineering and accountancy meant there was a contrast between the predominantly education-based pathways of the first two professions with the predominantly work-based training pathway of the trainee accountants. For those workers, such as nurses, from a predominantly education-based pathway transfer into a fully operational work setting can be traumatic. Eraut (2003) recalls how the first round of interviews with newly qualified graduate nurses produced an apparently gloomy picture:

"The nurses have already qualified but still have a difficult transition, caused by their sudden assumption of a great deal of responsibility and immersion into a highly demanding, pressurised environment with a very high workload. Critical features of this transition are:

- learning to manage their time, to prioritise the numerous demands upon them, and to recognise when patients need urgent attention
- being given immediate responsibility before the above has been achieved
- learning how to handle a whole range of challenging communication tasks and relationships with doctors, colleagues, other professionals, patients and relatives
- taking responsibility for the administration of drugs according to a wide range of schedules and using several different methods, while still attending to the needs of a considerable number of patients
- coping with shifts when they may have very little support

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<sup>8</sup> The University of Maastricht itself consciously sought to use problem-based learning as a curricular approach from when it was first established as a university.

<sup>9</sup> Note this is one of the few TLRP workplace learning projects to have been completed so far.

- learning a range of new procedures with varying levels of help
- peripheral learning is limited by the urgent demands on their attention, often limited contact with other members of their peer group, varying levels of support from more experienced nurses
- access to relevant short courses is often constrained by staffing shortages.

**They are all quite critical of their training, especially the disjunction between theory and practice, the lack of attention to scientific knowledge,** and the pattern of work placements. Most of them are thinking about their next move, often to a more specialist ward in the same hospital” (Eraut, 2003, p. 4), emphasis added.

Now this looks catastrophic and would seem to suggest the major recent changes to the nursing curricula have been unsuccessful. Their training does not seem to have equipped them with Level 6 learning outcome ‘manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts.’ However, the longitudinal tracking of the nurses throws up this example, just eighteen months later. This is the case of one nurse, but is representative of their rapid general learning and development once they are in work:

“After 20 months, she continued to emphasise her need to be in control and finish her writing. **Her time management was better and she needed less support. She had stopped receiving supervision, after 8 months and had started self-directed reading on relevant issues.** She had become IV trained [that is she was able to administer intra-venous injections] and had been on several short courses - basic life support, advanced life support, pain management, central lines. **She wanted to start taking a degree** by stages over a long period. **She had begun to mentor students, and had taken on management responsibilities when people hadn’t turned up.** She had quite enjoyed it, and had ‘picked up aspects of what is expected of a co-ordinator or team leader’, but wasn’t seeking that role yet. She gets significant support, both socially and at work, from a group who joined the unit at the same time as her and have ‘gelled.’ This was also recognised by her manager.

There are many tasks in which she is now more confident. **She is more aware of her learning through practice without noticing it at the time.** Dealing with very ill people is becoming more routine. She is prepared to do fewer observations than requested if she realises it is not necessary to do them so frequently. She is about to go on a High Dependence Unit course and expects to get a better ‘scientific’ understanding of ‘what is actually happening’ with things like blood gasses. She believes that novices need clear protocols **but more experienced nurses develop a more holistic awareness”** (Eraut, 2003, p. 6). Emphasis added.

### ***Much more positive attitude towards learning in retrospect***

So rather than a negative attitude towards theoretical learning this nurse now wants to build up her theoretical understanding both in formal education and in work. She also wants to support the learning of other students. Thus it is not that the knowledge and



understanding has little value, it is rather that at the point of transition, and shortly afterwards, the former students wish they were better prepared for their immersion into the demands of work. In practice, this may be less an issue of how they were prepared than in how they are supported in the transition period. Also a more work-based transition may not address the real sources of stress – nurses even on education-based pathways spend a good deal of time in hospitals, on wards and with patients: it is the transition to having direct responsibility for patients and having to think about what you are doing all the time that provides the pressure. The latter point is important in that nurses fully trained on the job would still feel the latter pressure – they might handle some cases better because they had greater practical experience and thereby recognized what was required, but they could struggle in other areas because the lack of a theoretical understanding meant that it was harder to recognize analytical patterns in their work: for example, under what conditions is a change in patient readings problematic and so on.

### ***Different strengths of different approaches to learning and development***

That is, work-based training routes may help learners with their intuitive pattern recognition of types of problems because of their greater exposure to a range of situations, but if a situation requires a more considered response then those that have greater theoretical and analytical understanding may have an advantage, at least when they are not feeling overwhelmed by all the other aspects of the situation. Eraut (2004a) argues that people may assess situations almost instantly by pattern recognition, less rapidly by drawing on their intuitive understanding of the situation, and finally more deliberately by using reflection and analysis. Intuitive understanding signifies some familiarity with most or all aspects of the situation. Such a failure to make a rapid decision could be either because no sensible option readily came to mind, or because the consequences associated with the outcome suggest that the original understanding should be checked before taking any further action.

This is probably why there has been the shift towards more education-based training for nurses – more practically trained nurses could probably be trusted to make the right decisions in most cases based on experience and intuition, but we, as patients, feel safer if they also know why those decisions are correct and can also recognise when intuition may be an unreliable guide. Additionally, intuitive understanding is often not fully challenged until somebody is forced to deliberate between two or more options, and consequently expresses a strong preference for one particular option because they suddenly feel that it fits the situation much better than the alternatives (Eraut, 2004a). Those that rely almost exclusively upon intuitive understanding may not recognise there are alternatives, whereas those who have a deeper theoretical understanding not only do so, but in the early stages of their practice are slowed up by thinking of possible alternatives even when a quick intuitive action would be sufficient.

Interestingly, in circumstances where the consequences of mistakes by trainees are largely reversible and retrievable, such as in accountancy, then a work-based training route does have distinct advantages in getting trainees up to practical competence as quickly as possible. This is because of the value of almost continuous exposure to real practice. Reber (1993) demonstrated that implicit learning occurs as episodes that are not recalled may nevertheless affect later performance. Eraut (2004a) therefore argues that it is reasonable to assume that information can be used without a person being

aware of doing so, even if the episode from within which that information was obtained is itself being explicitly recalled. Such implicit use of information can be cumulatively aggregated in memory across the perceptions of many previous episodes and so lead to an intuitive understanding of a situation. In accountancy training the sheer volume of practice and the constrained variety of situations with which trainees have to deal (all similar but different) means that trainees get to instinctively 'know' whether particular actions are appropriate so rapidly, that more senior trainees are used to train more junior trainees. Explaining when you have accumulated sufficient evidence of a particular type within an audit for you to move on is partly intuitive, even if many other aspects of the audit are based on clear rubrics and formalised procedures.

### ***Different types of knowledge***

Application of these ideas do not just apply to accounting, however, as Eraut (2004a) points out how 'throughout our lives we make assumptions about people, situations and organisations 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' (p.7) (even if sometimes this 'knowledge' lets us down). 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 is biased: in any occupation it is possible to 'misread' situations and take inappropriate action even when we intuitively felt that action was right, and even when acting in that way has proved appropriate in the past.

It is only when the 'misreading' does not lead to any reflective action that we should really be concerned. Eraut (2004a) argues that these tacit readings of situations could be construed as personal knowledge or ways of handling situations and they become problematic when they are used uncritically. Their uncritical use could be because people either believe that it works well for them, they do not know of any alternative, 'or lack the time and/or disposition to search for anything better – the latter being 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 out 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 *et al.*, 2004)' (Eraut 2004a, p.7).

Eraut (2004a) points out 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 it is only on a few occasions that they deliberately stop to think about a particular kind of case; but then 'they cannot explain how that accumulated experience enables them to instantly address a new case by recognising a pattern and activating a readily available script, which they never consciously attempted to compile. Indeed, the research literature on expertise consistently finds that the distinguishing feature of experts is not how much they know, but their ability to use their knowledge, because that knowledge has been implicitly organised as a result of considerable experience for rapid, efficient and effective use (Schmidt and Boshuizen, 1993)' (Eraut, 2004a, pp. 7-8).

### ***Importance of the integration of different kinds of knowledge***

Professionals often find that the most important workplace tasks and problems require the integrated use of several different kinds of knowledge, and this can be particularly challenging for those just 'starting out' in their careers. This is the real challenge: predominantly education-based routes and predominantly work-based routes will lead to the development of different types of knowledge, **but in many occupations either will be insufficient as it is the combination and integration of different types of knowledge that is often the major challenge.** From this perspective looking at the transition from one form of training to work is really focusing upon the wrong transition – the key transition is not from training to work, but from training to experienced worker status. This shift of perspective would enable people to look at immediate post-qualifying period as a time in which a great deal of learning takes place and to recognise that the degree of support an individual receives at that time could have more significance for their ultimate success than the type of pathway they followed in training. People early in their careers learn a great deal from challenges at work, provided that they receive support as required, because without this they feel overwhelmed and may start to lack confidence in their own abilities. Eraut *et al.* (2004) highlight how people learn most effectively when a virtuous circle of confidence, support and challenge is created.

Now eighteen months after completion of formal training there is little doubt that this nurse, like virtually all her contemporaries, has indeed exhibited the Level 6 learning outcome 'manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts.' So what does this mean for our earlier discussion on qualifications and levels – it might be more realistic to say that upon completion of one of the HE cycles the graduate has achieved some of the required learning outcomes and is on a learning trajectory whereby he or she will, following appropriate support, be able to demonstrate attainment of some of the others in a new context after a period of learning while working. Also it will often be the combination and integration of different types of knowledge that is the major challenge for most people making significant changes into or between work contexts. Further it is often the case that performance at work does not depend simply on doing high level activities well, but on improvement in the performance of a range of activities at different levels.<sup>10</sup>

## **4. The challenge of continuous improvement in the workplace**

The focus upon levels, qualifications and learning outcomes is also a misdirection in that it can draw attention to the need for people to become more highly qualified (in terms of moving towards a higher level), when in order to become more skilled and more effective in terms of improvement of their performance it would be beneficial to pay attention to the development of their skills, knowledge and understanding at lower levels. An example of this was a materials scientist with a PhD who admitted his contribution to a performance improvement team was greatly hampered by his inability to communicate effectively with people without his level of expertise.

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<sup>10</sup> Criticism of graduates is often framed in these terms – they are reputed not to be able to do simple tasks well – but they have been in an environment where very often you are able to leave certain achievements at lower levels behind you, or else they have just not been exposed to certain activities that they meet routinely in the workplace.

The purpose of outlining the following 'case stories' is to show how substantive and effective work-based learning may involve learning and development of skills, knowledge and competence at a variety of levels, with most employees not being concerned about qualifications or levels, and learning and development being principally regarded as processes designed to effect improvements in organisational effectiveness. These cases look at the learning and development that occurred following the formation of regional supply chain networks in the automotive and aerospace sectors (Brown *et al.*, 2004). These partnerships involved small and medium size enterprises (SMEs), often linked to a larger company, through inter-company learning networks that were supported by specialist tutors and had a strong focus on both immediate performance improvements and personal educational development.

### ***Regional supply chain networks***

The underlying pedagogical idea was that there is considerable value in attempting to link processes of knowledge creation with tackling the core problems of manufacturing practice as a means of engaging learners that have traditionally been difficult for educational institutions to reach. The model of learning used with its emphasis upon networking, knowledge creation, linking an initial focus upon performance with a progressive broadening of ideas about learning and development was particularly well suited to its context: supporting learning and development in advanced supply chains. This approach has now been adopted and adapted by a range of education and training providers, but has been particularly popular by those seeking to support regional networks. For example, the Northwest Automotive Alliance (NAA) collaborates with national organisations such as the Society for Motor Manufacturers and Traders (SMMT) Industry Forum and the Automotive Academy in delivering their regional programme.

All three organisations are involved in the design, brokerage or delivery of collaborative training scheme designed to improve manufacturing processes and to increase competitiveness of companies throughout the automotive supply chain. So, for example, the SMMT Industry Forum provision typically involves programmes that are practical, shop-floor based, process-improvement activities implemented with a 'hands on' approach delivered by a team of Industry Forum Engineers in ways that include tutor-led workshops and engaging in team-based process improvement activities. The work with a company's employees at a number of levels is expected to bring about tangible benefits in terms of improvements in relation to quality, cost and delivery and subsequently in terms of sales and profitability. The provision is part of a co-ordinated supplier development programme that has regional and national dimensions. To give an indication of the scale of provision the Supplier Development Group of the NAA that is seeking to facilitate Northwest automotive companies in accessing best practice manufacturing support aims to involve 50 companies in networks of 4 to 8 companies and a total number of participants of perhaps 80, with a mix of employees from semi-skilled operators through to senior managers.

The approach adopted is based upon the principles of Lean Manufacturing and the programmes take a practical view of the requisite tools and techniques. Participants are introduced to the ideas but also have the opportunity to experience them in context thus gaining knowledge of the improvements that can be expected through the application of the different tools and techniques.

***The learning opportunities are located both in practice-oriented workshops and then applied in productive work processes or in settings such as training workshops.***

One key element in these networks related to the role of the Master Engineers who would run workshops and then lead teams to focus on key problems of manufacturing practice in the workplace itself. This ensured attention was given to problems and dilemmas that are central to manufacturing practice and have significance both for individual and organisational performance. The problems are likely to contain combinations of practical concerns, organisational issues and socio-cultural problems. This approach to process improvement was underpinned by delivery of a range of programmes on Supply Chains; Team Leader Training; and Value Stream Mapping. The learning objectives were taken from established programmes of training, development and continuous improvement that were explicitly modelled on the 'best practice' followed by Japanese companies. The programmes started over a decade ago and are effectively driven by employers, although both government and individuals with a training background have had some influence in the design of programmes.

The learning achievements seem to have greatest relevance and recognition within the context of the individual companies, resulting in individuals taking on new duties or a wider range of activities. The opportunities individuals have for aligning their learning achievements with the educational system in general (in the form of credits or units) are not always taken up, although arrangements for credit accumulation and transfer and accreditation of prior learning mean that achievements can be formally recognised if required (the total learning time, however, often does not exceed say fifteen days). The focus of the Master Engineers and the group of learners upon making real improvements in manufacturing practice and process at one level could fit with ideas about the collaborative creation of new knowledge. The approach to learning through networking could be seen as an example of an active model of learning whereby learners are engaged in the creation of 'new contextualised' knowledge, not recipients of a largely passive process of knowledge transmission. In the networks there was value in learning as a member of a group, including from others with a variety of backgrounds.

### ***Value Stream Mapping***

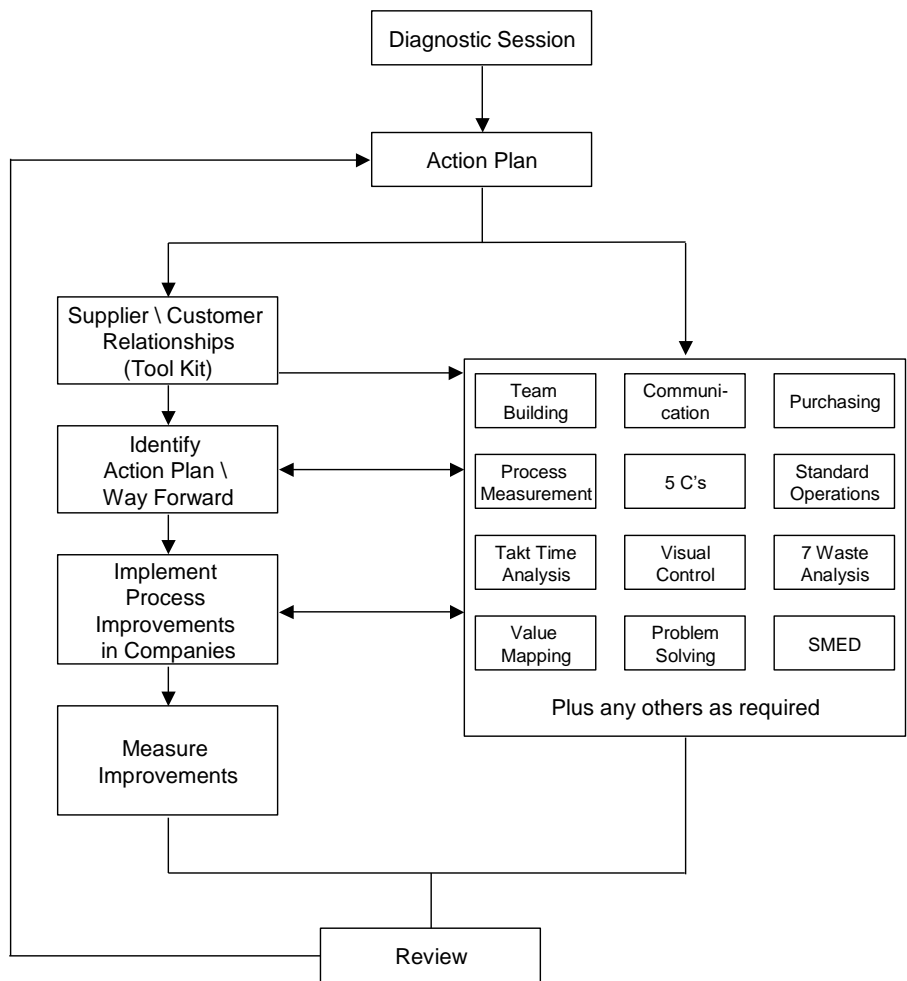
One of the courses available in a suite of improvement programmes would typically be a two day course on value stream mapping. The structured application of Lean Principles through Value Stream Mapping can help put the opportunities for improvement into context and provide a clear overview of the possible problems and opportunities. The Value Stream Mapping course would typically show participants how to develop a Current State Map and identify key issues, involve them in developing an Ideal State as a means of challenging fixed ideas about how things are currently done and then support the participants in developing a first Future State Map. The next stage, however, is crucial for learning and development as it involves actually implementing the first steps of the Future State Map in the weeks following the course. The course utilises knowledge from this and other real applications to examine the approach needed to drive and sustain process improvement.

### ***Organisational structure***

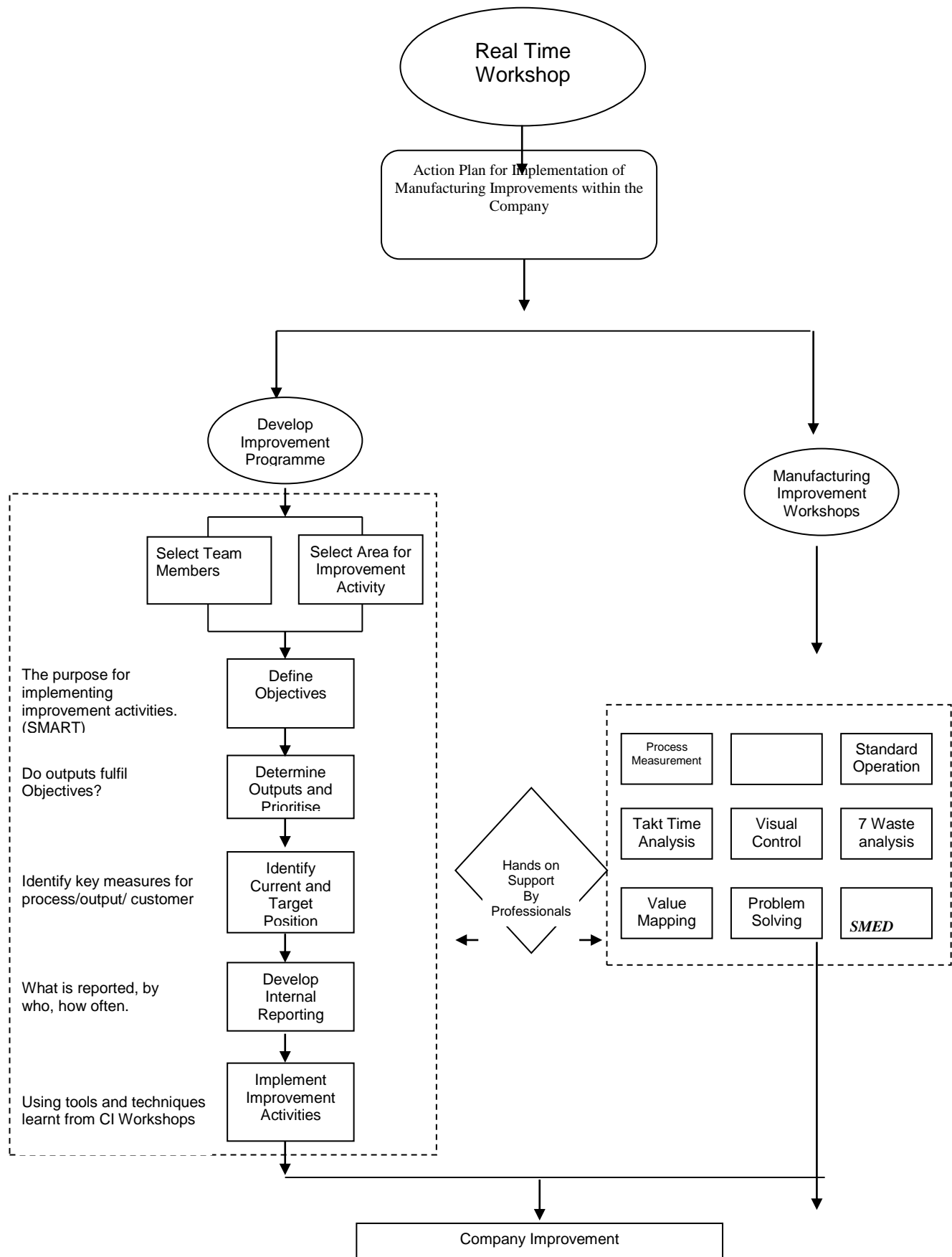
The structure of the work learning partnership is a voluntary network with individual companies choosing to subscribe to particular learning workshops and activities,

although smaller companies may be encouraged to participate by a larger company in the same supply chain. The networks, workshops and other activities are also facilitated by regional and/or sectoral organisations that themselves receive support from regional and/or central government. Hence there are a range of learning facilitators or brokers involved in the set-up, support and delivery of learning programmes and activities as part of the operation of the overall network. What this means is that the organisation of particular learning programmes can involve a wide range of stake-holders, including those companies supplying the learners. The whole structure is co-operative, and the participating firms have a role in both the co-ordination of activities and in the development of particular learning programmes, although particular combinations of activities can be chosen from or based around a suite of workshops concerned with issues like Supply Chains; Team Leader Training; and Value Stream Mapping. The organisational and management structure of the networks appear well adapted to respond to the learning needs of companies and individuals – they operate as intermediary organisations supporting the learning of individuals, companies and the sector as a whole, coupled with also having an explicit regional development role as part of explicit programmes of manufacturing improvement. How this approach may play out in a network and in a single company is illustrated in Figures 1 and 2.

**Figure 1 – Continuous Improvement in the Automotive Sector**



**Figure 2: Manufacturing Improvement Programme as experienced by a single company**



***Examples of learning of individuals involved in the supply chain networks***  
**Production Manager of medium size press engineering company with 65 employees, organised around 9 production cells of 4-6 people setting and operating the presses.**

- Using data to tackle issues: the training had led to a more systematic approach to solving problems. Previously management had tried to sort out problems without the necessary data on performance etc. Also they did not check out how well the 'solution' worked - there was a tendency just to plan and do, without the checking stage. Now they collect detailed data on performance of presses and other shop-floor activities. The breakdown of time spent on the presses enables management to identify the 'real problems', rather than acting on their perceptions of the problems. For example, one of the seven measures they now use is of overall equipment effectiveness (OEE) and on one of the presses they thought they had problems with quality, but the data showed the problems related to productivity and availability rather than quality issues per se.
- OEE was a key issue in that this led to improved teamwork and motivation as the practical work of the improvement team was seen to lead to real improvements in performance.
- An attempt to achieve sustainability: the 5C's approach was being attempted in two cells in addition to the one directly involved in the first training workshop. [Note there are nine cells in total.] Monthly improvement meetings of the cells were held focusing on 5C's activities: reviewing progress, outstanding problems, follow-up sheets and whether there were any outstanding 'red tags'. The check sheets provided information on 4 of the '7 wastes' (some such as line balancing were not appropriate to the company's operations). The meetings set deadlines for completion of activities. The meetings acted to ensure that the team was not always focused upon the requirements of immediate production. Eventually the monthly meetings would be run by the cell leaders, without direct support of the production manager. The plan over the next 18 months to two years was to introduce a good 5C's structure throughout the company and then use this as a basis of further improvements in areas like set-up reductions.
- Demonstrable improvements in Quality, Cost and Delivery (and improved profitability) over the eight months since the changes were implemented. The operators now used pre set-up checklists and set-up reduction exercises had reduced the set-up time on one machine by 51% and its availability had increased from 61 to 72%. One press had problems with tooling - those tools going in and out of the machine - the data was used to identify the problem tools and this is the next issue to be tackled.
- Senior management commitment: one senior manager attended the training and after completion of the initial three day workshop the team made presentations to the senior management team. Another way in order to ensure senior management ownership and understanding of the process was to put the director who had attended the workshop in charge of supervising the collection of OEE data for one cell. He then understood how poor the OEE was and that something had to be done. He then became centrally involved in implementing changes in that cell. An additional sign of their commitment to the process was that they employed another person explicitly to free up sufficient time of the production manager to follow through on the improvement programme. Initially the production manager's time had become increasingly stretched. Subsequently the company was be involved in two further training workshops led by Industry Forum (IF) Master Engineers.



The production manager hoped that it would be possible to continue with half-yearly meetings of change agents from other companies in the network, especially as people often had complementary expertise. There were some problems initially with the training workshop process, largely because the lead company had not devoted sufficient time to preparation for the event. [It may be significant that that factory had subsequently been closed.]

The company operate just in time production systems, and this makes devoting time for continuous improvement quite difficult, because cells cannot be closed down without prior planning. That is, stock has to be put into the system in order to release people for workshops and improvement meetings. Supplying the automotive supplier around whom the network was based only involved one of the company's nine cells, with their biggest customers being involved in the production of keys, locks, safes and other security systems.

**Quality engineer in a medium size automotive parts supplier in the Midlands, with 85 employees, 50 of whom work on production as operators.**

The company produces parts, such as tubes used in the manufacture of steering systems, for larger component suppliers. He is very positive about the change agent training undertaken. He went to the initial workshop with an open mind, but once into the programme he found it 'very interesting. Before the second week of the workshop I had already set up one area (the welding machine shop) and through the application of the tools and techniques we had improved the production to 110 parts per hour from the original 60 parts per hour. Tasks were carried out in a systematic way, the not right first time rate improved and the cleaning time for the new shroud jigs was shortened from 15 minutes to 3 minutes.' After the second workshop 5Cs and the 7 wastes were applied and the SMMT engineers and lead company supply chain people focused upon the performance of a second welding machine. 'The overall equipment effectiveness improved from 65 to 82%, and it has averaged between 79 and 82% since then.'

The initial benefits were clear, and since then 'I have pushed on and on with the project base. Seven different sections are involved now and I always worked with teams that were keen: numbers have increased from the original 3 to about 20 now.' The intention was always to work in areas where it was 'safe to try to bring about change and other people are now involved in the process of bringing about change'. Other benefits included housekeeping improvements and the red tags proved useful. The factory is a happier place now and 'one operator remarked that it is better now than it has ever been'. The financial benefits were also apparent: 'on one part we were making a 1.5p loss on each part, but since the improvements we have given the customer a 1.5p price cut and now make 2p profit on each part'.

He has cascaded the IF approach whereby he has passed on all his knowledge to the Head of Production. This has been successful and now he just works on the OEE. He has used all the techniques and if he did move on to another job he would apply these regarding a new set of activities. He considers himself to be a 'better teacher than student' when it comes to passing on information, including in some cases to customers. Their approach was to work with small groups of four people, as the traditional approach of working with groups on production lines with relatively long

runs was not appropriate here. One of the striking things is just how quickly you can improve an area: applying the 5Cs in 30 minutes. You can do it and then look for further improvements over time. 'The 5Cs have proved the most useful technique in our context'.

The main difficulties encountered, and the attempts to overcome these, were:

- Measuring the productivity of assembly areas, so used people productivity
- Only three people were not interested in the approach at all, so decided to leave them till last
- The key issue is whether it will be possible to protect the time for teams to meet for half an hour each week. Even though teams have found it useful coming together for these meetings and people have learned from each other. Indeed recent success, in which the company has gone from strength to strength, has meant that they now have so much work to do that this time would be squeezed.

Overall, the project has been very successful and 'a quarter of factory personnel are effectively working as change agents'. They have 'won orders for 38 new components in the last three months. The company looks much more impressive - you can see the difference over the last six months. I am sure this was a factor in the decisions to place new orders. For example, with company X we had had no new component orders for five years, and now we have had six in the last three months. Management can see the 'very clear results and give full support for the programme. They also value and have given support to education and training, including certificated learning and a variety of short training programmes.

### ***Conclusions***

The case stories have demonstrated that the outcomes of the learning processes could be viewed under different aspects such as learning at the individual, group and company levels. The evaluation of individual learning showed that the extent to which learning opportunities were realised and learning objectives achieved depended very significantly on the extent to which there was senior management support for and willingness to release the resources necessary to sustain a programme of process improvement both in the short term and over a longer period. What is clear is that where such support was forthcoming there were clear improvements in group performance and evidence of organisational learning in that new approaches to process improvement were adopted.

At an individual level it was also clear that for those most heavily involved the learning processes resulted in significant personal development, whereby career prospects and opportunities in the labour market were improved and further learning was encouraged and in some cases actually undertaken. The specific tools and approaches used in these workplace learning partnerships were widely applicable, but the effectiveness of their use in practice depends almost wholly upon whether the organisation 'buys into' a programme of process improvement.

Now what is of interest to us in the present context is that these programmes of learning and development are taking place largely outside formal systems of education and training and, although they could result in very significant learning and development at the level of the individual, team and the organisation the learning was not accredited in any way. The lesson to be learned here is that there is significant

learning and development that occurs in the workplace and, as this does have implications for the Lisbon goals, it should give pause for thought about the fixation with the Lisbon targets. Also if these types of activities were more widespread it would take the pressure of HE institutions in having to ‘pack’ their curricula, as there would be more recognition that skills, knowledge and competence continue to be developed in work contexts after completion of HE programmes of study.

## 5. The challenge of the development of ‘skilled incompetence’ in successful small companies

The third way the focus upon levels, qualifications and learning outcomes can misdirect attention is that it gives the impression that learning at a particular level can be considered complete: the learning outcomes have been achieved. Even at level 8 there is the notion that the learning outcome ‘demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research’ has been achieved. Whereas in practice, such attitudes can lead to what Argyris (1990) called ‘skilled incompetence’, where the focus on doing current activities well can nevertheless result in neglect of professional growth and development to the long-term detriment of the organisation.

Brown (2005) highlights how the success of small companies could partly depend on the way they handled, either explicitly or implicitly, two key challenges: how to focus upon, protect and develop their core competencies and how to avoid the gradual development of ‘skilled incompetence’. The case studies showed that companies were often quite good at protecting and developing their core competencies, even if was not a formal goal. Meeting the challenge of the development of ‘skilled incompetence’ (Argyris, 1990) was much more demanding. For some companies the **current way of doing things**, including the constant search for and focus upon technical development, **meant they neglected more strategic considerations**, including plans for the professional growth of staff and opportunities to reflect systematically on their ways of interacting externally.

Several effects of the accumulation of ‘skilled incompetence’ (Argyris, 1990) might be expected in an organisation that does not develop specific plans for professional growth. A company’s small-size allows fast knowledge sharing among people, ensuring less dependence on a single resource and improves role flexibility. Yet the company’s model of investment on human resources should be developed in order to comply with conditions of both keeping key human resources and achieving long-term objectives. Moreover, the occurrence of significant reshaping of technological activities due to breakthrough events, or even to the effects of incremental innovation in the field, might cause unforeseen problems in an organisation which does not systematically reflect on its ways of interacting externally, its community practices, and its approach to applying technological solutions. In such circumstances public policy should be directed at offering support for apparently dynamic and healthy companies in looking at the broader horizon and considering the company as a unity – not only in terms of its individual members – and should take specifically into account its existing external and internal learning paths.

So, rather than an expectation that HE will deliver graduates who have completed their intellectual development to the requisite level, it would be more useful for the development of a knowledge-based society to recognise that thinking in these terms is itself problematic. Additionally, public policy should seek to support the learning and development of staff in small companies that are apparently thriving, because it is at that time that support for further professional development is likely to be squeezed and a drift towards 'skilled incompetence' might be underway, with negative consequences for the development of a knowledge-based society.

## **6. Conclusion**

My contention is that the way to move towards a more knowledge-based society is for as many people as possible, whatever their supposed highest overall 'level' of skills, knowledge and competence, to believe that they should seek to develop their skills, knowledge and competence at a number of levels (including those below as well as above their current highest 'level'). Additionally, rather than having an essentially binary conception of competence at the heart of the levels, where it has either been reached or not, it would be far more beneficial in inducing the frame of mind required of a knowledge-based society to have a developmental view of expertise. This could be on the following lines:

- technically able to perform a task but have very limited practical experience of actually doing so;
- have successfully performed the task on a number of occasions;
- have performed the task many times and under a variety of conditions (i.e. experienced worker standard);
- have substantial experience but are also able to support the learning of others (i.e. can perform a coaching or mentoring role);
- world class, those who are able to think through and, if necessary, bring about changes in the ways that tasks are tackled.

Such an approach would immediately address the issue of transfer – most graduates from HE would still be, and crucially under this model everyone would expect them to be, some way from 'experienced worker standard' when they completed their initial training. This approach could also provide the conditions in which a commitment to continuous improvement could flourish, not only would most people believe that they needed to develop in a number of ways (at a range of 'levels') in order to improve their performance, but also the 'working coaches' so critical to supporting the learning of others would increasingly be in place. Thinking about the nursing example from earlier, do you think their post-qualifying experience would be transformed if it was widely recognised that they needed continuing support and that some of the slightly more experienced nurses had developed their skills of supporting the learning and development of others? Additionally, this approach of continuing to expect people to continue to develop a range of skills and to have a broad conception of expertise would seem to offer some protection against the development of 'skilled incompetence' because continuing professional development and growth would be recognised as being strategically important.

So, the Bologna Process may help open up higher education systems to a wider range of students, who are able to leave HE upon completion of a range of different

programmes, and increased transparency of qualifications may also be a welcome development. However, as the Bologna Process has become entwined with the development of the European Qualifications Framework there are real dangers that the focus upon levels, learning outcomes and qualifications will result in a misdirection from the goals of the Lisbon process towards the proxy for these goals (a more highly qualified workforce). If we are to move towards a knowledge-based society we need to focus more upon supporting the processes of learning and development, and to adopt a more expansive view of the nature of skills, knowledge and competence than that enshrined in the current manifestation of the NQF levels. This more expansive view will pay particular attention to the need to address issues of transfer of skills, knowledge and experience between different settings; how to support individuals in developing a frame of mind whereby they continually look to improve their own performance through learning and development and to support the learning and development of others; and to recognise that in any organisation a commitment to continuing growth and development of its members is strategically important. In this view HE should seek to help graduates move in the direction of chosen learning outcomes but their achievement should be regarded as partial – the value of HE can probably only be properly judged some time after graduates have been applying their skills, knowledge and experience in other settings.

Overall, this argument about the need to pay greater attention to learning at the workplace is not an argument for a particular type of HE programme. A more coherent and comprehensive view of the type of learning and development required to support continuing learning at work can interact with a wide range of HE provision that varies according to subject, breadth, depth and timing. So this final section will draw out some ways in which learning in HE and at work may interact, drawing upon the findings of Brown (2005), so as to promote a discussion about the implications for the development of HE programmes of study.

### **Importance of formal knowledge development**

‘Learning’ at work is often intimately bound up with ‘sense-making’: interacting within communities and networks is a fundamental way for constantly re-building personal cognitive approaches to specific issues and re-constructing the sense of the whole work experience. However, even where experiential and social learning are widely diffused, formal approaches to learning can help in a wider process of sense-making. That is, even where codified knowledge is spread through a mixture of diffusion through communities coupled with self-learning practices, formal approaches to learning can potentially take sense-making to a new level, not least through a process of systematic engagement with cognitive and imaginative faculties not necessarily always used in more regular activities at work.

### **Learning through competence development and growth of work process knowledge**

Competence development at work is often linked to the acquisition not only of specialised knowledge concerning technical aspects of the work processes but also to relational aspects. These were based on the interplay between different roles and activities within organisations and the ability to interact effectively with clients, suppliers, competitors and other people external to the organisation. There was a sense in which the development of a thorough work process knowledge (Boreham *et al.*, 2002) was an important goal of individual learning and sense-making and the

platform for further learning and achievement of acknowledged expertise. Work process knowledge is that knowledge of the business production and labour processes in the organisation which is created and circulated through co-operative arrangements at different levels of an organisation, allowing continuous learning and process improvements.

### **Responding to the trend for learning and working to move closer together**

One clear trend within workplace learning is the extent to which working and learning for many workers are drawing closer together. In particular, there is an increasing awareness that learning and motivation are influenced if activities are embedded in contexts that make sense and are important for the learner (Raizen, 1994). Although there may also be times it is important for the learners that some distance is put between learning and work, so as to generate breadth of perspective. Indeed Eraut (1994) raises the question of whether successful workplace practice can necessarily be equated with a capacity to understand the ideas and concepts that inform such actions or to transfer them successfully to other contexts. For example, experienced practitioners may be seeking broader perspectives, theoretical understanding and so on. Engeström (1994) also points to the contribution theoretical concepts can make to assist individuals to understand what they are doing and why work practices are subject to change. So while meaning for the learner may often be increased by getting closer to working processes, in other cases putting greater distance between learning and working may be appropriate. **This means while there is often value in promoting learning while working, but it is also vital to acknowledge that there are other circumstances where it is important for the purposes of learning to put some distance between learning and working.**

### **Problematising the link between learning at work and qualifications**

Is it possible to offer institutional support to a system that looks to develop employees in ways considered to be meaningful by the individuals concerned (rather than necessarily fitting the requirements of formal education and training)? In such an approach the formative nature to competence development could mean that the focus is upon where does the individual go from here in the light of the competences they (believe they) possess. This could be an inclusive process open to all, whether or not they want to seek formal qualifications, have their existing competences recognised, or undertake formal education or training. The key point here is that the competence review looks forward and focuses upon individual learning and development. It is also important to build a stronger dialogical element into those cases where a link between non-formal learning and formal qualifications is appropriate. Reflective dialogue and evaluation can be used to broaden and deepen learning in the workplace (and in part compensate for the possible narrowness of experience in the work tasks performed by an individual).

In a number of contexts, there was also a feeling that some types of qualifications were not at the right level of aggregation. It may be helpful to introduce assessment of the key aspects that underpin effective performance as an experienced skilled worker. Note some large companies are seeking to specify their skilled worker requirements in terms of say 6 -12 major activities crucial to effective performance.

### **Responding to the challenge of developing new forms of continuing learning**

In terms of an overall strategic approach continuing learning should reflect a broad-scope perspective on the nature of knowledge and competencies, especially in rapidly changing technology-based processes. Knowledge needed within such processes cannot be treated anymore only in terms of know-what (information about the explicit aspects of work activities) as is typical of many initiatives (courses) in this field. Dealing with such processes also requires continuously accrued competencies in terms of know-how (based on awareness of the effects of the tacit cognitive components of work activities), know-why (i.e. continuously updated understanding of the scientific principles underpinning technologies and other aspects of work activities), know-who (regarding the social side of work activities) (Lundvall, 1992; Lundvall and Borrás, 1999). This implies a new conception of continuing learning interventions, in which informal learning and the different modes of conversion of explicit knowledge into tacit knowledge and vice versa could also be taken into account (Nonaka, 1994; Tomassini 2003).

### **Support for companies to move towards more expansive learning beyond the immediate context and thus overcome the problem of ‘skilled incompetence’.**

Many of the technical staff who had engaged in substantive learning through working in process improvement or project teams recognised the value (and potential transferability) of the skills they were developing and this contributed to their commitment towards learning. For example, the skills required in coping with the challenges of trying to implement change involved compromise and dialogue and helped people hone their communication skills. Working in teams and on projects often gave people support to help them engage in patterns of thought conducive to learning. However, both for individuals and companies there was also the need to have time and space to engage in critical thought, self-reflection and personal development, including opportunities for both collaborative and self-directed learning, in order to overcome the possible limitations of a focus just upon improving current processes and practices. There is also a need to consider longer-term issues.

### **The desire for sense-making**

It was noticeable that in both personal and explicit company-linked work activities the search for knowledge was broad, going well beyond just development of technical skills. The search did incorporate aspects of technical know-how (how to apply technologies), but also involved know-what (where and when technologies and knowledge could be applied), know-who (not just in relation to customers but also an active search for people who would be valuable as members of a personal network), and know-why (a fuller understanding of phenomena and processes, including in some cases a deeper scientific understanding). This desire for sense-making could be driven by one, or a combination, of **an individual search for understanding, be embedded in occupational identities** (thereby influencing attitudes and behaviour) **or a function of participation in networks with an explicit learning dimension.**

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