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**Designing learning programmes in vocational education and training to
promote transferability**

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1. Introduction

One of the central concerns of vocational education and training (VET) professionals in Europe in the late 1990s has been how to support those undertaking VET programmes such that not only can they perform more effectively in their jobs as they exist today, but also so that they are better equipped to handle changes in what they will be required to do in future. The trend has been towards looking for how to develop flexibility in trainees and workers such that they are able to cope more effectively with change and be more oriented towards what they may be required to do in the future, rather than simply training for existing jobs. An acknowledgment that occupational mobility is becoming more important also places an increasing requirement that curricula should be designed in order to facilitate transferability, such that skills, knowledge and understanding acquired in one context can be applied in other contexts. These requirements remain desirable at present but are not always found in programmes in practice. It is possible to draw on evidence from the UK as to what components programmes designed to encourage transferability might have. Note although the evidence is principally drawn from UK sources, where research and ideas from other social scientists have been particularly influential to debates about policy and practice in this country they too have been included.

2. Context

The significance of key skills (or key qualifications) in vocational education and training and at work is now widely recognised. However, when, where and how such core skills should be developed has been a matter of considerable debate. In England and Wales, for example, the degree of emphasis given to core skills development has varied greatly over the past fifteen years. In the early 1980s a major development programme, with national government and matched European funding, was undertaken, focusing on the significance of core skills for work-based learning (Levy 1987). Core skills were an essential element of government training programmes (Evans et al 1987). However, in the middle to late 1980s there was a major shift in direction. The emphasis of government training programmes became more narrowly focused upon the development of occupational skills and, at the same time, the introduction of a system of National Vocational Qualifications (NVQs) heralded a concern with specifying in great detail the criteria associated with occupational competence (Jessup 1991).

Garrett (1990) saw the speed of change in some companies, and the need for them to move towards becoming learning organisations overwhelming competence specifications based on existing work practices. The switch to NVQs also had adverse effects on many learning programmes in vocational areas (Brown et al 1991). The more or less exclusive concern with outcomes led to a neglect of the processes of learning (Brown and Evans 1994), and a fragmentation of learning for individuals as they concentrated upon the achievement of disaggregated elements of competence (Hodkinson and Issitt 1995).

While the deep-seated problems which occur for learning whenever highly detailed criterion-based assessment systems are used (Wolf 1995; Butterfield 1995) were not addressed, there was at least increasing recognition that many NVQ-based learning programmes in practice were limited in the skills they developed in learners (Ashworth and Saxton 1990; Mitchell 1989). For example, Blagg and colleagues (1993) pointed to the gulf between desirable and actual practice in the development of core skills. Earlier work (Brown et al 1991) had shown that it was necessary to ensure that the assessment of outcomes did not drive the whole curriculum process of competence-led programmes. Rather learning processes, outcomes and structures of support for learning should be considered together.

This review of how to define effective learning programmes to promote transferability will cover four major themes. First, there will be a discussion of a recent key strategy paper outlining the need to promote transferability (or adaptability). Second, there will be an examination of the aims of VET programmes as they relate to learning to learn, core skills and the ability to transfer what has been learned. Third, there will be an examination of the critical learning processes and outcomes required to underpin such learning programmes. The fourth theme will address issues concerned with what makes for effective work-based learning.

3. Promotion of transferability

One of the crucial documents from England in relation to the promotion of transferability in learning programmes comes from Tim Oates of the Qualifications and Curriculum Authority (QCA) in a “Key Skills Strategy Paper” (Oates, 1998). In this paper Oates argues that the current specifications of key skills in GNVQ and other programmes have certain benefits, but that they do not engage with the issue of how to design learning programmes such that individuals are able to transfer what they have learned to new contexts. Oates highlights the value of the development in learners of adaptability “the transformation of existing skills and knowledge in order to perform effectively in unfamiliar tasks” (Oates, 1998, p1). Note that what Oates terms adaptability could be broadly regarded as what is termed transferability in the context of European COST debates. The key elements of the Oates argument of relevance to COST discussions are as follows:

- “the promotion of ‘true transfer’ may best be secured by implementing a record of achievement for continuous recording of the way in which a key skill has been deployed and redeployed across an increasing range of contexts.....adaptability - throughout lifelong learning - is best promoted not by a drive towards attaining units, but by continuous review of application of skills in varying contexts. Recording of achievement processes, supported by structured review and tutoring support may be the best vehicle to promote this in all phases. The achievement of vocational and academic qualifications would be an outcome of these processes directed at adaptability, rather than adaptability itself being the focus of ‘hard’ certification” (Oates, 1998, p3).
- “skill transfer can break down unpredictably from person to person.....it seems to be down to the strategies which people use in coping with unfamiliar problems - the skills of transfer,

and not just the possession of transferable skills.....we must recognise that summary assessment and certification of key skills or transferable skills is necessary, but insufficient. This needs to be supplemented by processes which encourage learners to analyse the way in which they are acquiring key skills, in analysing the links between activities they have undertaken in the past and the demands of new activities, and target-setting using frameworks of key/transferable skills. However, it is probable that normal assessment and certification processes are unlikely to sensitively discriminate the 'surface' learning from the 'deep' learning effects. In consequence the argument that urgent attention be paid to the shape of *learning programmes* is a message UK education and training could do well to heed" (Oates, 1998, pp6-7, emphasis in the original).

- the strongest evidence on the value of this approach comes from a project on Cognitive Acceleration in Science Education (CASE) by Adey and Yates (1990). Students taking part in this initiative achieved higher grades not only in science subjects but also in subjects in which there had been no intervention. The curricular approach focused upon the following:
 1. **cognitive conflict** - students had to 'struggle' with intellectually challenging problems. This approach required greater coherence in structuring learning situations, and the challenge had to be such that it could support learner development, without demoralising the learner through constant failure;
 2. **reflection** - learners were explicitly encouraged to think about and reflect upon their own thinking processes;
 3. **bridging** - learners were encouraged to adopt a conscious approach to transfer, in that they were encouraged to apply existing strategies to new tasks or situations;
 4. **reasoning patterns** - these were not taught directly, but teachers who were aware of these were "better equipped to help pupils develop the reasoning patterns for themselves" (Adey and Yates, 1990, p2).

- Oates also highlights how problem-solving approaches in maths have yielded enhanced performance in the application of skills through stimulation of enquiry in unfamiliar settings (Boaler, 1996). Medical training is also quoted as an area which has been effective in securing skill transfer. Although Oates refers to evidence of skill transfer in medical training from the USA and New Zealand (Newble and Clarke, 1986), problem-solving approaches are now almost universal in the early stages of medical training in the UK and these have had marked effects on motivation and resulted in significant reductions in drop-out compared to the more traditional academic approaches previously used. These approaches also utilise a careful sequencing of theory and practice, focus upon learning styles and deliberate use of a wide range of learning styles (Newble and Clarke, 1986).

- Oates goes on to argue that although "the precise details of the models vary.....they share a common theory-driven pedagogy, focusing on principles of fostering autonomous redployment of skills, through learning programmes where difference in context is managed carefully as a key aspect of the learning programme.....the crucial component therefore seems to be the following: pedagogy and programme management driven by a coherent model of skill transfer, not the simple implementation of a list of key skills" (Oates, 1998, p24).

4. The aims of VET programmes as they relate to learning to learn, core skills and the ability to transfer what has been learned

4.1 Learning to learn

The pace of change in many aspects of work and the work environment put a premium upon the ability to learn. Learning to learn is seen as fundamental if workers are to be able to adjust to changes in organisational structures, technological innovation and almost constant change to work processes. One key attribute, associated with initial skills development, which needs to be developed is the ability 'to pick up the threads' in future when skills need updating (Brown et al 1991). That is, young people need to be confident about their ability to learn in future.

There is almost universal recognition then of the value of learners learning how to learn (Novak and Gowin 1984), and this can give a basis for continuing learning in the workplace. As a consequence getting learners to learn how to learn is often given as an aim in programmes of initial vocational education and training. However, this does not ensure the issue will be addressed in practice (Evans et al 1987). This is because of the historic problem associated with many education and training programmes of the tendency to focus those tasks that are easier to teach and/or assess (Sockett 1980). Conversely, the development of more general skills, including learning to learn, which underpin much activity in education, training and employment, can be seen as the responsibility of everyone, and hence in practice of no-one in particular.

'Learning to learn' can be linked to the inculcation of habits such as systematic observation, analysis and a questioning attitude (Annett and Sparrow 1985). This it is important especially if learners are to take advantage of opportunities for learning outside formal education and training settings. This links to the need not only to embed the development of learning strategies within an occupational context (Soden 1993), but that the application of learning strategies should also be contextualised. The ability and willingness to learn are fundamental to the development of a broad occupational competence, which includes a future-orientation as well as a concern for current performance. This means that it is essential that programmes to develop such competence address the need, if appropriate, to remediate the learning to learn skills of learners.

For a learning programme to be effective, individuals on the programme have to be or become effective learners. This may seem obvious, but many education and training programmes do not address this issue. Those involved in delivering an education and training programme may feel that learners already possess effective learning strategies, or even if they are aware of deficiencies may feel that the development of learners in this direction is not their responsibility: 'somebody else should already have done this'. However, this misses the point: that, without remediation and development of effective approaches to learning in those without them, these individuals are unlikely to be successful on their current programme.

4.2 Key skills

It may be useful to make a distinction between key or transferable skills (knowledge and skills which can be applied in a variety of contexts) and skills which enable transfer, which focus upon

the ability to apply those skills in new contexts (Levy 1987). Transferability depends to some extent upon both, but given the extent to which great attention has been given to key (or core) skills this paper will concentrate mainly upon the latter. Also the value of the development of core skills is now widely acknowledged and an essential task of further education and training is to incorporate these broad skills into learning programmes, particularly those aimed at significant numbers of 16-19 year olds (Brown et al 1991). Besides paying attention to the principle of core skills development, it is necessary that this is supported in practice with a core entitlement covering the range and quality of learning opportunities available for individuals to develop their core skills (FEU 1989). Opportunities for the promotion and development of certain general and personal qualities therefore need to be considered in the design of all learning programmes.

The emphasis upon the importance of core skills development is not an argument for the decontextualised teaching and learning of these skills (Barrow 1991), nor for neglect of occupationally specific skills. The key point is that both more specific occupational skills and general core skills can be developed **at the same time**. Indeed integrating the two can be a powerful learning tool (Brown 1988). The assessment of key skills in practice though is sometimes problematic (Wolf 1991) and core/key skills specifications may not get to grips with promoting the ability to transfer (Blagg et al 1993, Oates, 1998). Hence attention may need to be directed more towards the process skills which underpin the ability to transfer. It is therefore important to get both learners and those supporting learners thinking and reflecting upon the core skills development of learners. The line of this argument is that if there are core/key skills, which underpin effective performance at work, then a crucial aid to the development of these skills is that learners become aware of their significance and how they are being used (Levy 1987).

4.3 Ability to transfer

Because many jobs are becoming more complex through task integration, increasing demands are being made upon learners to extend their knowledge base. This in turn puts a premium upon the ability to transfer knowledge and skills to different situations (not least so as to reduce the learning time). Research highlights the importance of learners developing mental maps (Soden 1993), so as to be able to organise what they have learned, with the increased possibility that they could then apply this elsewhere.

Transfer though tends to be highly specific and it needs to be **guided**: it rarely occurs spontaneously. However, Perkins and Salomon (1989), in their review of research on transfer, argue transfer is possible, depending upon how knowledge and skills have been learned and how the individual deals with that knowledge in different contexts: "general skills and bits of knowledge taught within a specific context can become transferable" (Perkins and Salomon 1989, p. 22). Hence two conditions are generally required for transfer to take place: context-specific knowledge and general skills have to be brought together and the approach to learning needs actively to seek ways to encourage transfer.

If one intention of a learning programme is to help learners develop the ability to transfer skills, knowledge and understanding, then learning contexts are required which draw attention to the significance of skill transfer. For example, this could involve actively helping people to look for

opportunities to transfer skills, knowledge and experience and giving them opportunities to practise making successful transfers (Blagg et al 1992). Exposure to a **range** of contexts then can be valuable both for the way it can enhance and lead to a more complete ownership of a skill (Hayes et al 1983) and because it allows learners to make connections (and think about transfer) between contexts (FEU 1984).

Pea (1987) argues that it is necessary to promote a transfer culture, and this would include organising an affective climate directed at transfer. Hence attempts should be made to make transfer strongly linked to learner motivation and commitment. The whole thrust of this approach then is that learners in particular, but also trainers and tutors, are encouraged to analyse contexts for the possibility of skill transfer. Those supporting learners, particularly in the workplace, have to want to support skill transfer and there is evidence that this condition was often not met in the past (FEU 1985).

Hayes (1992) highlights the potential for simulations or extended project work to integrate a number of strands of learning and to seek to promote the ability to transfer from that base. The requirement that learners integrate a broad range of experiences, besides having the capacity to develop the ability to transfer, can itself also help in the development of learners' critical thinking and conceptual skills (Winter et al 1981). This does though depend upon learners being given opportunities for reflection so as to broaden the generality of skills and knowledge learned (Hammond and Collins, 1991).

5. Critical learning processes and outcomes

5.1 Reflection

There is a need to create and sustain a culture within organisations which values learning and development, and reflection can be an important process to help achieve this (Brown and Evans 1994). Any individuals with an ability to transfer what they have learned between contexts will need to be reflective both of their own practice and their own learning. The value of encouraging learners to reflect upon their own learning to try to get beyond "surface level knowledge" (Whitehead 1929) has long been recognised. In particular, attempts should be made to support reflection upon practice: that is, set up a spiral where what is **learned** from reflection on practice can inform action, thereby leading to further learning and so on (Winter 1991). While the need for any learning programme to seek to develop a reflexiveness among learners should be readily apparent, there is an additional dimension in that the learning programme should be designed so that it encourages a reflexiveness about learning among those delivering the programme (Boud et al 1991).

An emphasis on reflection can also act to draw attention away from concerns with the acquisition of a fixed body of knowledge or a set of immutable competences: practice itself should always be **developing**. Hence it will be necessary for individuals to be able to continue to build and refine their own base of knowledge and understanding through reflection on practice, building a spiral of action and appreciation, leading to reflection-in-action (Schön 1983). Critical reflection on experience then is seen as a motor for learning at work (Kolb 1984, Schön 1987).

The staged model of skill acquisition of Dreyfus and Dreyfus (1980) identifies the key to successful progression through to the expert stage as the processes of review and critical reflection. Critical reflection then is widely recognised as pivotal (Hammond and Collins 1991; Tomlinson and Kilner 1991) to the development of expertise. However, there may also be significant gains to be had by helping low achievers to become more reflective. This is because an impulsive cognitive style is linked to low academic achievement (Weithorn et al 1984). Impulsivity is linked to poorly developed search processes when thinking about problems (Bornas and Servera 1992), as a more fully developed thinking process is not utilised. Hence there is likely to be value in not just getting learners to be more reflective per se, but also, if necessary, in paying attention to the development of more elaborated thinking processes.

5.2 Development of thinking skills

Just as policy-makers have been acknowledging the importance of developing in learners learning to learn skills, so increasing interest has been expressed about thinking and problem solving skills development. Blagg et al (1993) conclude from a fairly comprehensive review of the evidence that enhancing thinking skills can have positive transfer effects. One highly influential text (Collins et al 1989) has put forward the notion of a cognitive apprenticeship, where explicit attention is given to the development of cognitive skills. Emphasis is given to modelling approaches to thinking when tackling problems within a domain, through demonstrations, coupled with coaching, offering hints and regular feedback when learners tackle problems themselves.

Collins et al (1989) also highlight the importance of learners making their thinking processes explicit, including through the use of articulation, whereby learners articulate the knowledge, reasoning or problem solving processes they are using. The sharing of ideas about thinking processes can be a valuable means of learning for learner and coach (Brown et al 1994). However, such sharing can also be valuable in group settings, where learners can access (develop, organise and become aware of) their own and others' knowledge and approaches to problems (Prawat 1989).

Soden (1993) argues that there is particular value in teaching and making explicit the thinking that occurs in solving problems in occupational contexts, as "good problem solvers have internal representations of fundamental principles relevant to their occupational area and these representations are connected to each other and to broader relevant knowledge in ways which facilitate application to problems" (Soden 1993, p 12).

Rissland (1985) believes it is therefore essential for tutors to create a framework that can help learners organise their learning in the domain in which they are working. Learners need to develop schemas to organise what they are learning, particularly if training is exploration-based, not least in order to be able to transfer what they have learned (Hesketh et al 1989). One important aim then for developing expertise should be to get learners to build integrated knowledge representations (Landa 1984). Teaching should then "have a dual focus - the development of the thinking skills as well as the achievement of the targeted competence" (Soden 1993, p 3).

Soden (1993) also signals the usefulness of getting students to engage in concept mapping. This is compatible with earlier research (Schmeck 1988) showing that those with a deep learning style were likely to organise ideas into networks, which linked concepts. Soden (1993) was involved in a project to get tutors to teach thinking skills to groups of learners taking vocational modules in Scottish programmes of initial vocational education and training. The work demonstrated the potential of the approach and that learners' problem solving performance could be enhanced. However, there are a number of issues, which would be likely to act as barriers to greater take-up and usage of the approach:

- current assessment processes (and administrative requirements) favouring assessment of particular outcomes (or elements) may be a disincentive for learners to attempt to **integrate** all the underlying knowledge
- the approach would be very much more effective if taught across a whole programme rather than just parts of it
- perceptions of colleagues and senior staff that they [tutors] were "wasting time when they were helping learners to practise thinking skills rather than 'practical' skills, [even though] this perception was not supported by the project data" (Soden 1993, p 43)
- the method works best when extensive use is made of small group discussions and individual tutor-learner dialogues: it could be jeopardised if a tutor has to work with increasingly large groups
- whether the development of problem solving skills is valued.

Learners, therefore, need not just to learn efficient mental processes, but also need to learn when and how to use them in practice. There is, therefore, an emerging consensus on the value of teaching thinking skills to aid problem solving performance in particular contexts. This teaching though should be embedded: that is, directly linked to solving problems that occur in a particular occupational context. Learners should also be encouraged to articulate their thinking processes and be given opportunities to practise using and reflecting upon the relational networks they are developing.

5.3 Development of learner independence

What the above examples reinforce is that while greater learner independence might be increasingly required as an outcome of programmes designed to promote transferability (BT 1993), it may be necessary to pay attention to the development of learners' thinking and learning skills if they are to become independent learners. Given this proviso, however, great benefit can be gained from the learner being more in control of her or his own learning (Long 1990; Hammond and Collins 1991).

One study of Training for Skill Ownership (Hayes et al 1983) in England and Wales advocated setting up learning programmes, which made maximum use of trainees learning how to 'find out'. They highlighted the need for skill ownership to be re-oriented from the organisation to individuals. They were looking to develop learners' independence and autonomy. These ideas were picked up in the YTS (Youth Training Scheme) Core Skills Project which, through the development of support materials in the form of work-based projects, sought to support learners in playing a critical role in their own (self) development (Evans et al 1987).

Companies too have been paying attention to the need to develop learner independence within programmes of work-based learning. One role for trainers is to ensure there are opportunities for reflection within such programmes so that individuals become more effective at acquiring methods of self-learning and techniques for individual development (Infelise 1994).

5.4 Teamwork and collaborative learning

The devolution of supervisory responsibilities to teams of operators changes not only the skills required of operators but also the way in which they are required to work together (Rothwell 1993). Similarly changing skill mixes and the development of multi-skilled or interdisciplinary teams may require skilled workers to work more intensively with others (BT 1993). Hence being able to operate as a member of a team is becoming increasingly important at work.

'Working with others' is one strand of personal skills in the initial vocational education and training GNVQ framework in England and Wales. However, this strand is at present often downplayed in practice. There would appear to be two reasons for this. First, some practitioners argued that the assessment loading in GNVQ was so heavy, that it was understandable that characteristics that were perceived as 'desirable but not essential' would be squeezed (Brown and Germon 1993). Second, because individual assessments have to be made (and have been the dominant mode in educational assessment for so long), too many group activities may be perceived as unlikely to provide sufficient evidence of the competence of individuals.

This is doubly unfortunate, since not only is the ability to work in teams consistently rated as a most valuable attribute (Bradshaw 1985), particularly by employers (BT 1993), but the support of others can frequently be decisive in the learning of individuals. Infelise (1994) highlights how large companies in France, Germany, Britain and Italy make use of group-based project work, action learning and learning while working in organised work-based learning programmes.

There are increasing examples of where, because learners were working in teams at the workplace, these teams became a focus of support for learning (Infelise 1994; Dankbaar 1995). Knasel and Meed (1994) suggest the value of supportive teams in their support and encouragement of learners relates to the ways:

- they provide opportunities for people to share their skills and experience.;
- they provide a forum for exchanging information and generating ideas;
- within a supportive team people can more readily give each other advice, guidance and feedback in an unthreatening manner;
- above all a team - with its defined membership, shared sense of purpose, consciousness of being a group and interdependence - can offer the kind of enjoyable, rewarding environment in which learning is more likely to happen" (p 45).

The extent to which this is feasible though depends either on how work is structured at the workplace (Pettigrew et al 1990; Keep and Mayhew 1994) or upon a readiness to set up activities for learners to learn and work, **as a group**. Encouragement of co-operative learning can be seen as

an important strategy for tutors to adopt, and it is important that learners should learn to value collaborative learning and working relationships and recognise the value of the experience of others.

Resnick (1987) argues that group settings enable learners to talk about their thinking processes in a socially acceptable way, and elevates thinking to an observable status (Glaser 1991). Sanches (1992) endorses this by showing that group-based problem solving can help learners develop reflective thinking skills and their capacity for self-regulation, as well as increasing the likelihood that they will transfer what they have learned.

The value of group projects in developing the skills of working with others has been demonstrated in a number of contexts (FEU 1985; Boud et al 1991), but the problem is that time for group reflection may be seen as 'soft' and be sacrificed or severely curtailed in response to more pressing demands. Soden (1993) highlights that the most effective way of "remedying thinking errors is to discuss them with someone else" (p 18). Miyake (1986) also showed that during collaborative problem solving individuals were more likely to monitor their own thinking processes. Working with others within learning programmes is particularly important for those who may be working largely on their own at work or in work placements. Opportunities for working with others should be built into all learning programmes but, where relatively little working and learning with others occurs at work, it may be that the use of action plans and learning contracts can give particular emphasis to supporting opportunities for working with others in other contexts.

A further advantage of collaborative learning is that it might enable those with limited views of their own likely achievement to tackle more ambitious activities and set more challenging goals than they are likely to do if working on their own (Bandura 1986). Vygotsky (1978) signals the advantage of collaborative learning for the way those working with more capable peers eventually internalise approaches to problem-solving, which were initially beyond them when working on their own. The social context created by a co-operative approach can also enhance the motivation and commitment of the learners (Slavin 1983). Blagg et al (1994) see guided groupwork as invaluable not only to develop teamwork skills, but also as: "an important means of extending learning and understanding. Effective groups providing a 'cognitive scaffold' for others to climb and build on. Ideas, tactics and solutions, evolve in an iterative way enabling individuals to see possibilities which would otherwise have been unavailable to them" (p 9). In this way collaborative learning can not only help individuals to transfer their skills, knowledge and understanding between contexts, but also expose individuals to different strategies for making these connections.

5.5 Learning and assessment processes being linked

One major problem with the highly detailed specification of occupationally-specific knowledge and skills, and the need for assessment processes to ensure performance criteria are met, is that the whole assessment process becomes focused upon the most visible aspects of occupational practice. So in the system of NVQs in England and Wales, there may be "the assumption that the occupational standards (the elements and the performance criteria) were sufficient in themselves to carry the full meaning of competence" (Mitchell 1989, p1). This may encourage users not to look

beyond the standards in constructing a learning programme. For this reason Eraut (1993) argues for the use of the term 'capability', one dimension of which would be to provide a basis for developing future performance. BT (1993) make a similar point, defining capability as "the outlook, understanding and way of working that promotes innovation and adaptability" (p 8).

The above is not an argument against the specification of outcomes per se, but rather for the need to focus upon ways of outlining learning outcomes and processes in broad terms so as to avoid the problems generated in practice by highly detailed criterion-based assessment systems (Butterfield 1995; Wolf 1995). One way to achieve synergy between learning and assessment to achieve the goal of promoting a deep approach to learning could involve an attempt to reconcile the traditions of knowledge-based and competence-based approaches: particularly, in the way reflective processes could be encouraged (Brown and Evans 1994).

It is important to try to develop shared understandings of assessment processes (Brown et al 1991), and not to assume mistakenly that criterion-referencing removes this requirement (Wolf 1995). Indeed it is necessary to recognise that the development of a working consensus about assessment processes is itself a process which takes time, resources and commitment to achieve (Brown et al 1991). Wolf (1995) talks of developing a 'community of judgement' among those making such assessments.

Assessment should support the learning process. Over-complex assessment processes, such as those associated with NVQs in England and Wales, may actually prove to be a hindrance (Brown et al 1991). Also there is increasing recognition of the need to develop a more equitable balance in focus upon process and outcomes (Hodkinson 1992; Brown and Evans 1994). Knasel and Meed (1994) report that many practitioners feel that emphasis on assessment in national development work in England and Wales has "meant that in a number of cases too little attention has been given to the question of how to promote effective learning" (p ii). Similarly in the many cases where workplace assessors also act as workplace coaches, there was a feeling that "it may well be that professional development that they take part in will stress assessment rather than learning and will give too little priority to the inter-relationship between the two" (ibid, p ii).

Indeed it is important to recognise assessment can have explicit pedagogic functions. Formative assessment can be particularly valuable in providing feedback (William and Black 1995), which can allow for reinforcement, refocusing or redirection of learning. This points to the need to consider learning and assessment **together** when designing programmes to promote transferability.

Hence what is now required are more imaginative ways of **integrating** knowledge acquisition, problem-solving and key skills development in work-related activities, which are relevant to the workplace and meaningful for the learner (Achtenhagen 1994). Achtenhagen (1994) and Hayes (1992) argue strongly that extended 'company' simulations can deliver such integration. They argue that such simulations have the potential for helping learners engage in a broader 'systems thinking'. In this respect, there would appear to be some strong alignments with the development of problem-based learning (Boud and Feletti 1991; Oates, 1998): it is learner-centred with the integration of subjects and skills into thematic blocks, coupled with use of learning oriented work in small groups

and self-directed learning. Such methods would also be compatible with assessment processes that tested knowledge generated from an analysis of practice (Atkins et al 1993).

This approach would accord with the other aims espoused in this paper: the need for learners to develop thinking skills, core skills, the ability to transfer and so on as a basis for high level performance in future as well as at present. Such an approach, however, needs to be aligned with practical and active work-based learning, concerned with current and future performance in an holistic approach to the development of capability and expertise. This in turn will require a more integrated and imaginative concern for learning and assessment, drawing on, for example, group project work and problem-based learning and assessment.

6. Effective work-based learning

6.1 Context of learning

In previous sections the aims and critical learning processes and outcomes of learning programmes to develop transferability have been outlined. However, such programmes can take place in a variety of contexts, so it is worth examining what type and combinations of learning contexts contribute to making work-based learning effective. One key decision will be the location of and balance between development of more specialised expertise and broader vocationally oriented knowledge. The diversity both of employers and of facilities of off-the-job learning providers make it unwise to lay down any general rule. For example, HMI (1990) show that work-based learning in realistic settings in college can be valuable, and Frietman (1990) shows that either simulation or authentic learning can be effective, and which is more appropriate depends on a variety of circumstances.

Nieuwenhuis (1991) goes further to argue that there is not a single 'best' context, because effective training can make use of a **variety** of contexts. Rather it may be more appropriate to audit the learning opportunities available and the advantages and disadvantages associated with particular combinations of education, training, employment and community contexts. Knasel and Meed (1994) argue along similar lines that guidance should be given to practitioners which allows them "to make informed decisions about the relative strengths and limitations of off-the-job, near-the-job and on-the-job experiences in relation to specific areas of learning and aspects of the learning process" (p iii). It is also important to monitor what happens in practice, as "work-based learning has the capacity to deliver an exceptionally challenging and rewarding learning environment. However, it can also produce sterility, where challenges are few and a series of mundane experiences lead to little learning" (Brown 1992, p 134).

6.2 Quality of learning environments in companies

Onstenk (1994) points to the need for workplaces to offer 'strong learning environments', where it is possible for learners to apply their developing skills, knowledge and understanding in different contexts. There are some obvious difficulties for some small companies in providing the full range of learning opportunities required for the development of a broad occupational competence. Training practitioners in one study in England strongly believed that organisational culture itself

could be influential, whereby "the *wrong* organisational culture would significantly inhibit effective learning" (Knasel and Meed 1994, p 17, original emphasis). In contrast, in an organisation with a long-standing commitment to learning, then it may appear natural that workers learn with the company (Brown and Evans 1994). Pettigrew et al (1988) saw the existence of receptive or non-receptive training contexts as influential upon the whole approach companies adopted to the development and management of their human resources.

While some small companies are reluctant to get involved in training and development (Keep and Mayhew 1994), other relatively small or medium-sized enterprises are highly innovative, and particularly if linked into 'multi-firm networking processes' (Rothwell 1993), they can offer very rich learning environments. In such circumstances, work itself (and the survival of the company) is concerned "with extending levels of organisational adaptability and flexibility and with developing new areas of knowledge and technological competence" (Rhodes and Wield 1994, p168). The richness of the work/learning environment is such that knowledge and expertise rapidly develop through work, which is itself taking place in different contexts (and possibly companies). In such circumstances great emphasis is given to possession of: "a broad mix of skills is required to achieve viable levels of flexibility in the development and delivery of products and services, and to sustain viable inter-firm networks" (ibid, p 169).

The problem is that as Keep and Mayhew (1994) argue in many areas of the UK employers have a low demand for skills, and as a result opportunities for the development of transferability may also be limited. So attention needs to be focused not only upon the possibilities for learning associated with particular activities or jobs, but also upon the extent to which the organisation itself demonstrates a commitment to learning through its culture (Brown and Evans 1994; Pettigrew et al 1990).

6.3 Potential of work-based learning

Commentary in previous sections pointed to the potential of work-based projects as a means of enhancing work-based learning, integrating learning from different contexts and encouraging learner independence. This is not to argue that such a project-focus is always necessary, but without it the work and/or training had to be already exceptionally rich in opportunities for learning and development. Training or learning-oriented organisations may not need a framework of explicit work-based projects, but those without such an orientation may find such a framework useful in helping them focus more explicitly on learning. In the UK one example of the development of such a framework was the YTS Core Skills Project, which emphasised the design and the development of work-based projects (Evans et al 1987).

One problem associated with proposing the use of work-based projects is that some people have a fixed idea about what a project looks like (whether it is a 'typical' business studies market research project or production of a 'typical' engineering craft product). However, a group project might be a review of quality control procedures of a service organisation (European Community IFAPLAN 1986). Indeed the complexity of production processes and the intensity of work pressure on employees might mean that projects could address a whole range of issues and activities, which

while desirable and of direct interest to the company are not carried through because of more immediate pressures.

The purposes of work-based projects need to be clearly thought through (Evans et al 1987). An example of a project with a clearly thought out purpose could be where there is an intention to get learners to **reflect** on their work-based learning to try and achieve a different (and more 'expert') way of conceiving problems at work (Eteläpelto 1994). An alternative to using work-based projects might be to use learning plans, contracts and reviews as a means of getting reflection upon experiences and learning at the workplace (Marshall et al 1992). Knasel et al (1994) show that similar ends can be achieved through the use of action planning, learning logs and reviews or through using a critical incidents approach.

7. Conclusions

One key message for those charged with designing effective learning programmes for the development of transferability is that the prime focus of the inter-relationship between education, training and employment needs to be upon learning. Particular attention should be given to ways of outlining learning outcomes and processes in broad terms, so as to avoid the pitfalls associated with highly detailed criterion-based assessment systems. A focus upon learning immediately draws attention to the need to ensure learners possess or develop effective learning strategies. In particular, it will be important to ensure learners are given opportunities to improve learning to learn skills and that a sufficient range and quality of learning opportunities are available for individuals to develop their key skills.

In particular, if the intention of a learning programme is to help learners develop the ability to transfer skills, knowledge and understanding, then learning contexts are required which draw attention to the significance of skill transfer. Processes of review and critical reflection are pivotal for this. Organised reflection on what has been learned and what needs to be learned in future can act as a bridge between working and learning, and as a bridge between the skills that are currently required and those that may be needed in future. Such reflective processes can also link into the development of more elaborated thinking processes that underpin the ability to transfer knowledge, skills and understanding. More generally, learners should be encouraged to make their thinking approaches explicit, through discussion with tutors, coaches or peers, of their approach to problems in their occupational area and of the networks or schemas they are developing to understand concepts and relationships in their area as a whole. By the same token it could be useful for tutors to teach thinking skills and strategies as an aid to problem-solving in occupational contexts.

The development of learner independence too is an important goal as learners need to take increasing responsibility for their own continuing learning possibly across a range of occupational settings. Similarly being able to learn and work in teams has become more significant in a variety of contexts and learning programmes should provide opportunities to develop these skills. The importance of the development of a range of process skills makes it vital that assessment should support the learning process, and formative assessment can be particularly valuable in this respect. Hence learning and assessment should be considered together when designing learning programmes to develop transferability.

It might be thought that the attention upon the process skills underpinning the ability to be effective in different contexts might result in the development of a substantive occupational knowledge base being downplayed. However, this is not the case. Rather the development of process skills ideally should be embedded in appropriate occupational contexts. Further, the development of a substantive knowledge base is important because it is central to the development of domain-specific expertise and because it forms a platform for continuing learning in the future. Indeed it should be remembered that the ability to master a substantive knowledge base is itself a process skill, which can be valuable in a variety of learning and working contexts.

The design of effective learning programmes to develop transferability needs to be able to draw upon a variety of learning contexts, and designers need to be aware of the strengths and weaknesses associated with particular combinations of education, training and employment contexts. The quality of learning environments in companies can be particularly variable, and organisational cultures can either inhibit or promote effective learning. Similarly, patterns of work may be such that expertise can develop through a productive combination of working and learning. In order to make the best use of less favourable learning environments at work, it may be useful to use work-based projects, learning contracts and action planning in order to enhance and enrich work-based learning and to make it applicable to contexts beyond the immediate work environment.

Overall then, this paper has offered a number of examples, drawn mainly but not exclusively from the UK, of factors that those designing learning programmes to promote transferability might like to consider.

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