



INSTITUTE FOR EMPLOYMENT RESEARCH

***Development of key skills across contexts  
and over time***

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## **Development of key skills across contexts and over time**

### **Introduction**

Answers to the question 'what are the key skills of higher education' are likely to differ according to who is asked the question and the social context. I will argue that as (higher) education is a developmental social process, then 'key skills' should also be framed as a developmental process. Additionally, because the meaning of 'key skills in HE' is socially contested, then there are particular tensions for students in negotiating transitions between contexts where different meanings may be held. I have previously highlighted the tension between the key skills required to be successful to gain entry to higher education and the key skills required to be successful in the first year(s) of higher education (Boffy et al 1993; Brown 1994). So in this paper I will examine the tensions between the key skills required to complete (particular programmes of study in) higher education successfully and the key skills required to be a successful graduate (in the eyes of potential and/or actual employers). Introducing a time perspective draws attention to another fundamental characteristic of key skills: they should be capable of being applied in different contexts.

So far I have not identified the key skills of HE, because I believe the search for precise key skills specifications can sometimes obscure the importance of process in key skills development, and genuine individual 'ownership' of key skills only comes through the development and application of these skills across contexts and over time. So rather than giving my specification of key skills, I am content to work with the (competing) specifications of others, so as to illustrate the importance of a process dimension to the debate. Hence I will work with the key skills specifications of academics, employers and NCVQ.

### **Tension between the key skills required to complete particular programmes of study in higher education and the key skills required to be a successful graduate**

University of Warwick academics surveyed as part of the HEQC Graduatness Project emphasised that the attributes of graduates in German, Biological Sciences and Sociology could be "grouped into three clusters of cognate skills and abilities: subject knowledge and methods; academic skills; transferable skills...[and] each department argued strongly that subject knowledge and methods were pre-eminent; that these formed the core which underpins the teaching and assessment of the other attributes" (University of Warwick, 1997, p16). They also believed that graduates possessed common oral and written communication skills, IT skills (though in varying degrees), information-handling skills; and (subject specific) research skills.

These skills align well with some of the requirements of graduates highlighted by employers in a Quality in Higher Education seminar: intellectual ability; listening skills; explaining skills; oral and written communication skills; analytic skills; and critical thinking skills (QHE 1993). However, employers also highlighted other skills graduate employees should have: initiative; creativity; innovation; interpersonal skills; team work; problem-solving skills and the ability to make good judgements. Now individuals may possess the first five skills and qualities to a greater or lesser degree, but they are not necessarily developed per se within particular programmes of study. The final two requirements, problem-solving skills and the ability to make good judgements, may have different meanings in employment and within particular programmes of study in HE.

I am not arguing that radical changes need necessarily be made to particular programmes of study, rather I will argue that a more holistic approach to undergraduate development has considerable value. Additionally, as with the transition into HE (Brown 1994), a framework that encourages the development of skills and abilities of individuals can itself be a useful tool in aiding that development. So, bearing this in mind, can the key skills identified by NCVQ be of value in promoting the development of key skills in HE.

### **Learning to learn**

There is a certain irony in that the key skill of learning how to learn, which is fundamental to so much activity in education, training and employment (Smith et al 1990), is often given relatively little attention in practice. Soden (1993) argues there is considerable value in helping learners develop and apply learning strategies in particular contexts, with tutors demonstrating “what [learning] strategies can be used, and how they can be applied, and when and why they are helpful” (Paris 1988, p314).

Concerns with ‘learning to learn’ neatly illustrate the value of successful performance over time and across contexts. That students have had their attention drawn to the need to reflect upon and ‘improve their own learning and performance’ (NCVQ key skill) in previous programmes may be a useful starting point. However, learning strategies have to continue to be applied in more complex and challenging contexts. Students need to develop learning strategies that help them with academic skills associated with analysis, critical thinking, presentation of arguments, mastery of an increasingly complex knowledge base and so on. They could also reflect upon, develop and ultimately ‘own’ learning strategies that help them take initiative, show creativity, innovate, be an effective team member and so on. Finally, a vital aspect in the development of problem-solving and judgmental skills is learning to develop strategies which include making connections across different contexts. In this sense then a developmental approach towards learning to learn should span all aspects of the student experience of higher education.

### **Information technology skills**

IT skills figure prominently in most key skills specifications. They act as an underpinning to individual effectiveness in many aspects of learning, and as such fundamental IT skills are increasingly developed prior to entry to HE, and/or individuals can develop these skills within workshop provision and through following self-study programmes. The application and use of particular IT programs, such as spreadsheets, data analysis, simulations and so on, may be fundamental to different programmes of study. So this, coupled with a general curriculum entitlement for individuals to participate in a range of IT learning opportunities, should open up opportunities for skill development in this area.

### **The application of number**

Similar arguments pertain to the development and application of number skills. The basics should be developed prior to entry but, if necessary, remedial support should be available

early within a student career in HE. Specialist applications may be available within particular programmes of study, and in such circumstances these skills should be developed at the same time as more specific subject or occupational skills. Learning to apply number skills in such situations can be easier for those who may have struggled with earlier decontextualised teaching and learning of these skills.

### **Communication skills**

Communication skills are classic transferable skills that may be applied in a variety of contexts. However, the ability to communicate effectively does not always transfer across contexts. Hence the effective use of oral and written communication skills do not always transfer between settings: for example, changes in relation to the use of different cognitive or group process skills, the nature of the audience and so on, may radically affect how well an individual performs. So this is another area where individuals need to monitor their own performance in a range of different settings and contexts, some of which fall outside formal programmes of study, adopting a holistic approach to these skills, recognising that their development and application can take place in a variety of contexts.

### **Teamwork and collaborative learning**

Changes to organisational structures and the development of multi-skilled teams mean employees often have to work intensively with others (Jallade 1989; Dankbaar 1995), and employers have increasingly stressed the need for graduates to work effectively in teams (BT 1993; QHE 1993). Now within schools, colleges and universities there is a tradition of encouragement of working as a member of team in extra-curricular activities or in 'special' curricular activities. Individuals also may have considerable experience of working in teams outside programmes of study. However, within education programmes 'working with others' is often downplayed in practice. It may be seen as a 'desirable but not essential' component, which is squeezed in the face of more pressing demands (Brown and German 1993). Additionally, 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 providing insufficient evidence of the achievement of individuals.

So the ability to work as a member of team, including being able to fulfil a variety of roles within a team depending upon the circumstances, is the types of generic capability that should be developed within a holistic approach to graduateness. Institutions should ensure that all graduates have developed these capabilities, and the opportunities for learning in this area may come from involvement in activities within and outside particular programmes of study.

However, the ability to work collaboratively should not be just valued for its future utility in employment, because it can also be central to the learning of individuals in their current programme of study. The ability to learn collaboratively is a valuable component of individual learning strategies, and its value has been shown in a variety of contexts in post-compulsory education and training (see, for example, California Community Colleges Project Team 1989; Hayes 1989; Infelise 1994; Dankbaar 1995).

Encouragement of co-operative learning by tutors can be important (van Ments 1990), as 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 this elevates thinking to an observable status (Glaser 1991). Sanches (1992) shows 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. Mandl and colleagues (1994) similarly show how the use of 'thinking aloud' protocols to explain actions in group-based simulations give a basis for collective review and identification of successes and failure in their utilisation of knowledge.

The value of group projects in developing the skills of working with others has been demonstrated in a number of contexts (Boud et al 1991), and Soden (1993) highlights that the most effective way of "remedying thinking errors is to discuss them with someone else" (p18). Miyake (1986) also showed that during collaborative problem solving individuals were more likely to monitor their own thinking processes. Opportunities for working with others should be built into all learning programmes but, where relatively little working with others occurs in some programmes of study, 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 can encourage students to tackle more ambitious activities 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 an: "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" (p9).

### **High level intellectual skills**

So far it looks as though adapting five of the NCVQ key skills would represent an acceptable starting point, provided opportunities are given to apply and develop these skills across contexts and over time. The sixth NCVQ key skill area 'problem-solving' is more all encompassing and links to the need within HE to develop high-level intellectual skills. Employers value the intellectual ability of graduates and they may identify particular types of skills they appreciate (QHE 1993). Alternatively they may point to the complexity of their skill requirements and the need for skill integration whereby technical, conceptual and personal skills are inextricably linked (BT 1993) to make clear they need high level intellectual skills in their graduate recruits, as well as a range of other capabilities.

Now these types of skills are precisely those skills which staff associated with particular programmes of study are seeking to help students develop. These higher order skills, termed 'broad skills' by Wolf and Silver (1995), can be conceptualised as applying to a whole range

of contexts, but are always learned and developed in particular contexts, and can only be exercised effectively in those contexts if they are allied to occupational or subject-specific knowledge and skills (Wolf and Silver 1995).

The importance of the development of high level intellectual skills is therefore dependent upon depth of study of particular subject(s)/area(s), and should not be taken as an argument for the decontextualised teaching and learning of these skills (Barrow 1991). Mastery of a subject will necessarily mean that an individual possesses some high level intellectual skills. However, two significant questions remain. One is whether, within the subject or area, giving explicit attention to the development of high level intellectual skills itself enhances the development of those skills. The second question is whether the individual can transfer these skills and apply them to other contexts.

### **Support for the development of high level intellectual skills**

The adoption of particular approaches to learning can support the development of high level intellectual skills, and 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: to 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 to develop a reflexivity among learners should be readily apparent, learning programmes should be designed to encourage a reflexivity about learning among those delivering the programme too (Boud et al 1991).

An emphasis on reflection can help learners 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 is then seen as a motor for learning (Kolb 1984, Schön 1987), including in the staged model of skill acquisition of Dreyfus and Dreyfus (1980). Critical reflection is then widely recognised as pivotal (Hammond and Collins 1991; Tomlinson and Kilner 1991) to the development of expertise. One aspect of this reflexivity could focus upon the thinking processes being employed.

There has been increasing interest in thinking and problem-solving skills development. For example, the US Committee on Science, Engineering and Public Policy (1984) drew attention to the increasing need for students to learn the thinking skills to manage information, formulate effective probing questions, solve problems and so on. In Germany too, Achtenhagen (1994) argues that vocational education has to pay attention to the mid-term and long-term development of higher order abilities, such as problem solving.

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. Collins et al (1989) 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, and this approach can be particularly 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).

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, through schemas (Hesketh et al 1989), integrated knowledge representations (Landa 1984) or concept mapping (Kommers et al 1991; Soden (1993). 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. Simons (1990) too points out that the likelihood of future transfer is greatly enhanced if learners have a representation in their minds of how concepts and ideas fit together in a relational network.

Learners need to learn efficient mental processes and 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 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.

### **Are key skills transferred and applied in other contexts**

All the key skills discussed in this paper are transferable and could be applied in a wide variety of contexts. However, transfer is by no means guaranteed, so attention needs to be directed towards facilitating the 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 (through greater breadth rather than greater depth) (Dutch Ministry of Education and Science 1993). 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). 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. 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 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. This could involve actively helping people to look for opportunities to transfer skills, knowledge and experience and giving them opportunities to practice making successful transfers (Blagg et al 1992). Exposure to a **range** of contexts can then 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 it that learners in particular, but also tutors, are encouraged to analyse contexts for the possibility of skill transfer.

Currently, both in the Netherlands and Germany stress is being placed upon 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 (Dutch Ministry of Education and Science, 1993; Schmidt-Hackenberg 1992; Achtenhagen 1994). Hayes (1992) gives examples of this approach being adopted in England and Wales.

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 learner's 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 (Simons 1990).

## **Conclusion**

In conclusion, my argument is that any identification of key skills has to lead on towards a strategy which makes it clear how opportunities will be given such that students can develop these skills over time. Making these skills explicit and encouraging students to recognise, reflect upon, discuss and record their achievements in the development and application of these skills in different contexts is a valuable next stage. One goal is to encourage students to become more aware of learning processes: particularly those of critical reflection, making ways of thinking explicit, application of skills, knowledge and understanding, contextualising learning with practice and so on. Further, if it is accepted that key skills are those skills that can be applied in different contexts, then explicit attention should be given to drawing attention to how these skills can be applied in different contexts. So in addition to a concern with the development of key skills, opportunities should be given for students to apply these skills in different contexts and attention focused upon the process skills underpinning the ability to be effective in different contexts and over time.

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