COSTS AND BENEFITS OF SELF-DIRECTED LEARNING AT WORK: INTERACTION OF SOCIAL INFLUNCES AND INDIVIDUAL COMMITMENT

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1. INTRODUCTION

The whole idea of self-directed learning at work is bound up with a number of paradoxes. Learning itself is both an intensely personal activity and a quintessentially social process. Self-directed learning depends upon individual commitment and the support and encouragement of others. Management sometimes aims to promote self-directed learning at work, while at the same time seeking to control and channel that learning. If learners are given genuine choices, they may opt to be passive learners rather than self-directed learners. It is therefore not easy to decide exactly where the costs and benefits of self-directed learning at work lay.

The benefits for management include not having to pay for possibly more expensive training and having workers with a commitment to their own learning and skill development. The costs for management are that they may feel they lose an element of control and that the workers may take longer to reach appropriate levels of skill and productivity. The balance of costs and benefits for workers depend partly upon the nature of their work, their experience and opportunities for subsequent career progression, and the extent of their commitment to this form of learning. How workers feel about self-directed learning at work are also subject to social influences.

A fuller understanding of the costs and benefits of self-directed learning at work needs to be situated in particular contexts. This paper will therefore focus upon the effect of social influences upon individual commitment to self-directed learning at work. Costs and benefits of this form of learning are partly dependent upon the way particular types of social influence impact upon, and in turn are to some extent shaped by, the commitment individuals display to self-directed learning at work.

I will consider four types of social influence upon individual commitment to self-directed learning at work, looking at the effect of different types of social relations at work. The first may arise from the employment relationship itself, where there is a more or less formal understanding between employer and employee that the individual not only has to learn on the job, but also that how and what is learned will be largely up to the individual. The second is linked to an occupational or professional identity and how the individual responds to ideas of what it means to be (and continue to be) an expert practitioner. The third may come through work-group attachments, where the individual shares her or his own learning with the learning of others: that is, where the learning is still self-directed

but it also has an explicit social purpose. The fourth type is built more directly upon inter-personal relationships, whether the other person is acknowledged as a particular source of knowledge or as an unofficial mentor.

2. THE INFLUENCE OF THE EMPLOYMENT RELATIONSHIP UPON INDIVIDUAL COMMITMENT TO SELF-DIRECTED LEARNING AT WORK

The relative under-development of the UK intermediate skills base has led Soskice (1993) to argue that, in a UK context, it makes more sense for employers to recruit graduates, with generally more highly developed communication skills, willingness to learn, and other 'key qualifications', but without any appropriate specifically vocational training, than to attempt to develop or secure individuals who had been through initial vocational training. The argument is that graduates can then be given specific training and/or develop their skills through on-the-job training or programmes of learning while working. This would fit with the long-standing belief in the value of development of skills through the exercise of responsibility, rather than through an organised preparation for responsibility, and is probably typical of the wider UK labour market. This could be a case of making a virtue of an unwillingness to train. Recent evidence suggests that some employers are reaching a more or less formal understanding with new recruits that the individual not only has to learn on the job, but also that how and what is learned will be largely up to the individual. This approach is, however, not just being adopted by small companies with limited resources (Vickerstaff, 1992), it is being used as an act of policy, clothed in ideas of empowerment and self-directed learning.

A study by Rajan et al. (1997) highlights, in a survey of 950 small and medium-sized companies in central London, that growing companies were likely to be moving towards a performance-driven business culture, with an emphasis upon empowerment, teamwork, lifelong learning and individuals managing their own careers. Graduates were "reckoned to have intellectual and behavioural traits more in tune with the main elements of the new culture" (Rajan et al., 1997, p.13), and as a consequence "the growing companies in our sample have been recruiting a significant number of graduates in recent years in nearly three out of every five companies in our sample, more than 20 per cent of the workforce have graduate qualifications" (Rajan et al., 1997, p.13). The training methods most frequently used with new graduate recruits were learning by doing; coaching by line managers; interacting with suppliers and customers; and through the exercise of significant work responsibilities.

These dominant methods make use of mentoring and experiential learning, but in the main "graduates are thrown in at the deep end from the outset; with much of the training coming through learning by doingExcept in professions like accountancy, chartered surveying and law, the learning that occurs is neither accredited nor examined. Even with external courses, the tendency is to send graduates on ad hoc courses that are short and modular. They address the practical needs of the job rather than the qualifications

aspirations of the individual. Learning through external courses is actively encouraged, so long as most of it is in the individual's own time" (Rajan et al., 1997, p.24).

The central London labour market may be a special case in some respects, but it would appear that at the heart of the employment relationship is a very different conception of the rights and duties of employers and employees, not least in the area of learning and training. Employers are targeting the employment of inexperienced young people (for example, graduates without appropriate specialist knowledge), and relying upon their willingness and commitment to learning (and to working long hours, if necessary) to become effective in their jobs in a relatively short space of time. After a couple of years the employee has built up work-related experience so that he or she is able to apply for jobs with other firms, where previously they would have been considered the applicant insufficiently qualified.

It is almost as if there is a short-term bargain that the employer will give new entrants the opportunity to establish themselves in the particular occupational and/or work environment, but the extent to which you are successful will depend less upon how well trained you are for exercising your role and more upon well you can learn through working. In such circumstances the ability to engage in effective self-directed learning can make a difference between success and failure in the job. Now such a work environment could be perceived as permissive, challenging or exploitative, depending partly upon the extent to which self-directed learning is supported at critical points. The issue of learning and development could be attaching itself to the wage-work nexus traditionally seen at the heart of the employment relationship. However, it is difficult to identify how new sets of relations might develop, not least because some types of learning while working are viewed as 'just part of the job' (Beinart and Smith, 1998).

There are significant issues here around what constitutes learning and how easily it can be differentiated from experience (Coffield, 1997). Within companies too, if they move towards becoming learning organisations and facilitate self-directed learning, they are faced with a challenge of balancing management and freedom in learning: "how can we relax control over the learning process while at the same time channelling the benefits from it?" (Jones and Hendry, 1994, p.160). Fully self-directed learning at work requires individuals not only to learn from work, but also to use their own initiative to find out what they need to know. The learner/worker, however, might still require support. Eraut et al. (1998a) point out that "managers' hopes that employees will be self-directed learners may not be realised if their attitude is perceived as permissive rather than positively supportive" (p. 39).

Companies then have to pay attention to the need to develop learner independence within programmes of work-based learning, including learning while working. 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). Hence in any new form of employment compact the rights and duties of both employees and employers will need to be carefully

considered. However, what is apparent is that the employment relationship can itself be operating as a major influence upon how self-directed learning operates in practice.

3. THE INFLUENCE OF OCCUPATIONAL OR PROFESSIONAL IDENTITY UPON INDIVIDUAL COMMITMENT TO SELF-DIRECTED LEARNING AT WORK

The following example illustrates how individuals are influenced in their approach to self-directed learning by ideas upon developing and maintaining an occupational identity. It is drawn from recent evidence of how knowledge, skills and understanding in employment are developed for radiographers, working as technical specialists in the health sector (Eraut et al., 1998b). Diagnostic radiographers have to "produce a picture fit for the purpose in a reasonable time using a wide range of equipment in a variety of different locations and in different circumstances" (Eraut et al., 1998b, p. 17). For example, they may work in theatres or specialist units as well as in their own department, or they may be working alone overnight. Radiographers also have to accommodate to "local ways of presenting the pictures (common views and angles and reporting procedures) to meet the preferences of different medical staff. They also need to be able to manage patients with different levels of tolerance, comfort and anxiety under varying medical circumstances. They work as part of a team and have to appreciate the different roles and challenges confronting other members of that team. They may be called upon to teach or supervise others. Overall, they need the technical know-how to make things work and get what they want and the personal skills involved in relating to internal and external customers" (Eraut et al., 1998b, p. 18).

The key point about such a detailed delineation of what radiographers do is to emphasise the general point that formal education and training [and certification] contribute to only a small proportion of learning at work (Eraut et al., 1998b). In particular, a developing understanding of situations, colleagues, the work unit and the organisation are examples where learning primarily occurs while working, rather than in a formal setting. Similarly, much learning that occurs at work depends upon utilisation of knowledge resources outside formal education and training settings. Thus radiographers learn from fellow radiographers in their immediate work group, other colleagues, and utilise a "rich variety of professional networks ... largely dependent on personal contacts.... There was also some evidence of "invisible colleges" in the health professions which extended beyond close personal contacts but also depended on occasional meetings for their sustenance" (Eraut et al., 1998b, p. 25).

The challenges inherent in the work itself, including being 'on call' and the need for ongoing mutual consultation with colleagues, stimulate learning while working. This is often reinforced by organisational climates, which acknowledge the value of education and training and which support the existence of professional networks. Support for both formal and informal learning is therefore often quite strong. The richness and variety of learning opportunities does mean that there is a strong expectation, within the community

of radiography practice, that practitioners will continue to learn so as to maintain their occupational identity as a competent practitioner, and further that each individual will take control of how they learn. In respect of how each individual integrates what he or she has learned then the learning is self-directed.

This is in line with the finding of Gear and colleagues (1994) study of informal learning in the professions, which emphasised that most professionals had some idea of the learning outcomes they wanted but followed an emergent strategy which took advantage of learning opportunities as they arose. The essential point to remember here is that learning of new skills and techniques comprises only one aspect of continuing learning and development at work, even if gaining additional specialist qualifications in areas such as radionuclide imaging, mammography, body scanning and medical ultrasound are conventionally seen as central to formal programmes of continuing professional development. The work of a radiographer as a whole, however, encompasses so very much more in terms of experience, learning and development than mastery of particular techniques that to be acknowledged by colleagues and others as an experienced professional, capable of high level performance in a wide variety of settings and contexts, will always carry great weight.

This means it is the judgement of peers, and internalised, but changing, notions of professionalism, that can be seen as a real driving force behind the patterns of self-directed learning of radiographers. Indeed as this has become increasingly recognised so attempts have been made to incorporate at least some of this informal learning within formal practice-based additional qualifications. These seek to engage more fully with a variety of aspects of performance in current and possibly future roles, with an emphasis upon developing a deeper understanding of practice, coupled with a broader programme aimed at facilitating further learning and development. Such formal programmes are therefore explicitly recognising and supporting self-directed learning, and reinforcing the idea that the ability to engage in self-directed learning is a key component of occupational identity.

4. THE INFLUENCE OF AN ATTACHMENT TO THE WORK-GROUP UPON INDIVIDUAL COMMITMENT TO SELF-DIRECTED LEARNING AT WORK

One of the traditional ways of viewing adult learning was that one of its major purposes was to help individuals gain some control over a complex world (Legge, 1982). Such learning could then play a transformative role (Brookfield, 1986) in giving individuals greater potential to shape aspects of their lives. From this perspective the disregard of employees as organisers of their own learning is problematic (Poell, 1998), as when employees are viewed as just reactive to the strategies of trainers and managers (Easterby-Smith, 1997). A challenge to this type of thinking, given the structure of social relations at work, is much more likely to be a collective rather than an individual effort. For example, Heidegger (1997) argues that the ability for workers to be more pro-active in self-directing aspects of their working and learning should be built into the initial

education and training of skilled workers in Germany. His argument is that it is not enough for skilled workers to be able to respond to the changing requirements of our society. Instead they need the skills and knowledge to be able to shape the application of technology and the social form of work for themselves, thus emphasising the dialectical relationship between education, technology and work.

The social nature of work-related learning and knowledge development is perhaps most clearly evident in those cases where an individual forms a close attachment to her or his immediate work-group. This not only draws attention to the social context in which knowledge is acquired, developed and applied, but also how influences the processes by which the individual learns. Indeed the basic structures for the interpretation of experience, although based on idiosyncratic frameworks that at the same time favour and limit the individual process of sense-making (Resnick, 1991), can themselves be shared, developed and changed through interaction with other members of the work-group (Brown, 1997). Individuals learn what type of learning will be useful to share with colleagues. This could involve the co-production of theoretical knowledge and practical knowledge (Brown et al., 1989) to perform more effectively, but it could also be knowledge about where and from whom further knowledge could be gained.

The social nature of work-related knowledge is stressed in the cultural-anthropological perspective. For instance, Orr (1996) analysing the working behaviour of work groups for repairing photocopiers, shows that these technicians develop their knowledge over time through problem-solving and continuous interaction. The defects of the machines they have to cope with are often very different to the ones reported in the standard operating manuals. Therefore problem-solving and problem-setting happen collectively on the basis of previous experiences of each member of the group and on the basis of various types of communication, even the informal chatting around the coffee-machine. This way, knowledge is continuously created and maintained within a specific community of practice, having its own language and myths (developed partly through the handing down of war stories, reporting the main events of machine repairing and client dealing). In this way individuals can learn from the experience of others, but they also need to be able to direct their own learning such that they can make contributions to these knowledge development and sharing activities.

Ideas about the application of tacit knowledge in particular social contexts have been developed further by Nonaka and Takeuchi (1995), in considering how knowledge in organisations, especially in the most innovative enterprises, is created through the interaction between tacit and explicit knowledge, continuously 'converting' one into the other. In this perspective, organisational knowledge creation is dependent upon sharing learning through expanding 'communities of interaction', that cross sectional, departmental, divisional, and organisational boundaries in the organisation (Attwell et al., 1997). Organisations, with business processes highly dependent upon the continuing development of work-related knowledge in work-groups or project teams, are therefore particularly interested in whether new recruits will be able to make substantive contributions to the creation and development of work-related knowledge (Brown and

Attwell, 1998). The organisations want individuals who have both the ability to engage in self-directed learning and who are able to collaborate with others in knowledge creation, development and sharing.

Some organisations have been devolving increasing responsibility for learning and development to the work-group. For example, 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). Poell (1998) draws attention to how group work-related learning projects can be organised around a "work-related theme or problem, with a specific intention to learn and to improve work at the same time" (p. 9). 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, 1996) or upon a readiness to set up activities for learners to learn and work **as a group.**

The social context created by a co-operative approach can also enhance the motivation and commitment of the learners. Blagg et al. (1994) see guided group work 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. Overall then, involvement with and commitment to a workgroup may influence individual commitment to all forms of learning at work, including self-directed learning.

5. THE INFLUENCE OF PERSONAL RELATIONSHIPS UPON INDIVIDUAL COMMITMENT TO SELF-DIRECTED LEARNING AT WORK

So far the social influences on individual commitment to self-directed learning at work considered have been those emanating from membership of particular organisations, occupations or work-groups. However, more directly personal relationships can also play a significant role, particularly in encouraging an individual to engage in self-directed learning that is more tailored to them as an individual. This is partly because the focus and ideas about learning arising from the more formal groups often relate to experience, practice, knowledge, development and understanding applicable to the immediate circumstances and contexts of action. The emphasis is upon the development of interpretative thinking related to current practice, rather than developing a capacity to think beyond this and in terms of extended generalised action (Lave, 1993). Communities of practice are tautologically mainly focused upon the concerns of practitioners as a collective group. However, individuals may come to see membership of a particular community as but one phase of their career development. In such

circumstances, the encouragement of others can give a focus to self-directed learning at work that goes beyond the immediate context.

An example of this was a modern languages teacher at a secondary school, who received considerable encouragement from a local Information Technology (IT) Adviser to develop innovative ways to use IT to enhance foreign language teaching. The programme of development undertaken by the teacher depended upon his commitment to self-directed learning, but was underpinned by the encouragement of the adviser. Significantly, this encouragement was social rather than practical: valuing the work and using the teacher to demonstrate good practice at staff development sessions elsewhere in the county. The more social approbation the teacher received the more driven he was in his programme of self-directed learning and his commitment to be at the leading edge of innovation in foreign language teaching. The teacher eventually was spending up to thirty hours a week on development in addition to a full teaching load. By this time, however, the teacher's reference group was not his immediate community of practising teachers, but rather the wider education community. Upon the back of the reputation as an innovative teacher he was able to secure a national advisory post.

Now this case illustrates the dual nature of even self-directed learning as both individual and social. For long periods the teacher was learning on his own. However, the reflexive dimension to what he was doing, the value of what he was doing and how he was developing as a learner and as a producer of new knowledge was reinforced through the relationship with the adviser and in meetings with fellow teachers, who recognised the worth of his development work. Now recognition of personal worth by an influential sponsor or mentor and recognition by your community of peers can be powerful drivers to individual programmes of self-directed learning. That this anecdote is not an isolated case can be seen from the work of Eraut et al. (1998b) on learning at work. They found many examples of organised but relatively informal learning support through reference to unofficial sponsors, mentors or 'designated experts', where the support was a function of a personal network of relationships. In such circumstances know who is a kind of knowledge which is becoming increasingly important (Lundvall and Johnson, 1994). This know who refers to a mix of different kinds of skills, in particular the social skills, allowing the access and use of knowledge possessed by someone else, often through a combination of professional and personal networks (Eraut et al., 1998a).

This type of personal encouragement for more expansive forms of self-directed learning at work could be undermined by pressures due to a perceived shortage of time and work intensification in some organisations. If informal support for learning is undermined by work intensification it may mean that organisations should pay greater attention to the need for self-directed learning to be formally supported (Eraut et al., 1998a). For example, where the amount of work to be done and the speed with which people are expected to work reinforce the routinisation and short-term nature of thinking in even complex work, this inevitably squeezes time for medium to long-term thinking and review of practice. Hence people need support to help them engage in patterns of thought conducive to learning, simply because of the amount of their time bound up with

routinised behaviours. That is, they need to be given time and space to engage in critical thought, self-reflection and personal development. This should include opportunities for both collaborative and self-directed learning.

6. NETWORKS

So far I have outlined different types of social influence that may impact upon individual commitment to self-directed learning at work. In practice, of course, a number of these communal and inter-personal influences may be operating at the same time upon any one individual, as individuals may be part of a complex network of relationships at or through work. Now particularly where individuals are in roles involving significant learning and development, then some of these networks will be explicitly concerned with knowledge creation, development and transformation, and they will be underpinned by complex sets of social relationships (Lundvall and Johnson, 1994). In such circumstances access to and participation in these networks will greatly influence what and how an individual learns.

It might be argued, however, that this has little to do with self-directed learning, it can be explained in terms of a newcomer learning to become a full member of the network through a process of legitimate peripheral participation (Lave and Wenger, 1991). However, this ignores three factors. First, the individual acts to change and shape the evolving network, which is a dynamic rather than a static entity (Brown, 1997). Second, the individual has to make choices about the nature, location, type of their contribution and so on. Third, the very complexity of these networks and their underpinning social relationships means that in a very real sense the direction of the individual's learning has to be under the control of the individual. Hence we return to a paradox: the sheer number, complexity and variety of social influences upon how an individual learns at work, when their role requires significant learning and development, means that the learning has in one sense at least to be essentially self-directed.

7. CONCLUDING COMMENTS

An examination of the value of self-directed learning at work might be thought to be amenable to a straight forward review of the costs and benefits to individuals and companies. However, individualistic accounts of learning which do not acknowledge the social dimension to learning are insufficient, and so are accounts of learning organisations that operate with simplistic assumptions about individual knowledge development and transfer. Knowledge development and learning in organisations should be viewed as social processes (Gibbons et al., 1994; Lave and Wenger, 1991; Engeström, 1995). Thus individual learning at work is mediated by the perspectives of others about what should be learned and how it should be learned, even where the learning is largely self-directed. The perspectives of other individuals towards learning are similarly not free-standing, but rather are linked in some way to particular communities of practice, which develop a

collective 'knowledgeability' (Lave, 1993). Individual learning at work therefore needs to be understood in terms of specific contexts, with particular communities of practice, and specific sets of relationships within those communities. Viewed in this way from whom individuals learn and whom they take their ideas about learning at work is itself an important issue. The nature, direction, extent and commitment of an individual to self-directed learning at work can therefore be strongly influenced by the set of social relationships that an individual has with others at and through work.

8. REFERENCES

- Attwell, G., Jennes A. and Tomassini, M. (1997). Work-related knowledge and work process knowledge. In A. Brown (ed) **Promoting vocational education and training: European perspectives,** Tampere: University of Tampere Press.
- Beinart, S. and Smith, P. (1998). **National Adult Learning Survey**, Department for Education and Employment Research Report 49, Sheffield: DfEE.
- Blagg, N., Ballinger, M. and Lewis, R. (1994). Core skills and training for transfer, **Thinking and Learning at Work**, Spring 1994.
- Brookfield, S. (1986) **Understanding and facilitating adult learning: a comprehensive analysis of principles and effective practices**, Milton Keynes: Open University Press.
- Brown, A. (1997). A dynamic model of occupational identity formation. In A. Brown (ed) **Promoting vocational education and training: European perspectives**, Tampere: University of Tampere Press.
- Brown, A. and Attwell, G. (1998). Changing patterns of youth training and the business process: a European perspective, Business Process Resource Centre Professional Development and Training Working Paper 3. Coventry: University of Warwick.
- Brown, J., Collins, A. and Duguid, P. (1989). Situated cognition and the culture of learning, **Educational Researcher**, 18, 1, 32-42.
- Coffield, F. (1997). Introduction and overview: attempts to reclaim the concept of the learning society, **Journal of Education Policy**, 12, 6, 449-455.
- Easterby-Smith, M. (1997). Disciplines of organisational learning: contributions and critiques, **Human Relations**, 50, 9, 1085-1113.
- Engeström, Y. (1995). **Training for Change,** London: ILO.

- Eraut, M., Alderton, J., Cole, G. and Senker, P. (1998a). Learning from other people at work. In F. Coffield (ed) **Learning at work**, Bristol: Policy Press.
- Eraut, M., Alderton, J., Cole, G. and Senker, P. (1998b). **Development of knowledge and skills in employment**, Institute of Education Research Report 5, Falmer: University of Sussex.
- Gear, J., McIntosh, A. and Squires, G. (1994). Informal learning in the professions. Hull: University of Hull School of Education.
- Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. and Trow, M. (1994), **The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies**, London: Sage.
- Heidegger, G. (1997). Key considerations in the education of vocational education and training professionals. In A. Brown (ed) **Promoting vocational education and training: European perspectives**, Tampere: University of Tampere Press.
- Infelise, L. (1994, June). In-company training: new frontiers in Europe. Paper presented at the Third International Interdisciplinary Conference of the International Research Network on Education, Training and Development (IRNETD), Milan, Italy.
- Jones, A. and Hendry, C. (1994). The Learning Organisation: Adult learning and organisational transformation, **British Journal of Management**, 5, 153-162.
- Keep, E. and Mayhew, K. (1996). UK training policy assumptions and reality. In A. Booth and D. Snower (eds) **Acquiring skills: market failures, their symptoms and policy responses,** Cambridge University Press: Cambridge.
- Lave, J. (1993) The practice of learning. In S. Chaiklin and J. Lave (eds) **Understanding practice: perspectives on activity and context,** Cambridge: Cambridge University Press.
- Lave, J. and Wenger, E. (1991) **Situated learning: legitimate peripheral participation**, Cambridge: Cambridge University Press.
- Legge, D. (1982). **The education of adults in Britain**, Milton Keynes: Open University Press.
- Lundvall, B. and Johnson, B (1994). The learning economy, **Journal of Industrial Studies**, 1, 2, 23-42.
- Nonaka, I. and Takeuchi, H. (1995). **The Knowledge Creating Company. How Japanese companies create the dynamics of innovation**, Oxford: Oxford University Press.

- Orr, J. (1996). **Talking about machines: an ethnography of a modern job**, Ithaca, NY: IRL press.
- Pettigrew, A., Arthur, M. and Hendry, C. (1990). **Training and human resource** management in small to medium sized enterprises, Sheffield: Training Agency.
- Poell, R. (1998). **Organising work-related learning projects: a network approach**, PhD thesis, Catholic University of Nijmegen. Nijmegen: Poell.
- Rajan, A., Chapple, K. and Battersby, I. (1997). **Graduates in growing companies: the rhetoric of core skills and reality of globalisation**, Strategic issues for central London Working Paper. London: FOCUS Central London.
- Resnick, L (1991). Shared cognition: thinking as social practice. In L. Resnick, J. Levine and S. Behrend (eds) **Perspectives on socially shared cognition**, Washington DC: American Psychological Association.
- Soskice, D. (1993). Social skills from mass higher education: rethinking the company-based initial training paradigm, **Oxford Review of Economic Policy**, 9, 3, 101-113.
- Vickerstaff, S. (1992). The training needs of small firms, **Human Resource** Management Journal, 2, 3, 1-15.