

Apprenticeship as a Conceptual Basis for a Social Theory of Learning

David Guile and Michael Young

Post 16 Education Centre

Institute of Education

University of London

1. Introduction

There is renewed interest in the institution of apprenticeship¹ The most obvious one is that a number of reasons for the increasing number of governments (the USA and in the European Union) are trying to strengthen the skill base of their future work force by establishing a new form of apprenticeship that fulfils some of the functions of traditional craft apprenticeships but takes into account their weaknesses as well as the new demands of late 20th century economies. The second reason is the emergence of a literature on learning organisations, and more generally the idea that if societies of the future are to be economically competitive, they have to become learning societies and individuals have to be lifelong learners. The concept of apprenticeship in this context is particularly attractive. Not only does it focus attention upon an active role for individuals in organising their own learning, it also implies that individuals have prime responsibility for putting themselves in a position to learn.

We share the interest in the modern forms of apprenticeship that are being developed in the UK and other countries. However, our focus here is on apprenticeship as a social institution. The concern of this paper is, therefore, conceptual rather than substantive. Following cultural anthropologists such as

Jean Lave, we are interested in the potential of apprenticeship as the basis for a social theory of learning. Existing approaches to learning tend to rely on behaviourist and individualist assumptions, be dependent on transmission pedagogies and the concept of the transfer of decontextualised knowledge to vocationally specific contexts, or associated with cognitive science accounts of expertise as the stable individual mastery of well-defined tasks. Our particular interest is in how far the reconceptualisation of apprenticeship along the lines we propose will lead to the development of new pedagogic criteria that might constitute the basis for a theory of 'reflexive learning'.²

This paper has five sections. Section 1 is a brief discussion of the main sociological approaches to work and learning at work in order to make clear how they differ from the approach developed here. In Section 2, we analyse the concept of apprenticeship and highlight several critical issues which neither the traditional assumptions of concept itself, nor subsequent attempts to modify it, have considered. Section 3 is a brief critical examination of previous attempts to reformulate the concept of apprenticeship³ as a basis for a broader-based theory of learning within formal education. In response to the issues raised in the previous sections, Section 4 considers recent developments in what is known as activity theory (Vygotsky 1978, Cole and Scribner 1971 and Wertsch 1981). In particular we consider the ideas of 'zones of proximal development', and 'learning as social practice' and assess their potential as a basis for a more inclusive social theory of learning. The paper concludes with brief comments on the possible implications of the approach to learning that is developed in this paper for a number of current concerns in vocational education and training; we give particular consideration to 'lifelong learning', 'collaborative'/'transformative' learning and 'knowledge production'.

2. Learning at work: sociological perspectives

Sociologists and political economists have attempted to identify the effects of changes in work upon human consciousness and activity since the beginning of the industrial revolution (Smith 1776, Marx 1844). The main macro sociological debate about work within industrial and organisational sociology, sometimes dubbed the labor-process debate (Wood 1982, 1989), was originally concerned with a general assessment of the effects of automation upon skill levels of workers and their collective sense of social identity (Blauner 1964) and the nature of workplace socialisation (Braverman 1974, Noble 1991). However, during the 1980s and early 1990s the focus of these debates shifted significantly, concentrating on such new production concepts as ‘post-Fordism’, ‘flexible production’ and ‘lean production’ (Warner et al 1990, Womack et al 1991).

In reviewing this body of work, Casey comments that it has long been recognised that:

‘work is an educational site in which pedagogical and learning practices have always taken place’ (Casey 1996)

Casey identifies the existence of two alternative sociological perspectives on work and learning. One originates from industrial sociology and labour education and adopts a macro-sociological analysis. Research within this tradition has endorsed the link between formal training and development programmes and economic success. It explicitly argues that the quality of workplaces ought to be evaluated in terms of the educational opportunities and the learning environments that they provide for workers, and stresses that responsibility for planning learning opportunities ought to be a manifest function of senior management in all workplaces (Leymann and Kornbluh 1989, Keep 1995, Pipan 1989, Streek 1987, 1994). On the other hand, as Casey points out, researchers who have been influenced by the ethnographic studies of the ‘Chicago School’ have adopted a completely different perspective. One of the underlying premises of the ‘Chicago School’ has always been that work serves as a primary site of socialisation. However, the main focus of their research has been to explore the ‘hidden’ or unintentional outcomes of workplace socialisation rather than analysing the purpose and

structure of formal training and development programmes (Becker et al 1961, Geer 1972, and Hughes 1958, 1971).

Despite the fact that much of the research which has emanated from these two sociological perspectives recognises the different ways that work can serve educational purposes, neither has systematically addressed the nature of workplace learning, nor identified which pedagogical practices actually support it. Even Streek's highly sophisticated analyses of changing workplace skill needs and the 'institutional preconditions' required to support their development, falls short of articulating any pedagogic strategy to successfully accomplish skill development in modern production. It goes little beyond endorsing the value of integrating formal and informal learning (Streek 1994). Streek does not even acknowledge the existence of a debate as to which approaches to learning might be more valuable for assisting individuals and teams to develop the workplace capabilities that he argues are required in 'diversified quality production' (Streek 1994). Where research has focused directly upon apprenticeship within different occupations groups, it has mainly adopted a sub-cultural perspective. Thus apprenticeship has been viewed as a process of socialisation into official or unofficial workplace cultures and not explicitly as an approach to learning.

3. The concept of apprenticeship

The view of learning implicit in the traditional concept of apprenticeship involves four main elements - the apprentice as learner, the idea of trade or craft knowledge as fixed and unproblematic, the master as teacher and the idea that learning in workplaces is a form of context-bound understanding not conducive to transfer (Pratt 1993). Moreover, in both the classic cognitive psychology and anthropology of education, apprenticeship is portrayed as lacking an explicit theory of instruction and not dependent upon any formal teaching (Cole and Scribner 1971, Collins et al 1989, Coy 1989). Learning is seen as a natural process that occurs via observation, assimilation and emulation which happens over time without any substantial intervention from more experienced others. Research from

other branches of social science⁴, however, has identified models of apprenticeship that embrace formal and informal learning within structured on- and off-the job training provided by employers (Brown et al 1995, Fuller 1996). Nevertheless, one of the overriding conclusions of these studies is that apprentices and employers are still inclined to accord primary importance to formal learning and to downgrade informal learning as limited to the acquisition of craft knowledge.

The focus on apprenticeship in developing a theory of learning, therefore, is valuable in that it directs us away from the idea of transmission towards learning as a process in which the apprentice is involved in 'learning by doing' with the 'master' as the major role model. Moreover, the idea of apprenticeship creates the overriding impression that expertise is developed through the gradual accumulation of experience under the guidance of an established master⁵. The model of knowledge within apprenticeship tends to be a combination of trade or craft knowledge handed down by the master and the implicit knowledge (similar to Zuboff's 'action oriented skills' (Zuboff 1988) that is part of all activity.⁶

The traditional concept of apprenticeship tends to be generalised unproblematically and applied to any craft, profession or process in which people acquire forms of expertise (Insight 1994). Such generalisation assumes that the process of learning is invariant and the same for all types of apprenticeship. However, in practice work contexts vary widely. In some cases they are relatively routine and require little explicit knowledge, whereas in others are highly knowledge-intensive. Also work contexts vary according to whether the knowledge involved is a 'traditional' craft or constantly developing body of 'theory' (Gott 1995). As a consequence, theories of learning not only need to take account of differences in the degree of expertise needed within specific occupations, but also in differences in the content and quality of such expertise (Engestrom 1997). Moreover, the nature of workplace practices and the demands they make on apprentice learners are likely to be quite different when different forms of knowledge or work are involved. This is apparent from studies of both workplaces and classrooms. Studies of work teams who repair state of the art warplanes (Gott 1995), accounts of collective learning amongst a group of service technicians (Orr 1990), as well as studies

of 'cognitive apprenticeship' in education (Collins et al 1989) and 'apprenticeship in thinking' (Brown et al 1993) have all highlighted how collaborative practices mediate opportunities for learning. It is hardly surprising, therefore, that such studies frequently imply the need for further analysis of the complex interrelationship between cognition and context and the further development of the model of learning associated with traditional apprenticeships.

3.1 Conceptualising apprenticeship as a social theory of learning

A growing body of research on learning and cognition which focuses on the cultural context has introduced a new focus into the debates about the interrelationship between cognition, context and practice. Such studies have begun to draw attention to how the process of learning always involves changes in knowledge and action, and how such changes are central to learning and the development of new forms of practice (Chaiklin and Lave 1993, Engestrom and Middleton 1997). These studies have highlighted some of the weaknesses of the traditional understanding of apprenticeship. A number of examples illustrate this point. First, they stress the importance of how knowledge is socially constructed and how the new apprentice becomes part of a work-based 'community of practice' (Lave and Wenger 1991). Second, they emphasise learning as a process of 'boundary crossing' mediated by access to different communities of practice (Lave 1993, Engestrom et al 1995). Third, they show how learners increasingly need to relate scientific and everyday concepts in making sense of workplace practices or problems (Gott 1995). Fourth, they point to how resources external to 'communities of practice' maybe needed to overcome internal contradictions (Engestrom et al 1997). Fifth, they indicate how 'learning' technologies can be seen as 'resources' for learning and that to do so involves the rethinking of assumptions about intelligence, learning and workplace activity (Tikhomirov 1981, Pea 1993).

It is our contention that the work of Lave and Engestrom in particular builds upon the concept of apprenticeship and provides a more adequate basis for developing a social theory of learning. It is this possibility that the remainder of the paper addresses.

3.2 Apprenticeship, formal education and the zone of proximal development

As noted earlier in this paper, it has traditionally been assumed that formal education and apprenticeship involve quite different modes of learning, quite different teaching strategies and result in different capacities to transfer knowledge and skill from one context to another (Cole and Scribner 1973). However, we take the view with Lave (1996) and recent work following Vygotsky (Engestrom et al 1995, Newman 1989) that it is more useful to assume that there are common processes underlying the learning in school and work-based learning. Vygotsky's concept of the zone of proximal development (Vygotsky 1978) in particular, provides a useful way of building on this assumption.

Many educationalists have acknowledged the critical importance to our understanding of pedagogy and the design of learning programmes of Vygotsky's concept of the 'zone of proximal development' (Britton 1987). The concept is central to Vygotsky's theory and it has been modified and developed by Cole and Schribner in the USA (Cole and Schribner 1981), and given a broader interpretation within 'activity theory' (Wertsch 1981, Griffen and Cole 1985). and in the soviet tradition of psychology by Leontiev via his notion of 'cultural practices' (Leontiev 1981)

Vygotsky defined the 'zone of proximal development' as:

'the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more able peers' (Vygotsky 1978).

The concept was central to Vygotsky's programme of trying to identify the pedagogic structure(s) needed to assist learners move beyond the stage of mastery that they were capable of on their own. One consequence of the various reconstruction's of Vygotsky's original ideas has been the development of a series of pedagogic strategies such as 'scaffolding', 'modelling' and 'fading' which

have been designed to assist teachers to help children to participate in activities slightly beyond their current competence (Brown et al 1989).

Over the years neo-Vygotskian and other cognitive psychologists have offered many different interpretations of the concept of the 'zone of proximal development'. Some have restricted the use of the concept to child development. For example Rogoff has argued that the 'zone' is a dynamic region of sensitivity to learning the skills of a culture in which children develop through 'guided participation' in problem solving with more experienced members of the culture (Rogoff 1991). Rogoff was therefore able to extend Vygotsky's focus on the basic teacher / student relationship and include the interrelations between children, their caregivers and other companions. She was thus able to understand how they learn to participate in the skilled activities of a culture.

Davydov on the other hand argues that the 'zone' refers to a 'cultural region' where children close the distance between the extent of known scientific knowledge and their particular knowledge (Davydov, 1985). One consequence of this insight has been that Brown and Collins and their colleagues have been able to show that formal learning can be enhanced if the skills and knowledge that students learn are embedded in a social and functional context. They proposed students should be given ill-defined tasks and real-world problems in order to explicitly enculturate them into the ways of knowing, cultural practices and belief systems of the school discipline in question (Collins et al 1989, Brown 1993). Cole, on the other hand, broadened the use of the concept by suggesting that culture and cognition create each other within the 'zone' via a dynamic interrelationship between people and social worlds as expressed through language, art and understanding. Accordingly, Cole laid the conceptual foundations for the concept to be applied to human development in general, rather than being restricted to analyses of child development (Cole 1985).

3.3 The zone of proximal development and apprenticeship

As we stated at the beginning of this paper, one of the main attractions, from our point of view, of Lave's proposal that a reconceptualisation of apprenticeship could be the basis for a social theory of

learning was that it provides an approach that does not rely on behaviourist and individualist assumptions about the learner or on transmission model of teaching. Lave built upon Cole's original argument that culture and cognition create each other within the 'zone of proximal development'. Her concept of apprenticeship emphasises the dynamic interrelationship between social, cultural, technological and linguistic practices. Furthermore, she identifies how such practices afford, over a period of time, individuals and groups opportunities to learn. In this way she highlights the collective nature of learning (Lave and Wenger 1991, Lave 1996).

By adopting a social and cultural perspective on the zone of proximal development, Lave is able to reveal greater commonality between formal education and apprenticeship than has usually been accepted. By this observation we do not mean to imply that she is simply rejecting the work of those who have addressed the differences between apprenticeship and formal education; of course there are differences. It is a question of a shift in perspective and can be illustrated by reference to recent studies of technical and professional apprenticeships ⁷. Each study develops (at least implicitly) its own conception of the zone of proximal development as applied to the different forms of apprenticeship they are analysing. Each study assumes that learning occurs through such well established processes as observation, assimilation and emulation. Accordingly, 'apprentice learners' are assisted to extend their capabilities beyond their current levels of work performance. The underlying pedagogic practices are implicit, rather than explicit. However, each study also reveals how apprentices generate new knowledge, an outcome that has previously been assumed to be only associated with formal learning.

Despite this recognition, these studies still retain a conception of the 'zone of proximal development' that sees apprentices as largely learning from experts. This has a number of implications. First, it continues to limit the focus to an individualistic approach to learning at the expense of acknowledging the importance of the social and cultural processes that shape learning (Guile and Young 1996). Secondly, it fails to differentiate between the 'official' conceptions of knowledge offered to apprentices within their formal training programmes and apprentices' own skills of acquiring, within a

community of practice, the forms of tacit knowledge relevant to their emerging job-related needs (Orr 1991, Ghererdi et al 1997). Third, it maintains a focus upon learning existing work practices and skills, rather than pointing to how new forms of 'organisational and occupational capability' needed by many forms of advanced production can be encouraged (Prospect Centre 1991). Finally, these studies assume, by implication, that the traditional features of apprenticeship as a learning context—for example, strong hierarchical divisions of labour, an emphasis on task specific skills and the close proximity of craft or professional 'experts'—will remain constant. On the other hand, there is growing evidence of shifts in the organisation of work⁸, in the emergence of demands for more generic problem solving abilities and of greater levels of collaboration and devolved responsibility. These changes clearly emphasise the need for an approach to learning that links the way employee identities are formed to the increasingly collective character of work and supports a greater degree of self-reliance so that learners are able to cope with the changes in work that are taking place.

4. Reconceptualising apprenticeship

4.1 Extending the uses of the zone of proximal development

The appeal of Vygotsky's theory lies in the emphasis it places on the idea of mind *in* society (Vygotsky 1978), and its associated focus of cognitive development in specific contexts. As Rogoff has argued:

'from a socio-cultural perspective the basis unit of analysis is no longer the (properties of the) individual, but the (processes of the) socio-cultural activity, involving participation in socially constituted practices' (Rogoff 1991).

This perspective has offered contemporary researchers a way of escaping from the hegemony that behavioural, and, more recently, constructivist, theories of cognitive development have held on learning (Cole 1985, Scribner 1973, Lave 1996, Engestrom 1995, Wertsch 1985). Over the last few

years neo-Vygotskians and other cognitive psychologists have started to examine the processes through which cognition is developed among individuals and groups in different types of situation. As Starr has argued, this focus on the relationship between context, cognition and pedagogy has been particularly fuelled by:

'the failure of rationalism to account for or to prescribe people's behaviour (which is not new) and what is new, a large interdisciplinary movement in the academy and in the sciences that is documenting this state of affairs' (Starr 1997)

Dissatisfaction with 'rationalist' explanations of human behaviour has led researchers to begin to critique those approaches to pedagogy that involve presenting conceptual knowledge that is abstracted from the situations in which it is to be learned and used (Layton 1993, Starr 1997, Lave 1996).

This shift from a 'mentalist' to a 'culturalist' perspective on the process of cognitive development has been accompanied by the development of alternative conceptions of the zone of proximal development. Two examples of such alternative conceptions are to be found in Lave's work on identity formation and skill development among West African apprentices (Lave and Wenger 1991), and Engestrom's work on the social transformation of the organisation of work (Engestrom and Cole 1994, Engestrom 1993, Engestrom 1997). It is through this reconceptualisation of the 'zone of proximal development' that we shall suggest the concept of apprenticeship may provide the basis of a social theory of learning. One consequence is likely to be a shift from understanding apprenticeship as a 'social institution' inextricably bound up with traditional craft activities and technical skills, to seeing it as a basis for conceptualising the process of learning that is more broadly applicable to a variety of modern work contexts.

4.2 The zone of proximal development: a societal perspective

Lave and Wenger identify what they define as a 'societal' perspective on 'zones of proximal development':

'we place more emphasis upon connecting issues of sociocultural transformation with the changing relations between newcomers and old-timers in the context of a changing shared practice'

In contrast to the more normative interpretations of the zone of proximal development referred to earlier, the 'societal' perspective highlights the historical and social dimensions of learning. Firstly, it directs attention to the distance between individuals' everyday activities and the historically new forms of social practice that need to be collectively generated as solutions to everyday problems. Secondly, it identifies learning as a social process and acknowledges the contribution that technological and other external 'resources' can make in support of such learning processes.

Lave and Wenger are interested in (i) identifying how social structures and social relationships influence the process of learning over time, (ii) the importance of relationships between one context of learning (or 'community of practice' to use their term) and another, and (iii) the opportunities available for learning within such communities, and the human and technological resources that support them. They conceive of learning:

'in terms of participation (since it) focuses attention on ways in which it is an evolving, continuously renewed set of relations' (Lave and Wenger, 1991).

Furthermore they argue that participation:

can be neither fully internalised as knowledge structures (within individual minds) nor fully externalised as instrumental artefacts or overarching activity structures. Participation is always based on situated negotiation and re-negotiation of meanings in the world. This implies that understanding and experience are in constant interaction - indeed, are mutually constitutive' (Lave and Wenger, 1991).

Viewing the relationship between learning, activity and sociocultural contexts as a mutually constitutive process within 'communities of practice' leads Lave and Wenger to challenge the idea that expertise in a given field is invariant and consists of mastery of discrete tasks and skills. This leads them reconceptualise intelligence as a distributed process rather than as an attribute of individuals. Their argument suggests that 'zones of proximal development' are populated by such resources as physical and cultural tools, as well as other people, and that these resources are used, or come together to be uses to shape and direct human activity. It follows that, from their perspective, intelligence and expertise are acquired through a process of accomplishment, rather than being a matter of self-possession. As Lave comments (Lave 1993):

People in activity are skilful at, and are more often than not engaged in, helping each other to participate in changing ways in a changing world (Lave 1993).

This is not to deny that individuals develop particular forms of 'knowledgeability' (i.e. forms of knowledge and skill). However, Lave and Wenger's emphasise the collective basis though which individuals develop a social identity, learn new forms of social practice, and become 'knowledgeable'. By 'knowledgeability' they mean the combination of knowledge and skill required to successfully operate within a 'community of practice'.

Lave and Wenger's 'societal' conception of the zone of proximal development introduces a radically different approach to three issues that are central to any understanding of learning in modern societies. First, they emphasise that activity, meaning, cognition, learning and knowing must be seen

in relation to each other (Lave 1991). Second, they indicate the importance of studying how people develop their social identities through participation within different ‘communities’ and in more than one ‘community’. Third, they highlight the importance of examining how individuals maintain their identities and sense of meaning while moving across organisational and cultural boundaries.

As already noted, Lave and Wenger argue that learning is not a special mental process, rather it is:

‘a relational matter, generated in social living, historically, in social formations whose participants engage with each other as a condition and precondition for existence’ (Lave and Wenger, 1991).

Thus learning becomes a matter of developing a variety of identities within different ‘communities of practice’. Such a perspective offers a fresh perspective on the question of transfer of skills and knowledge. For most research, ‘skill transfer’ as evidence of learning, refers to whether students are able to take ideas into workplaces that have been learnt within a formal educational process. As a result there is a tendency to ascribe ‘failure to learn’ to factors concerning the social pathology of individuals or of the teachers. This diverts attention away from the importance of providing opportunities for individuals to participate in workplace ‘communities of practice’. By contrast, Lave and Wenger’s approach highlights how providing an extended range of opportunities in workplaces can enhance personal and group learning and encourage students to try out ideas learned in school or college. It follows that increasing access and participation, within and between different ‘communities of practice’ will increase individual and collective ‘knowledgeability’.

Lave and Wenger’s analysis add another dimension to reformulating existing ideas about skill transfer. Conventional approaches usually assume contexts are invariant⁹ They also rely upon a narrow transmission models of teaching and play down recognition of the meaning of any skill to learners. The assumption is that the message to be transferred is always understood thus it is assumed that there is no need to address how new knowledge might be produced within the contexts between

which the knowledge or skill is to be transferred. Nevertheless as many studies have demonstrated, accomplishing the transfer of learning and crossing organisational boundaries is a complex and challenging process (Engestrom and Middleton 1997). It involves people developing the capacity to think beyond the immediate situation that they find themselves in and understanding why it might be both possible and necessary to generate new knowledge.

4.3 The zone of proximal development: a transformatory perspective

In order to address how people learn to do things that they have not previously accomplished, Engestrom elaborates the idea that 'zones of proximal development' are collective and can be the basis for the transformation of contexts, cognition and practice. He concentrates upon identifying how collaborative activity is needed to reconfigure workplace activity and knowledge (Engestrom 1993, 1995). He recognises that many existing approaches to learning assume that it involves the circulation of existing knowledge rather than the production of 'knowledgeability' (Guile and Young 1997).

Engestrom also argues that considerable variation exists in the fundamental imprint of the different groups with their different goals and circumstances, on what it might mean 'to know' on a particular occasion, in a particular context, or within the culture of a particular organisation. Consequentially, he shifts the focus from a sole reliance upon 'experts' definitions of what is to be learned and how it is to be learned. He emphasises the importance of encouraging learners to identify contradictions or puzzles within existing knowledge or workplace practice as a way of developing new knowledge. It is these 'problems' which Engestrom sees as legitimate starting points for exploring and designing solutions and therefore for learning (Engestrom and Cole 1994).

Engestrom's studies of the transformation of Health Centre in Finland highlight, as we have argued elsewhere:

'the relationship between different modes of learning, the types of outcome arising from each mode, and the influence of context and conditions upon each mode of learning' (Guile and Young 1997).

Although he accepts Lave and Wenger's premise that learning is a social and reflexive process that leads 'communities' to change their identities over time, Engestrom argues that learning within 'communities of practice' is more consistent with the slow continuous evolution of practice. Nevertheless, as the Health Centre studies demonstrate, crisis points often occur because the 'communities of practice' end up confronting conflicts or problems that are not immediately resolvable (Cole and Engestrom 1993). His research indicates that it only becomes possible for people to learn how to transform existing 'communities of practice' and reconfigure activity more effectively when two conditions are met. These are first, the context of learning must be able to be expanded to include the existing organisation, purpose and 'tools' of work, and its location in the wider community. This avoids adopting a narrow focus upon 'here-and-now' problems and relatively quick-fixes. It also enables new possibilities for the organisation of work to be extensively debated and their likely implications for other related activities to be considered prior to any process of change (Engestrom 1996). Second, concepts and ideas that are external to the community may have to be introduced as a basis for enabling the felt dilemmas and contradictions within the *community of practice* to be reconceptualised. As Engestrom's field studies indicate, this enables participants to construct a vision of the past and the future of their specific activity systems (Engestrom et al 1996).

In contrast to Lave and Wenger, Engestrom retains a role for concepts and learning technologies that are external to an organisation's existing culture and environment. In the case of information technologies, Pea's work makes clear that they can be used to enhance individual learning within given parameters; this involves a normative conception of the 'zone of proximal development'; an alternative is that the pedagogic basis of learning is reorganised (Pea 1993). The implication of Pea's argument is that information technology can be used to create the possibility of 'communities of practice' being extended to become **distributed communities of learning**. Such **communities** would enable their members to extend the sources of information to which they had access, expand their socio-cultural basis and develop new forms of 'knowledgeability'.

Furthermore, as he points out elsewhere elsewhere (Engestrom 1995), Engestrom also advocates using a learning cycle that explicitly incorporates context cognition and contradiction. Unlike Kolb's (1984) much better known approach, Engestrom's learning cycle enables individuals and groups to connect the current level of their understanding about practice to emerging ideas as to how to transform practice. At the same time, he indicates that new conceptual and technological resources must be used sensitively within 'communities of practice', if they are to complement the forms of learning already engaged in within communities. We have argued elsewhere that such activity can be described as a process of 'reflexive learning' (Guile and Young 1997) and is the 'micro' expression of the 'macro' process of reflexive modernisation (Beck, Giddens and Lash 1994).

It follows therefore, that, contrary to the assumption of traditional approaches to apprenticeship that learning is implicit and informal and pedagogy is irrelevant, it becomes possible to identify how pedagogic structures are embedded within workplace activity. Lave and Wenger (1991) stress the idea of **situated learning** which sensitises us both to the negotiated character of learning **as a social practice** and to how opportunities to participate within workplace cultures influences whether and how we learn. Hence, their emphasis upon the social character of the 'zone of proximal development'. Engestrom, however, goes one stage further with his idea of 'transformative' learning, which, rather than only focusing upon the transmission of existing knowledge, acknowledges the importance of new knowledge being produced within workplace communities. The critical issue for Engestrom is that although transformative learning has to be designed, design focuses on more than formal teaching and has take into account the context as a whole. He retains a role for a theory of instruction as well as a focus on the social processes, relationships and resources that are needed to support learning. Instruction in this sense involves ensuring that the goals of learning are clear and people are encouraged to think beyond the immediate circumstances. This ensures that the 'zone of proximal development' is collectively organised to facilitate the transformation of context, cognition and practice. As Lave has acknowledged (Chaiklin and Lave 1993), this is the central lacuna in contemporary learning theory. It is of course no less applicable to learning in classrooms than it is to workplace learning and the links between the two.

5. Conclusion

We began this paper by expressing our interest in the question of the relationship between learning and work and the scope of workplaces as sites of learning . We suggested that the concept of apprenticeship could be reformulated to approach these issues. We recognised that although the questions of learning and work are not new to the sociological or educational literature, much of the research which has emanated from both these fields has rarely given specific attention to the nature of workplace learning. Furthermore, it has done little to identify which pedagogical practices might support workplace learning, or to suggest how far the concept of apprenticeship might be more broadly applicable to it and other forms of learning. This led us to argue that the concept of apprenticeship should not be restricted to craft or professional activity, or, more broadly, limited to the historical forms it has taken and their uncritical acceptance of notions such as **learning by doing** and **the master** as the major role model.

We that the growing body of research that has become known as activity theory has introduced a new focus and set of possibilities for building on apprenticeship as an approach to learning. Such studies have begun to draw attention to how the process of learning always involves changes in knowledge and action. Various re-interpretations of Vygotsky's concept of the 'zone of proximal development' have been central to this reformulation of ideas about learning. We identified the existence of three different conceptions of the 'zone of proximal development' - the 'normative', the 'social' and the 'transformational' - and argued that they provide an expanded view of the 'zone' that builds on ideas drawn from studies of apprenticeship and provide the beginning of a social theory of learning.

Specifically, we stressed the importance of the work of Lave and Wenger and Engestrom, and how it enables the focus on learning within apprenticeship to be broadened away from its traditional reliance upon:

- Σ an individualistic conception of the learning process;
- Σ a transmission model of pedagogy;
- Σ the specialist knowledge of experts;

This has led them also to challenge (a) individualistic ideas of intelligence or 'mastery', (b) the idea that knowledge consists of representations within the mind and (c) the idea that skill is the property of individuals.

Both Engestrom's and Lave and Wenger's ideas, therefore, imply that any attempt to use the concept of apprenticeship as the basis of a social theory of learning has to confront and overcome two contradictions that are likely to arise in many different kinds of workplaces. First, there is the contradiction between continuity and displacement within workplace 'communities of practice'. Workplace learning, or 'legitimate peripheral participation' to use Lave and Wenger's expression, can be used (or not used) as a means to ensure the continuity of practice and to provide opportunities for the circulation of 'knowledgeability' amongst members. Second, the same process can be used to respond to learners' differing needs to have a stake in the development of new practices. They can thereby begin to establish their own future identities and develop the capacity for lifelong learning. Accordingly, lifelong learning becomes understood as a social, cultural and collective process, rather than as some mystical and abstract form of 'meta-learning' (Garrison 1993). Whether the former or later tendency predominates will depend amongst other factors, on the goals of management.

The second contradiction is between the form of social organisation involved in the production of the an existing 'commodity' (i.e. what a particular organisation or sub group produces) and that involved in transforming it. Thus, as we have argued elsewhere, ideas about the continuous transformation of production imply that that learning must be linked to the process of production and its attendant forms of social organisation. This involves recognising the importance of those 'institutional preconditions for learning' that either inhibit or facilitate learning within workplaces (Guile and Young 1997).

It is our contention that these are the kind of learning demands that are increasingly being made, implicitly and explicitly by new work places. Reconceptualising the concept of apprenticeship as a social theory of learning along the lines we have described, offers, we would suggest, a basis for turning these demands into practical programmes.

References

- Beck, U. Giddens, A. and Lash, S. (1994) *Reflexive Modernisation*. Cambridge: Policy Press.
- Becker, H. Greer, B. Hughes, E. and Strauss, A. (1961) *Boys in White: Student Culture in a Medical School* USA: University of Chicago Press.
- Blauner, R. (1964) *Alienation and Freedom*. USA: University of Chicago Press.
- Braverman, H. (1974) *Labour and Monopoly*. New York, USA: Capital Monthly Review.
- Bridges, D. (1993) The Skill of Transfer, *Studies in Higher Education*, Vol 18, No 1.
- Britton, J. (1987) Vygotsky's contribution to pedagogic theory, *English in Education*, Vol 21, No 3.
- Brown, A. (1993) Expertise in the Classroom, in Saloman, G. (Ed.) *Distributed Cognition*. Cambridge: Cambridge University Press.
- Brown, A. Evans, K. Blackman, S. and Germon, S. (1994) *Key Workers Technical Training and Mastery in the Workplace*. Bournemouth, UK: Hyde.
- Brown, J. Collins, S. Duguid, P. (1989) Situated Cognition and Culture of Learning, *Educational Researcher*, Vol. 18.
- Casey, C. (1995) *Work Self and Society*. UK: Routledge.
- Chaiklen, S. and Lave, J. (Eds) (1993). *Understanding Practice*. UK: Cambridge University Press.
- Cole, M (1985) The Zone of Proximal Development: where Culture and Cognition Create each other, in Wertsch, J. (Ed) *Culture Communication and Cognition: Vygotskian Perspectives*. New York: CUP.

Cole, M. and Engestrom, Y. (1993) A Socio-Historical Approach to Distributed Cognition, in Saloman, G. (Ed.) *Distributed Cognition*. Cambridge: Cambridge University Press.

Collins, A. Brown, S. J. Newman, S. E. (1989) Cognitive Apprenticeship, in Resnick, L. B. (Ed) *Knowledge, Learning and Interaction Essays in Honour of Robert Glaser*. USA: Erlbaum, New Jersey Press.

Coy, M. (1989) *Anthropological Perspectives on Apprenticeship*. New York: SUNY Press.

Davydov, V.V. and Radzikhovskii, L.A. (1985) **Vygotsky's Theory and the Activity Orientated Approach in Psychology**, in Wertsch, J. (Ed) *Culture Communication and Cognition: Vygotskian Perspectives*. New York: CUP.

Dreyfuss H, L. and Dreyfuss S, E. (1986) *Mind Over Machine*. Oxford: Blackwell.

Engestrom, Y. (1991) Towards Overcoming the Encapsulation of School Learning, *Learning and Instruction*. Vol 1, No.1.

Engestrom, Y. (1995) *Training for Change*. London: International Labour Office.

Engestrom, Y. Viorkkunen, J. Helle, M. Pihlaja, J. Poiketa, R. (1996) The Change Laboratory as a Tool for Transforming Work, *Lifelong Learning in Europe*, Vol 2.

Engestrom, Y. Engestrom, R. and Karkkainen, M. (1995) Polycontextuality and Boundary Crossing, *Expert Cognition Learning and Instruction*. Vol 5, UK: Pergamon.

Fennell, E. (1994) Insight Comment, *Insight* Vol 31. Sheffield: Employment Department Information Branch.

Fuller, A. (1996) Modern Apprenticeships Process and Learning: Some Emerging Issues, in *Journal of Vocational Education and Training*, Vol 48, No 3.

Garrison, D.R. (1992) Critical Thinking and Self Directed Learning in Adult Education, *Adult Education Quarterly*, Vol 42. No 3.

Geer, B. (Ed) (1972) *Learning to Work*. USA: Sage.

Ghererdi, S., Nicolini, D. and Odella, F. (1997) Towards a social understanding of how people learn in organisations: the notion of a situated curriculum, in *Organisational Learning*. Vol.?

Gott, S. (1995) Rediscovering Learning: Acquiring Expertise in Real-World Problem Solving Tasks, *Australian and New Zealand Journal of Vocational Education Research*, Vol 3. No.1.

Griffen, P. and Cole, M. (1985) Current Activity for the Future, in Rogoff, B and Wertsch J (Eds), *Children's Learning in the Zone of Proximal Development*. San Francisco: Jossey Bass.

Guile, D. and Young, M. (Forthcoming 1997) Learning And Learning Organisations, in Kelleher, M. and Mulrooney, C. (Eds) *Learning Around Organisations*. UK: McGraw Hill.

Hughes, E. (1958) *Men and their Work*. Chicago: Chicago Free Press.

Hughes, E. (1971) *The Sociological Eye: Papers on Work, Self and the Study of Society*. Chicago: Aldine.

Keep, E. and Mayhew, K. (1995) Training Policy for Competitiveness: Time for a New Perspective in Metclaf H (Ed) *Future Skill Demand and Supply*. PSI Publishing.

Kolb, D. (1984) *Experiential Learning; Experience as the Source of Learning and Development*. USA: Prentice Hall.

Lave, J. (1993) The Practice of Learning, in Chaiklen, S. and Lave, J (Eds) *Understanding Practice*, UK: Cambridge University Press.

Lave, J. (1996) Teaching, as Learning, in Practice in *Mind Culture and Society*, Vol. 3, No. 3 .

Lave, J. and Wenger, E. (1991) *Situated Learning*. UK: Cambridge Press.

Layton, D. (1991) Science Education as Praxis; the Relationship of School Science to Practical Action Studies, *Science Education*, Vol 19. pp. 42 -79.

Leont'ev, A.N. (1978) *Activity, Consciousness and Personality*. New York: Englewood Cliff.

Leymann, H. and Kornbluh, H. (Eds) (1989) *Socialisation and Learning at Work*. Aldershot: Avebury Press.

Marx, K (1844) Economic and Philosophical Manuscripts, in Tucker, R. (Ed) (1978) *The Marx-Engels Reader*. New York: W Norton.

Middleton, D. and Engestrom, Y. (Eds) (1996) *Cognition and Communication at Work*. UK: Cambridge University Press.

Newman, D. Griffen, P. and Cole, M. (1989) *The Construction Zone Working for Change in School*. UK: Cambridge University Press.

Noble, D. (1991) Social Choice, in Mackay, H. Young, M. and Benyon, J. *Machine Design: The Case of Automatically Controlled Tools in Understanding Technology on Education*. UK: Falmer Press.

Orr, J. (1991) Narrative at Work, in Middleton, D. and Engestrom Y. (Eds) *Collective Remembering*. UK: Sage.

Pea, D. (1993) Distributed Intelligence, in Saloman, G. (Ed) *Distributed Cognition*. UK: Cambridge University Press.

Pipan, R. (1989) Towards a Curriculum Perspective of Workplaces in Leymann, H. and Kornbluh, H. (Eds) *Socialisation and Learning at Work*. Aldershot: Avebury Press.

Pratt, D. (1992) Concepts of Teaching, *Adult Education Quarterly*, Vol 42. No 4 .

Prospect Centre (1993) *Growing and Innovative Workforce*. London: Prospect Centre.

Raizen, S. (1991) *Learning and Work: The Research Base Paper*, presented at the United States Department for Education and The Overseas Education Centre for Development Conference, Phoenix, Arizona: Linkages in Vocational Technical Education and Training.

Rogoff, B. (1990) *Apprenticeship in thinking: Cognitive Development in Social Contexts*. New York: OUP, pp 3-25.

Schon, D. (1986) *The Reflective Practitioner*. Basic Books USA.

Schribner, S. and Cole, M. (1973) Cognitive Consequences of Formal and Informal Learning, *Science*, Vol. 82..

Smith, A. (1974) *The Wealth of Nations*. UK: Penguin.

Starr, S.L. (1996) Working Together: Symbolic Interactionism, Activity Theory and Information Systems in Middleton, D. and Engestrom, Y. (Eds) *Cognition and Communication at Work*. UK: Cambridge University Press.

Streek, W. (1988) *The Social Institutions of Economic. Performance* London: Sage.

Streek, W. (1989) Skills and the Limits of Neo-Liberalism, *Work, Employment and Society*. No.3.

Tikhomirov, O. V. (1981) The Psychology of Computers, in Wertsch, J.V. (Ed) *The Concept of Activity in Soviet Psychology*. USA: Armonk, M. E. Sharpe.

Vygotsky, L.S. (1978) *Mind in Society* UK: Cambridge University Press.

Warner, M. Wobbe, W. and Brodner, P. (Eds) (1990) *New Technology and Manufacturing Management: Strategic Choices for Flexible Production Systems*. UK: Chichester Wiley.

Wertsch, J.V. (1981) *The Concept of Activity in Soviet Psychology*. USA: Armonk: M.E.Sharpe.

Wertsch, J. (Ed) (1985) *Culture Communication and Cognition: Vygotskian Perspectives* New York: CUP

Womack, J.P. Jones, D.T. and Roos, D. (1991) *The Machine that Changes the World*. New York: Harper.

Wood, S. (Ed) (1982) *The Degradation of Work? Skill, De-skilling and the Labour Process*. London: Hutchinson.

Wood, S. (Ed) (1989) *The Transformation of Work Skill Flexibility and the Labour Process*. London: Unwin Hyman.

Young, M. (1995) Post-Compulsory Education and Training for a Learning Society, *Australian and New Zealand Journal of Vocational Educational Research*. Brisbane, Australia.

Zubboff, S. (1988) *In the Age of the Smart Machine*. London: Heinemann.

¹ We define the institution of apprenticeship as the constellation of both legal and contractual rules and relations governing the status of employment, the associated workplace entitlements and the formal and informal educational processes that socialise a young worker into a workplace and occupational culture

² The concept of 'reflexive learning' is derived from the work of Beck, Giddens and Lash 1994 and is discussed in more detail in Guile and Young 1997.

³ We refer to the ideas of 'cognitive apprenticeship' (Collins et al 1989) and 'apprenticeship in thinking' (Rogoff 1991).

⁴ we are referring to the different specialisms of educational research such as comparative and vocational education.

⁵ These ideas have similarities with Dreyfuss's notion of moving from the status of a 'novice' to 'expert' within a particular profession or craft (Dreyfuss, 1986)

⁶ The term 'action-orientated' skills was first used by Zuboff to distinguish between the skills associated with traditional apprenticeships and the skill demands of workplaces transformed by the introduction of information technologies; these she referred to as 'intellective skills' (Zuboff 1988).

⁷ For example studies that have focused upon (i) the labour process and the 'meister' system (Ghererdi et al 1996); (ii) 'professional apprenticeship' and the role of the 'reflective practitioner' (Schon 1987); and (iii) integrated models of work-based and in-company training (Raizen 1990);

⁸ For example Zuboff's study of paper manufacture, banks and insurance companies (Zuboff, 1988).

⁹ In other words, it is assumed that they are transparent and unproblematic and involve mechanistic conceptions of the 'skills of transfer' as the mastery of, and re-application of, discrete skills or domains of knowledge (Bridges 1993).

