Learning through work experience

DAVID GUILE & TONI GRIFFITHS
Lifelong Learning Group, Institute of Education, University of London, 20 Bedford Way, London WC1A 0AL, UK; Education and Professional Development, University College London, Gower Street, London WC1E 6BT, UK

ABSTRACT *How students learn and develop through work experience is here analysed. We draw upon contemporary learning theory, recent developments in the adult education and curriculum theory in developing a critique of current thinking and explore how far this provides the basis for a new pedagogic model for supporting learning through work experience. We discuss the concept of 'context' and the learning which occurs within and between the different contexts of education and work and argue that most models of work experience have either ignored the influence of context upon learning or have approached this issue mechanistically. New curriculum frameworks are needed to and to allow work in all of its forms to be used as a basis for the development of knowledge, skills and identity. We present a typology of work experience which identifies models of work experience, including a model which embodies the concept of 'connectivity'. We suggest that this may provide the basis for a productive and useful relationship between formal and informal learning.*

Introduction

The aim of this paper is to reconceptualise how students, whether engaged in post-16, general or vocational education and training (VET) programmes, first, learn and develop through work experience, and second, can be supported to relate the learning which occurs within and between the different contexts of education and work. It draws upon the socio-cultural tradition within contemporary learning theory (e.g., Beach forthcoming, Cole 1995, Engeström 1996a, Lave 1993, Lave & Wenger 1991) and recent developments in adult education (e.g., Usher et al 1997) and curriculum theory (e.g., Young 1998), in developing a critique of current thinking about how students learn though work experience. Others have addressed the implications of the context of work for students' skill formation (Billet 1993, Dall'Alba and Sandberg 1996, Eraut 1999), but we are interested in recasting the relationship between the learning that occurs within and between education and work.

We begin, therefore, with a brief discussion of the concept of 'context', highlighting the need for any analysis of work experience to take account of different types of context (e.g., education and work) as well as the influence of context on the process of learning. We go on to argue that most models of work experience in general education and in VET have, in effect, either played down the influence of context upon learning or have approached this issue in a very mechanistic way. Such models have thus failed to address two issues which we argue are not only critical to developing an understanding of the process of learning in workplaces, but which are also critical to the process of learning in formal contexts (Guile & Young forthcoming(b)) They are the extent to which students have, first, to learn how to 'negotiate' their learning during work experience (Beach & Vyas 1998) and, second, be supported in relating formal and informal learning, given that knowledge, and the knowledge embedded in work roles, is unevenly distributed in workplaces (Gick 1995 and Eraut 1999).

In the light of this, we suggest that greater thought needs to be given in general education and in

VET to how to support students in relating their 'vertical development' more readily to their 'horizontal development' (Beach & Vyas 1998, Engeström 1996a). The concept of 'vertical development' is located in ideas about intellectual development which have been the cornerstone of most cognitive development theories (Gick 1995): that intellectual development consists of individual progress through a hierarchy of knowledge and skills and away from the specifics of human practice (Beach & Vyas 1998); that this movement towards greater levels of abstraction and decontextualisation constitutes the hallmark of developmental progress, distinguishing true 'development' from 'mere' learning (Gick 1995); that this type of intellectual development normally occurs through formal study in an educational context such as a school or university. By contrast, the concept of 'horizontal development', which arises from more recent developments in socio-cultural theory, refers to the process of change and development which occurs within an individual as s/he moves from one context (e.g., school) to another (e.g., a workplace). Thus, at one level, it could refer to the changes in an individual's sense of identity as a result of the experience of working in a school, factory or community centre. At another level, it could refer to the capacity to develop new mediating concepts to cope with the demands of working effectively in different organisational settings (Engeström et al 1995).

We suggest that new curriculum 'frameworks' are needed to take work in all of its forms as the basis for the development of both knowledge (historical, scientific), skills (intellectual, technical, practical and communicative) and identity (in particular, the development of the ability to act as a 'boundary crosser'). In order to clarify this suggestion, we introduce a typology of work experience, the first four models within which constitute paradigmatic examples of the types of work experience currently offered in general and vocational education. The fifth model, which embodies the concept of 'connectivity' (Young 1998), may provide the basis for a more productive and useful relationship between 'horizontal' and 'vertical' learning.

B Work experience, work and contexts for learning and development
A new agenda for work experience
Two main strands of work experience are generally discussed in the European literature (Griffiths et al forthcoming). One consists of those work experience activities commonly offered to students between 14 and 18 years in full-time education in countries which have strong 'schooling systems' (Lasonen & Young 1998), for example, Ireland and Sweden, or 'mixed' systems, for example, the UK. The other strand is apparent in those countries with strong VET systems which offer apprenticeships as an alternative to general education as a clear education and training pathway for young people (Lasonen & Young 1998). These include Denmark, Germany and Austria, where work experience has a much longer history as part of such programmes. In the case of VET, discussions have tended to concentrate upon the contribution which work experience can make to the development of occupational competence and occupational identity (Vickers 1995, Stern & Wagner 1999a). In the case of general education, they have tended to focus upon the extent to which work experience can assist students in their transition to the labour market and in learning how to become independent adults (Miller et al 1991). More recently, work experience has sometimes been offered as part of an alternative route for those young people who are socially excluded with neither employment nor full-time education and training available to them. This includes initiatives such as the New Deal in the UK and the Leaving Certificate Vocational Programme (LCVP) in Ireland, which often incorporate work experience as part of an overall strategy to improve the employability of young people.

Recent EU policy indicates a reassessment both of the relationship between work and education and the role of work experience in academic and vocational programmes, on the basis that 'globalisation' is generating the need for new learning relationships between education and work which will support lifelong learning (EC 1995). Thus, in the case of work experience in both general and vocational education, it is now envisaged that it could fulfil an important new role, providing an

opportunity for those young people in full-time education and training to develop their understanding about changes in the 'world of work', to enhance their key skills and to make closer links between their formal programmes of study and the world of work (Green et al 1999).

However, although there has been more recognition of the need for new learning relationships between education and work and a new agenda for work experience, there has been much less discussion of the extent to which the actual context of work may affect learning and development. Most of the EU and North American research literature (Miller et al 1991; Stern & Wagner 1999a) and the EU policy literature (EC 1995, 1997) has tended, and is still tending, to adopt a narrowly functional view of the relationship between education and work. Accordingly, it has perpetuated the idea that the work contexts of work experience are stable and transparent environments in which students can easily learn and develop. Up to a point, this is, of course, a useful approach: it enables the development of models for the delivery of work experience based upon the creation of management arrangements between educational institutions and workplaces (Griffiths et al 1992, Miller & Forrest 1996, Stern & Wagner 1999a). This encourages schools, colleges and other intermediary agencies to manage the arrangements between education and work more effectively and to ensure that essential health and safety considerations are satisfactorily addressed (Peffers, Griffiths& Romain 1997). However, whilst it was previously reasonable to assume a fairly stable work environment, this assumption is now questioned by the unprecedented pace at which global economic pressure, coupled with developments in communication and information technology, is forcing continuous change in that environment and resulting in a polarisation between 'knowledge-rich' and 'knowledge poor' organisations (Guile forthcoming).

The potential of these continuously changing work contexts for learning and for higher-order skill development is considerable. However, it involves re-thinking how students can be supported to relate their 'vertical development' and 'horizontal development' - by addressing the institutional separation of these modes oflearning and by taking more account of the influence of context upon learning.

'Horizontal' and 'vertical' development
The tendency to treat 'vertical development' in isolation from 'horizontal development' reflects the institutional separation of formal from informal learning. This separation has been a feature of most academic communities for many years (Bourdieu 1988) and is also evident in the education policy priorities and hence national systems of education and training in most EU countries (Green et al 1999). Formal learning takes precedence over other types of learning on the understanding that it provides the foundation of systematic knowledge about human activities and practices (Young 1998). Curricula in most schools, colleges (Lasonen 1997) and universities (Bourdieu 1988) within the EU have been organised through the classification and framing of discipline-based knowledge.

As Bernstein (1982) has highlighted in relation to general education, the organisation of curricula has historically rested upon the existence of a strong form of classification and framing of subjects. In other words, education and training systems have emphasised pedagogic approaches which support the study and assessment of subjects in isolation from one another as well as the separation of academic subjects from practical contexts. The general separation of 'vertical' from 'horizontal' development accentuates for students the problem of trying to relate them. To some extent, a similar situation exists in relation to vocational education. Bodies of knowledge and types of skill have often been viewed as separate and bounded entities which can be taught independently of their actual, practical application (Engeström and Gronin forthcoming). However, there has been slightly greater recognition of the role of a workplace supervisor (meister) in assisting students in finding a link between formal learning and workplace learning (Brown et al 1994).

The challenge of assisting students to relate their 'horizontal' development to their 'vertical'

development therefore involves overcoming the limitations of the 'technical-rational' model of education and training (Ellstrom 1997). Instead of viewing them as separate and distinct, there is a need to develop curricula frameworks which encourage students to make links between work experience, its underlying knowledge and skill and its context (cultural, social, technological).

The context of work
One of the main reasons why the work experience literature has tended to overlook the potential influence of the context of work upon learning and development in general is that 'context' has been interpreted in a very specific way, as a definition of a pre-given object or condition or set of objects or conditions (Cole 1995). This interpretation of context is consistent with how the term is employed in such fields as Business Economics (Boisot 1995), Strategic Management (Bartlett and Ghoshal 1993), Labour Market Economics (Regini 1995) and Political Economy (Keep & Mayhew 1999). This perspective enables social scientists to analyse the implications of the changes which may be occurring in different types of work context - as the following examples illustrate.

First, changes in organisational context are leading to the emergence of new forms of work and job design. These are based on less Fordist and Tayloristic models of work relationships and therefore provide workers with broader based forms of responsibility and opportunities to learn and develop (Brown & Lauder 1995). Second, changes in the context of production are prioritising the management, acquisition, sharing and utilisation of knowledge to support business performance (Scarborough et al 1999). Third, changes in the context and nature of work have resulted in the emergence of considerably expanded definitions of skill (Coffield 1998). Such definitions now include traditional definitions (technical and craft skills), recent enhancements to traditional definitions (such as key/core skills like problem solving) and quite radically different conceptions of skill which reflect motivational traits and cultural dispositions (Guile, forthcoming).

Viewed from this perspective, the prime purpose of work experience would appear to be to provide an opportunity for students to learn about another context (the workplace) and to learn what 'skills' (e.g., teamwork) may support their future employability. This, of course, is useful. Recent research into the use of work experience as part of apprenticeship programmes (ref) and post-16 education (Granville & Reilly, forthcoming) has demonstrated that work experience can provide valuable insights into economic and technological change. However, we question whether these examples are sufficient as an expression of the learning potential of work experience. Instead of viewing work solely as a context which students learn about, it is important to appreciate that work, like education, is a context through which students can learn and develop. This shift of focus directs our attention to how individuals learn, grow and develop through the strength and richness of their interactions and applications within and between different contexts.

Work as a context for learning and development
Over the years, most theories of human development have focused upon the individual as the main unit of analysis and thus concentrated upon the individual's response to external stimuli in tracking development (Kindermann & Skinner 1992). Cole (1995), however, has noted the importance of the reappraisal of the work of John Dewey (1981, 1986 and 1988) and the growing influence of the Russian cultural-historical school of psychology influenced by the work of Vygotsky (1978).

Cole argues that Dewey's ideas are important to contemporary thinking about human development because they provided a way of understanding the 'intimate linkages' between students' cognition and the contexts in which it takes place and because they emphasised the importance of not separating events and circumstances from their contextual whole. As Dewey observed, 'in actual experience, there is never any such isolated object or event, an object or event is always a specific part, phase, or aspect, of an environment experienced world' (Dewey 1986). Thus, from Dewey's perspective, context is not fixed, well-defined and stable but is shaped by the relationships between

people, their activity and the social world of which they form part. Cole notes that Vygotsky's work both complements and extends the Dewyian tradition, observing that one of Vygostky's most important contributions was to offer a way of overcoming the dualism of the individual and society.

By placing the idea of mediation at the centre of the learning process, Vygotsky reconceptualised learning as a 'complex mediated act', a triad involving the subject (the individual), the object (the task or activity) and mediating artifacts (e.g., communication and information technologies, books). The inclusion of cultural artifacts was deeply significant, emphasising that individuals could not be understood in isolation from their context and its enabling 'means' and that society could not be understood without taking into account the agency of individuals who use and produce those means (Engeström 1996b). Over the years, Vygotsky's ideas have been further developed. Thus, Cole suggests that, although they offer slightly different interpretations of Vygotsky, the ideas of situated learning (Lave & Wenger 1991) and activity theory (Engeström 1996b) have contributed to broadening the debate about the relationship between context, mediation and human development. We identify, below, how these theories offer different, but complementary, insights into the process of learning through work experience.

Lave and Wenger (1991) have demonstrated how the process of 'legitimate peripheral participation' in fairly stable and well-bounded 'communities of practice' enables individuals to acquire knowledge and skill and develop their understanding through contact with more experienced others. This raises the question of how easily students gain access to and operate in such work contexts. A recurring assumption in the general education and VET work experience literature is that this happens ipso facto. However, this neglects the extent to which participating in a 'community of practice' can be highly problematic. As Ghererdi et al (1998) have observed, it requires 'host' organisations actively to provide opportunities for learners to observe, discuss and try out different practices with members of the 'community' they have temporarily joined.

Participating in workplace 'communities of practice' therefore raises serious questions for the providers of work experience: first, the extent to which the 'host' organisation enables students to participate in interacting with more knowledgeable others in the workplace 'zone of proximal development' may well depend upon its Human Resource Development strategy (Guile forthcoming). Second, it means that education and training
providers of work experience have to recognise that students need to learn in ways different to those in which they learn in school or college (Beach & Vyas 1998). Beach and Vyas have suggested three forms of learning with which students need to engage: 'learning on the fly' (i.e., making requests for help), 'learning by collaborating' (i.e., working, talking to and undertaking 'low risk' and 'stretching' activities alongside a more experienced person) and 'learning by observing'. They conclude that students do not easily accomplish these methods of learning, partly because these types of 'horizontal development' are not easily reconciled with conventional ideas about 'vertical development' and run counter to their experiences within school.

In contrast, Engeström has concentrated on analysing how learning occurs in work situations that are not necessarily stable and well-bounded (Engeström et al 1995, Engeström et al 1996). His basic unit of analysis is the idea of an 'activity system', in other words, the complex interrelations between the individual and different workplace 'communities' or 'networks' that are influenced by the division of labour and workplace rules and procedures. Engeström argues that increasingly workers are expected to act as 'boundary crossers' between 'activity systems', in other words, to possess the ability to contribute to the development of new forms of social practice and to produce new forms of knowledge. According to Engeström, this entails learning how to contribute to the transformation of work contexts, an issue rarely raised in the work experience literature. Lave and Wenger and Engeström's ideas suggest that new questions should be asked about how students learn through work experience provided as part of their general education or VET. It is thus important to explore

how work experience can provide (i) a context for participating in 'communities of practice' and learning how to develop the ability to act as a 'boundary crosser' and (ii) a means of re-examining and re-forming the relationship between work experience and formal programmes of study.

C   New approaches to work experience
Models of work experience
In this section, we discuss different approaches to or models of work experience which embody changing responses to policy, to the learner, to skills needed and to pedagogy. The first four models reflect the influence of different economic, technological and social factors prevailing within European countries as well as different ideas about learning and development. Based upon the preceding analysis, we identify criteria to help us differentiate between the characteristic features of each model Ŵ and they can be viewed as part of an evolving continuum of learning through work experience. Although the models may be specific to different periods of economic and technological development and reflect changing educational ideas about the process of learning, they can and do co-exist in different countries. They are analytical rather than descriptive; no specific work experience programme fits neatly into any of the models and some programmes may contain elements of more than one model. The fifth model presents a new approach to work experience which is based upon the principle of connectivity. It displays innovatory features which are relevant to future approaches to effective learning through work experience. The following typology groups the models as:
Model 1 Ŵ the traditional model
Model 2 Ŵ the experiential model
Model 3 Ŵ the generic model
Model 4 Ŵ the work process model
Model 5 Ŵ the connective model
and they are described in more detail in the sections which follow.

DIAGRAM TO BE INSERTED ON THIS PAGE

The traditional model of work experience: 'launching' students into the world of work
The legacy of the technical-rational perspective on education and training is evident in the models of work experience traditionally associated with apprenticeship schemes and general education throughout Europe. Until relatively recently, a prime aim of apprenticeship-based work experience programmes was to mould and adapt students' skills in workplaces (Vickers 1995, Stern & Wagner 1999a, 1999b). By contrast, the school-based work experience schemes introduced in the UK in the 1970s tended to assume that students would unconsciously or automatically assimilate relevant workplace knowledge, skills and attitudes and internalise the implications of occupational changes occurring in the workplace (Watts 1983).

This emphasis upon both adaptation and assimilation in the traditional model of work experience is a distinctive feature of a technical-rational perspective on education and training. Students engaged in work experience have often been viewed as 'containers' (Lave 1993) into which various forms of social interaction can be 'poured' and it has been assumed that knowledge and skills can be taught quite separately from the context of their use.

These assumptions about learning are consistent with what Kindermann & Skinner (1992) have termed a 'launch' perspective on the relationship between people and their environment. In other words, it is the initial learning situation (school, college or vocational training centre) which largely determines what a person will do in a new situation: the earlier learning determines the trajectory of later learning, with the environmental influence being fairly minimal. Thus, from this perspective, the prime purpose of traditional models of work experience has been to 'launch' students into the world of work

Conceptualising work experience simply as 'launch', however, leaves little incentive to develop a theory of how students learn and develop through work experience and this has helped to maintain the divisions between formal and informal learning and academic and vocational education (Lasonen & Young 1998). As a revealing study by McNamara (1991) has elaborated in schematic form, it is not possible to reform the 'launch' model of work experience by trying to reform the content of the formal (VET) component of learning alone.

The experiential model: work experience as 'co-development'
During the second half of the 20th. century, many educationists turned to the work of Dewey (1981, 1986, 1988) for a philosophical basis for a curriculum critique of technical rational assumptions about education and training. But, as Prawat has noted (1993), many American and European educationists have interpreted Dewey's important ideas rather narrowly as an expression of the idea that all stages and phases of education should be made 'relevant' to students and that there should be a more problem-based approach to education and greater use of inquiry-based models of teaching and learning. There has therefore been considerable interest in the psychology of education (Resnick 1987), curriculum studies (Michaels & O'Connor 1990) and adult education (Kolb 1984) literature in the extent to which the idea of practical problem-solving and experiential learning can serve as a strategy to promote higher order thinking.

In the case of work experience programmes, certain versions of experiential learning, specifically those based on Kolb's idea of the experiential 'learning cycle', were perceived in general education as providing a useful framework for understanding how students learn through work experience (Jamieson et al 1988, Miller et al 1991). One consequence of adopting this slightly broader perspective on work experience was that it placed the idea of a student's interpersonal and social development at the forefront of the agenda for work experience (Miller et al 1991, Wellington 1993). Two ideas lay behind this interest: first, it reflected certain educational aims, such as a desire to equate the value of learning more clearly with its practical applications (Watts 1991). Second, it reflected a growing policy interest across Europe in establishing education-business partnerships in order to assist students to adjust themselves more easily to the ever-changing demands of the labour market (Griffiths & Guile 1998, Stern & Wagner 1999b).

Re-thinking the purpose of work experience in order to take more explicit account of the actual trajectory of a student's development has led to greater dialogue and cooperation between education and workplaces. In many ways, it reflects Kindermann & Skinner's notion of 'co-development' between interested parties (1992). A gradual re-thinking of the principles of work experience along the above lines took place from the late 1980s in various European countries. Some of these schemes and, for that matter, some schemes in the USA (Stern & Wagner 1999b), as well as certain approaches to work experience introduced in the UK through the Technical and Vocational Education Initiative (TVEI), began to take greater account of the process of student development.

This led to greater interest being displayed in three areas: first, the need for educational institutions or intermediary agencies, such as education-business partnerships, to negotiate clear objectives for students, workplaces and schools/colleges in advance of the work experience (Griffiths et al 1992, Miller et al 1991); second, the development of new pedagogic practices to assist students in identifying, possibly through the use of a de-briefing process after the work experience, the influence of the experience on personal and social development (Watts 1991); third, the long term benefit of evaluating work experience in order to identify how the work experience might have affected subsequent motivation and performance in school or college.

However, despite this fresh thinking about the purpose of work experience in general education, the mainstream curriculum in most EU countries was left broadly unaffected, with work experience

effectively kept separate from it. Equally, the whole question of the relationship between theoretical study and work experience, even in countries with strong apprenticeship systems, was also left unresolved.

The generic model: work experience as an opportunity for key skill assessment
One of the main educational debates in Europe in the late 1980s and early 1990s concerned the attempt to promote a greater sense of learner autonomy and self-discipline, particularly in low-attaining students, within general and vocational education programmes (Green et al (1999). These developments have led, in the UK in particular and to a lesser extent in certain parts of Europe, to the emergence of what may be referred to as a 'generic' perspective on learning. By and large, this perspective is based on the idea that it is, first, more liberalising and egalitarian to adopt a system which attaches prime importance to the 'outcome', the result, and does not prescribe the form of learning necessary to gain a qualification (Jessup 1990). Second, that an agreed series of common outcomes can be identified for any programme of study and on that basis it is possible to assess the learning that has occurred (Kamarainen & Streumer 1998).

In the UK, the notion of 'learning outcomes' has been associated with attempts to shift the emphasis away from traditional curriculum concerns with structure, content, and teaching 'inputs' towards actual outcomes (Young 1998). They have been viewed as a method that can be used to assist individuals to capture their own experiences and present such experience for accreditation (Ecclestone 1998; Usher et al 1997). Certainly, the notion of 'learning outcomes' has been subject to considerable criticism in the UK for its highly behaviourist and superficial assumptions about the process of human development and learning (Ecclestone 1998, Hyland ????), as well as the assumption that neutral judgements can be made about the extent to which experience is equivalent to understanding or the development of occupational capability (Jones & Moore 1995).

Nevertheless, 'learning outcomes' have gradually become an accepted part of 16-19 vocational education and training in the UK. The Qualifications and Curriculum Authority (QCA) has issued very specific guidance to schools and sixth-form colleges about the framing, definition, setting out and assessment of learning outcomes in relation to pre and post-16 work experience (QCA 1998). Furthermore, 'learning outcomes' are used within the UK's Modern Apprenticeship programme in order to provide evidence of the learning, which apprentices may present for formal or informal accreditation, that has occurred during work experience (Fuller 1996).

As a result, strong emphasis has been placed in post-16 education upon a particular interpretation of student-centredness related to student autonomy and independence. In the case of work experience, this has been interpreted as planning a work experience placement and managing and evaluating the learning through the use of statements about 'learning outcomes' (Miller 1996, Oates & Fettes 1997). This approach to learner-centredness requires learners to formulate their own personal action plans for work experience. The plan serves as a type of contract between the individual, the workplace and the educational institution, thus facilitating student self-assessment and external verification of key skill development within a workplace, albeit in a rather narrow and mechanistic way (Ecclestone 1998).

In theory, the use of action plans generates a new role for teachers. They are required to assist students in assembling portfolios of evidence for assessment at a later stage. However, all too often, this consists of the application of a specific set of methodological procedures designed to facilitate the recollection of experience (Usher et al 1997). By virtue of the procedures having generally been derived from a meshing of the Kolb learning cycle and behavioural learning outcomes, they are assumed to be constant across all contexts and capable of guaranteeing the authenticity and validity of the experience (Ecclestone 1998, Usher et al 1997).

However, the idea of teacher/trainer-facilitated reflection is complex. First, it involves awareness of the assumptions (i) that 'experiential learning' is a natural category and (ii) that that the 'voice' of an individual or community constitutes in some way authentic knowledge of a situation. As Moore & Muller (1999) argue, the idea of 'experiential learning' and 'voice discourses' are themselves endowed with theoretical assumptions (in the present case, about how learners can be helped to make sense of their inter-subjective experience). Accordingly, the meaning and significance of experience depends not only upon the experience as such but also on how and by whom it is interpreted (Brah & Hoy 1989).

Second, it involves those in education or workplaces with responsibility for supporting the process of learning exploring with learners the extent to which experience is influenced by the constraints of its context. As Young and Lucas (1999) argue, this is likely to involve the use of concepts to provide a theoretical framework in which learners can reflect critically upon their experience. Eraut (1999) observes that, in order to use a scientific concept in a practical situation, it has to be transformed or resituated in a firm which fits the context. This is not a process of logical reasoning but rather of 'mulling over' the situation until 'something seems to fit'.

Thus, concepts and theories can be introduced to the learner by the teacher or trainer and deepened through conversation in order to facilitate the process of reflection. Moreover, as Prawat (1993) argues, 'ideas serve to educate attention'. In other words, learners need to be immersed in ideas as well as in the world of experience and it is the process of mediation that provides learners with a basis for connecting their context-specific learning with ideas or practices which may have originated outside those contexts.

The work process model
As stated at the outset, the aim of this paper has been to reconceptualise how students, whether engaged in post-16 general or vocational education and training programmes both learn and develop through work experience and also can be supported to take explicit account of the learning which occurs within and between the different contexts of education and work. Various attempts have been made, especially in the TAFE system in Australia (Billet 1993) and the 'dual system' in Germany (Attwell & Jennes 1993), to take greater account of the influence of the context of work upon learning and to avoid affording unmediated 'experience' a privileged place in work experience programmes. These attempts have not, however, gone very far in developing a curriculum framework which enables students to relate formal and informal learning.

One response to the classic problem of division between formal and informal learning has emerged from within the German VET tradition. The term, 'inert knowledge', has been employed to describe types of formal knowledge which have been taught to apprentices but which have not proved useful in practice, even though the knowledge itself may be relevant to work practices. Consequently, the concept of 'work process knowledge' has been introduced to assist apprentices and teachers in overcoming the dilemma of 'inert knowledge' (Kruse 1996). Work process knowledge has been defined as understanding the labour process in terms of the following dimensions: 'product-related, labour organisational, social ecological and systems-related' (Kruse 1996). The main distinguishing feature of the concept of 'work process knowledge' is that it draws attention to the importance of situating work practices in the actual context of the labour process. Thus, it has been argued that work process knowledge is fundamental to a VET curriculum. Apart from developing formal elements of a programme of study, including work experience, to assist the student in understanding individual tasks, activities or behavioural expectations, it has also been recognised that it is vital to develop a broader understanding of the actual work context (and hence employability). As Fischer and Stuber (1998) have argued, this combination of theoretical and practical learning prepares apprentices to engage more rapidly with new organisational forms of production and enables them to move into alternative work environments more easily.

The prime purpose of work experience, from this perspective, would be to help students adjust themselves more successfully to the changing context of work through the opportunity to participate in different communities of practice. The idea of 'attunement' recognises that the development of any individual is affected by the task or activities which he or she is asked to undertake in a specific context and that the context, in turn, is also affected by their development (Kindermann & Skinner 1992). A key concern, therefore, is to ensure that students learn about the context in which they are working and are presented with opportunities to learn and develop within that context by adjusting or varying their performance as required. Only on this basis, it is claimed, will students fully develop the capacity to transfer the knowledge and skill gained in one work context to another. Attwell and Jennes (1996), however, have argued that work experience will not by itself promote work process knowledge and that it needs to be mediated Ŵ perhaps by the introduction of concepts, perhaps by subject knowledge Ŵ and that the process of mediation may take place within the workplace and company-training centres. They conclude, in relation to the German VET programmes, that these programmes will have to be further evolved to help students connect formal and informal learning more explicitly. They do not, however, provide any explicit guidance on how to achieve that objective, other than suggesting that students need to be coached to 'reflect-on' and 'reflect-in' action.

A connective model of work experience

Thus far, we have argued that, although each of the foregoing approaches has their own strengths, they are all beset by different weaknesses. We now go on to consider an alternative model of work experience - the connective model. This model is based upon the idea of a 'reflexive' theory of learning (Guile & Young forthcoming (a)) which involves taking greater account of the influence of the context and the organisation of work upon student learning and development, the situated nature of that learning and the scope for developing 'boundary crossing' skills. It also entails developing new curriculum frameworks which enable students to relate formal and informal, horizontal and vertical learning. From this perspective, learners need to be encouraged to conceptualise their experiences in different ways and for this conceptualisation to serve different curriculum purposes. This is very similiar in intention to what Freire has defined (Freire & Macedo 1999) as the role of the teacher - to create 'pedagogical spaces', in other words, to use his/her expertise to pose problems in order to help learners analyse their own experiences and arrive at a critical understanding of their reality.

We employ the term, connectivity, to define the purpose of the pedagogic approach which would be required in order to take explicit account of the vertical and horizontal development of learners. Supporting students to understand the significance of these two dimensions of development constitutes a pedagogic challenge, albeit a rewarding one, for teachers in educational institutions as well as those with responsibility for development in the workplace. It involves encouraging students to understand workplaces as a series of 'interconnected activity systems' (Engeström forthcoming) which consist of a range of 'communities of practice' (Lave & Wenger 1991, Wenger 1998). In addition, it involves teachers and workplaces appreciating that work experience provides a range of very different ways of learning compared with how students normally learn in school (Guile and Young forthcoming (a)). Consequently, learners, teachers and workplaces need to ensure that work experience provides an opportunity for learners to 'learn to negotiate how they learn' in workplaces since this is critical to effective workplace performance (Beach & Vyas 1998) as well as to learn the new capabilities that are gradually being required in 'high-performance' workplaces (Guile & Fonda 1999). For example, work experience can provide an opportunity to develop the personal, social and behavioural skills that support personal and organisational learning. This type of 'horizontal development' goes far beyond what is usually referred to as key skill development since it is not simply concerned with problem-based 'know-how'.

Thus, learners will need to be supported to appropriate concepts acquired through vertical development, and which are external to the context, to mediate the relationship between their formal programmes of study and, for example, trends in labour and work organisation. They not only have to develop the capacity to participate within workplace activities and cultures; they must also learn how to draw upon their formal learning and use it to interrogate workplace practices. Eraut (1999) suggests that this could involve: use of prior knowledge, seeing the relevance of concepts, resituating the concepts and integrating the new knowledge.

These ideas about learning through work experience reflect our earlier comments that 'host' organisations ought to consider how they can provide 'environments for learning' (or opportunities to participate in 'communities of practice') if they are to maximise the learning potential of these activities for themselves and for learners. This implies a reappraisal of human resource development strategies, as well as management and developmental practices, by 'host' organisations and of pedagogic practice by teachers, since students and workers have to learn how to enter unfamiliar territory and work collaboratively in different communities of practice (Guile & Fonda 1999).

The implications of the above re-conceptualisation of work experience are evident in relation to the question of the 'transfer of learning'. The concept of transfer has traditionally rested upon the idea that learning simply consists of acquiring knowledge and skill in one context (a workplace) and reapplying it in another (another workplace). This concept lies at the heart of the UK and EU debate about key skills and key competencies. The main problem with this conception of skill and transfer is that it completely neglects the influence of context, resources and people upon the process of learning and, as Engeström et al (1995) argue, misconceives the process of transfer. Once workplaces are viewed as 'activity systems', with their own divisions of labour, rules and procedures, it is possible to replace the notion of 'transferability' with the concept of 'boundary crossing'. This reflects the recognition that students engage successfully in different tasks and in different contexts by demonstrating what Reder (1993) has referred to as 'polycontextual skills'. Such an approach takes account of the fact that learning is a process both of self-organisation and enculturation (Cobb 1999) and that these processes occur while individuals participate in cultural practices, frequently while interacting with more knowledgeable others in workplace 'zone of proximal development'. At one level, learning through work experience 'calls for the formation of new mediating concepts' that assist learners in developing the forms of social interaction that support dialogic problem solving. In this sense, as Engeström et al further argue, 'boundary crossing may be analysed as a process of collective concept formation'. At another level, it involves learners in functioning as 'connective specialists' (Young 1998), using specialist knowledge and skill acquired in formal education to understand why certain types of performance are required in different work contexts and how to work with others to produce new knowledge. Thus, teaching and learning become more a product and process of interaction within and between contexts and the successful mediation of these relationships is based upon a recognition that learning involves the negotiation of learning as part of actual workplace experience. Some of these issues are currently being explored through a series of case studies in a research project undertaken under the EC Fourth Research Framework: 'Work experience as an education and training strategy: new approaches for the 21st. century (Griffiths & Marhuenda forthcoming).

D   Conclusion

This paper has analysed how students, whether engaged in general or vocational education and training programmes, learn and develop through work experience. We have argued that studies of work experience have tended not to address this issue but have, rather, perpetuated the idea that the actual work contexts within which work experience takes place are stable, unchanging, transparent environments in which students can easily learn and develop. We have therefore addressed the concept of 'context' as the starting point for considering learning through work experience and have

argued that any analysis of work experience should take account of the following issues: first, the different types of context (e.g., education and work), different strategies within contexts and the influence of context on the process of learning; second, the extent to which students have to learn how to 'negotiate' their learning during work experience; and, third, the extent to which students must be supported to relate formal and informal learning, given that knowledge is unevenly distributed in workplaces. We have argued that most models of work experience have in effect either ignored these issues or have at best approached them in a very mechanistic way. On the basis of this analysis, we develop a typology of five models of work experience Ŵ the traditional model, the experiential model, the generic model, the work process model and the connnective model. These different models embody changing responses to policy, to the learner, to skills needed and to pedagogy and reflect the influence of different economic, technological and social factors prevailing within European countries as well as new ideas about learning and development. Thus, we suggest that they can be viewed as part of an evolving continuum of approaches to learning through work experience. We suggest that the fifth model Ŵ the connective model Ŵ provides a new curriculum framework that can take work in all its forms as the basis for the development of knowledge (historical, scientific), skills (intellectual, technical, practical and communicative) and identity (in particular, the development of the ability to act as a 'boundary crosser'). We suggest that this 'connective model' of work experience may provide the basis for a more productive and useful relationship between formal and informal learning since it addresses how work experience can enable students to take explicit account of the learning which occurs within and between the different contexts of education and work.

Words: 7343 (including diagram)
January 2000

REFERENCES

Attwell, G. and Jennes, A. (1996) Work process knowledge and new forms of development of professionals for Vocational Education and Training, Paper at Third Work Process Knowledge Meeting, Bremen, Dec. 12-14

Bartlett, C. and Ghoshal, S. (1993) 'The Changing Role of Top Management', Harvard Business Review, May/June pp. 90-96

Beach, K. (forthcoming) 'Consequential Transitions: a sociocultural expedition beyond transfer in education', Journal of the Learning Sciences

Beach, K. and Vyas, S. (1998) Light Pickles and Heavy Mustard: Horizontal development among students negotiating how to learn in a production activity, paper presented at the Fourth Conference of the International Society for Cultural research and Activity Theory, University of Aarhus, Denmark.

Bernstein, B. (1982) 'Codes, modalities and the process of cultural reproduction: a model' in Apple, M. (ed.) Cultural and Economic Reproduction in Education, London, Routledge and Kegan Paul

Billet, S. (1993) Authenticity and a culture of practice within modes of skill development Australian and New Zealand Journal of Vocational Education Research 2(1), pp1-29

Boisot, M. (1995) Information Space, London: Routledge

Bourdieu, P. (1988) Homo Academicus, Stanford, CA: Stanford University Press

Brah, A. and Hoy, J. (1989) 'Experiential learning: A new orthodoxy' Weil, S.W. and McGill, I., eds., Making sense of experiential learning Milton Keynes: SRHE/Open University Press

Brown, A., Evans, K., Blackman, S. and Germon, S. (1994) Key Workers: Technical and Training Mastery in the Workplace, Poole: Hyde Publications

Brown, P. and Lauder, H. (1995) 'Post Fordist Possibilities: Education, training and national development' in Bash, L. and Green, A., eds. Youth Education and Work, World Yearbook of Education London: Kogan Page.

Burke, J., ed. (1995) Outcomes, Learning and the Curriculum London: Falmer Press

Cobb, P. (1999) 'Where is the Mind?' in Murphy, P. (ed.) Learners, Learning and assessment, London: Sage Publications

Coffield, F., ed. (1998) Learning at Work, ESRC 'Learning Society' Research Programme University of Bristol: The Policy Press

Cole, M. (1995) 'The Supra-Individual Envelope of Development: Activity and Practice, Situation and Context' in Goodnow, J.J., Miller, P. and Kessel, F. (eds) Cultural practices as contexts for development San Francisco: Jossey Bass

Dall'Alba, G. and Sandberg, J. (1996) 'Educating for Competence in Professional Practice', in Instructional Science, 24, 3: 411-437

Dewey, J. (1988) 'The Quest for Certainty' in Boydston, J.A.,ed. John Dewey: the Later Works 1925-1953, Vol 4 Carbonadale: Southern University Press

Dewey, J. (1986) 'Logic. The Theory of Inquiry' in Boydstone, J.A., ed. John Dewey: the Later Works, 1925-1953, Vol 12 Carbonadale: Southern University Press

Dewey, J. (1981) 'Experience and nature' in Boydstone, J.A., ed. John Dewey: the Later Works, 1925-1953, Vol 1 Carbonadale: Southern University Press

Ellstrom, P-E (1997) 'The Many Meanings of Occupational Competence' in Brown, A., ed. Promoting Vocational Education and Training: European Perspectives, Hameenlinna: Finland

Ecclestone, K. (1998) 'Empowering or Ensnaring? The Implications of Outcomes-Based Assessment' in Higher Education Quarterly, 53, 1 pp. 29-49

Engeström, Y (forthcoming) Expansive Learning at Work: Toward an activity-theoretical reconceptualisation.

Engeström, Y (1996a) 'Development as breaking away and opening up: A challenge to Vygotsky and Piaget', Swiss Journal of Psychology, 55 126-132

Engeström, Y. (1996b) 'Developmental work research as educational research', Nordisk pedagogik, Vol 16 131-143

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

Engeström, Y. and Gronin, T. (forthcoming) Transfer and Boundary Crossing.

Engeström, Y., Virkkunen, J., Helle, M., Pihlaja, J. and Poikela, R. (1996) 'Change laboratory as a tool for transforming work', Lifelong Learning in Europe, Vol 1 No 2 10-17

Engeström, Y., Engeström, R., and Karkkainen, M. (1995) 'Polycontextuality and boundary crossing in expert cognition: Learning and problem solving in complex work activities' Learning and Instruction 5. 1. pp. 319-366

Eraut, M. (1999) Learning in the workplace Ŵ a framework for analysis. Paper presented at the EARLI Conference on Working and Learning.

EC (1997) Learning in the Information Society: Action Plan for a European Initiative, Brussels: EC

EC (1995) Teaching and Learning: Towards the Learning Society, Brussels: EC

Fischer, M. and Stuber, F. (1998) 'Work process knowledge and school-to-work transition' in Scherer, E., ed. Shop Floor Control: A Systems Perspective Berlin: Springer Verlag

Friere, P. and Macedo, D.P. (1999) 'Pedagogy, Culture, Language and Race: A dialogue' in Leach, J. and Moon, B. (eds.) Learners and Pedagogy, London: Sage Publications

Fuller, A. (1996) 'Modern apprenticeships process and learning: some emerging issues', in Journal of Vocational Education and Training, 48.pp. 3: 229-248

Ghererdi, S., Nicolini, D. and Odella, F. (1998) 'Towards a social understanding of how people learn in organisations: the notion of a situated curriculum', in Management Learning, 20. 2.

Gick, J. (1995) 'Intellectual and Manual Labour' in Martin, L., Nelson, K. and Torbach, E. (eds.) Socio-cultural psychology; theory and practice of doing and knowing, New York: Cambridge University Press.

Green, A., Leney, T. and Wolf (1999) Convergence and Divergence in European Education and Training Systems, London: Bedford Way Papers, Institute of Education, University of London

Griffiths, T., Benke, M., Guile, D., Herlau, H., Madsen T., Marhuenda, F., McKenna, P. (forthcoming) Work experience as a strategy for learning in Europe

Griffiths, T. and Guile, D. (1999) 'Pedagogy in work-based contexts', in Mortimore, P., ed., Understanding pedagogy and its impact on learning, London: Sage Publications

Griffiths, T. and Guile, D. (1998) Education for All, Brussels: Education Business Network for Social Cohesion

Griffiths, T. and Marhuenda, F. (forthcoming) 'Interpretation of the relevance of work experience for future-oriented educational strategies as a challenge for research' in Qualifications, Competences and Learning Environments for the Future: European Reference Publication, Thessaloniki: CEDEFOP

Griffiths, T, Miller, A and Peffers, J, eds. (1992) European Work Experience: Principles and Practice, Centre for Education and Industry: University of Warwick,

Guile, D. (forthcoming) Work, Organisational Change and Work Experience: the question of employability within the European Labour Market

Guile, D. and Fonda, N. (1999) Managing Learning for Added Value London: Institute of Personnel and Development

Guile, D. and Young, M.F.D. (1999) 'Beyond the institution of apprenticeship: towards a social theory of learning as the production of knowledge' in Rainbird, H. and Ainley, P. (eds.) Apprenticeship: Towards a new paradigm of learning, London: Kogan Page

Guile, D. and Young, M.F.D. (forthcoming (a)) Learning organisations and the question of learning

Guile, D. and Young, M.F.D. (forthcoming (b)) Transfer and transition between education and work: some theoretical questions and issues

Harris, A. (1997) 'Equipping young people for working life: the workplace versus the school', Economic Awareness, January: 3-5

Jamieson, I., Miller, A. and Watts, A.G. (1988) Mirrors of Work, Brighton:Falmer Press

Jessup, G. (1990) Outcomes: NVQs and the emerging model of education and training Brighton: Falmer Press

Jones, L. & Moore, R. (1995) 'Appropriating competence: the competency movement, the New Right and 'culture change' project', British Journal of Education and Work, 8.2. pp.78-93

Kamarainen, P. & Streumer, J. (1998) Curriculum Development, New learning environments, and transfer of innovations in Europe in CEDEFOP Vocational Education and Training Ŵ the European research field. Background Report 1998 Vol II CEDEFOP, Thessaloniki, Greece

Kindermann, T. and Skinner, E.A. (1992) 'Modeling environmental development: individual and contextual trajectories' in Asendorpf, J.B. and Valsiner, J., eds., Stability and change in development London: Sage

Kruse, R. (1996) Work process knowledge and quality of vocational training Paper given at the Third Work Process Knowledge Meeting, Bremen, Dec 12-14

Lasonen, J., ed. (1997) Reforming Upper Secondary Education, University of Jyv skyl Institute for Educational Research

Lasonen, J. and Young, M., eds. (1998) Strategies for achieving parity of esteem in European upper secondary education, University of Jyv skyl Institute for Educational Research

Lave, J. (1993) 'The practice of learning' in Chaiklin, S. and Lave, J., eds. Understanding Practice: Perspectives on Activity and Context, London, Cambridge University Press

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

McNamara, G. (1991) Theory and Practice of Transition Education (unpublished PhD Dissertation), School of Education Studies, Dublin City University, Ireland

Michaels, S. and O'Connor, M.C. (1990) Literacy as reasoning within multiple discourses: implications for policy and educational reform Paper presented at the Council of Chief State School Officers 1990 Summer Institute, 'Restructuring Learning', 1990

Miller, A. (1996) 'To boldly go ... work experience but not as we know it?' in Miller, A. and Forrest, G., eds. Work experience for the 21st. century, CEI: University of Warwick

Miller, A. and Forrest, G., (1996) eds. Work experience for the 21st. century, CEI: University of Warwick

Miller, A., Watts, A.G. and Jamieson, I. (eds.) (1991) Rethinking Work Experience, Brighton,

Falmer Press

Moore, R. and Muller, J. (1999) 'The Discourse of ÒVoiceÓ and the Problem of Knowledge Identity in the Sociology of Education' in British Journal of Education, 20. 2.189-205.

Oates, T. and Fettes, T. (1997) 'Work experience and key skills' in Forrest, G., (ed.) Work experience for the 21st. century: changing priorities, changing practice, CEI: University of Warwick

Peffers, J., Griffiths, T. and Romain, L. (1997) Health and Safety in European Work Experience: A Teacher's Guide, CEI: University of Warwick

Prawat, R. (1993) 'The value of ideas', Educational Researcher, August- September

Qualifications and Curriculum Authority (1998) Learning from Work Experience. A guide to successful practice London: QCA

Reder, S.(1993) 'Watching the flowers grow: polycontextuality and heterochronicity at work' in The Quarterly Newsletter of the Laboratory of Comparative Human Cognition, 15, pp 116-125

Regini, M. (1995) 'Firms and institutions: the demand for skills and their social production in Europe', European Journal of Industrial Relations, 1. 2. pp: 191-202

Resnick, LB (1987) 'Learning in school and out', Educational Researcher, 16 (9): 13-40

Scarborough, H., Swan, J. and Preston, J. (1999) Knowledge Management and the Learning Organisation: The IPD Report London: Institute of Personnel and Development

Stern, D. and Wagner, D. A., ed. (1999a) International Perspectives on School-to-Work Transition Cresskill N. J., USA: , Hampton Press

Stern, D. and Wagner, D.A. (1999b) 'School-to-Work Polices in Industrialised Countries as responses to Push and Pull' in Stern, D. and Wagner, D. A. International Perspectives on School-to-Work Transition Cresskill N. J. USA: Hampton Press

Usher, R., Bryant, I. and Johnston, R. (1997) Adult Education and the Post-Modern Challenge, London: Routledge

Vickers, M. (1995) 'Employer Participation in School-to-Work Programmes: The Changing Situation in Europe' in Bailey, T., ed. Learning to Work: Employer participation in school-to-work programmes Washington, DC: Brookings Institute

Vygotsky, L. (1978) Mind in Society The development of higher mental processes Cambridge MA: Harvard University Press

Watts, A.G. (1983) Work Experience and Schools, London, Heinnemann

Watts, A.G. (1991) 'The concept of work experience' in Miller, A., Watts, A.G. and Jamieson, I., eds. Rethinking Work Experience, Brighton: Falmer Press

Wellington, J. (1993) The Work Related Curriculum, London, Kogan Page

Wertsch, J.V. (1981) The concept of activity in Soviet psychology, Armonk, New York: M.E. Sharpe

Young, M.F.D. (1998) The Curriculum of the Future, London, Falmer Press

Young, M.F.D. and Lucas, N. (1999) 'Pedagogy and learning in further education', in Mortimore, P. (ed.), Understanding pedagogy and its impact on learning, London: Sage Publications